

Functional disability in elderly with dementia

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Abstract: Introduction: Dementia represents one of the major causes of disability and dependence in old age and can affect functional capacity in all areas of occupational performance, including basic and instrumental activities of daily living (BADL and IADL, respectively), leisure, social participation and others. Objectives: To characterize the functional disability level in elderly people with dementia and verify the existence of correlation between functionality and the stage or type of dementia. Method: Quantitative, exploratory, cross-sectional study, with a sample of 25 caregivers of elderly with dementia. For the characterization of the participants were used structured questionnaires and to assess functional disability, the Disability Assessment Scale for Dementia - DAD was applied. Results: Greater incapacity was observed in the IADL sub item. This finding is compatible with the literature on the hierarchy in functional decline in the elderly: decline begins in IADL, while BADL remain unaffected for a longer period. There was no significant correlation between the type of dementia, age or gender and disability. It was verified through the Spearman coefficient ($\rho = 0.87$), a significant correlation of high magnitude between functional disability and stage of dementia ($p = 0.0001$). Conclusion: Such findings reiterate the importance of giving priority to early detection and prevention of the functional decline, which is the manifestation of vulnerability among the elderly.

Keywords: *Elderly, Dementia, Everyday Activities, Disabled People.*

Incapacidade funcional de idosos com demência

Resumo: Introdução: A demência corresponde a uma das principais causas de incapacidade e dependência na velhice e pode repercutir na capacidade funcional em todas as áreas de desempenho ocupacional, incluindo as atividades básicas e instrumentais de vida diária (ABVD e AIVD), o lazer, a participação social e outras. Objetivos: Caracterizar o nível de incapacidade funcional de idosos com demência e verificar a existência de correlação entre a funcionalidade e o estágio ou tipo de demência. Método: Estudo quantitativo, exploratório, de corte transversal, com amostra constituída por 25 cuidadores de idosos com demência. Para a caracterização dos participantes foram utilizados questionários estruturados e para avaliação da incapacidade funcional, a Escala de Avaliação de Incapacidade em Demência – DAD (Disability Assessment for Dementia) foi aplicada. Resultados: Identificou-se maior incapacidade no subitem AIVD. Tal achado é compatível com a literatura que discorre sobre a hierarquização do declínio funcional em idosos, iniciando-se pelas AIVD, enquanto as ABVD permanecem preservadas por um período maior de tempo. Não houve correlação significativa entre o tipo de demência, idade ou sexo e incapacidade funcional. Verificou-se por meio do coeficiente de spearman ($\rho = 0,87$), correlação significativa de alta magnitude entre incapacidade funcional e estágio da demência ($p = 0,0001$). Conclusão: Tais achados reiteram a relevância de priorizar a detecção precoce e prevenção do declínio funcional, que representa a manifestação de vulnerabilidade entre os idosos.

Palavras-chave: *Idoso, Demência, Atividades Cotidianas, Pessoas com Deficiência.*

1 Introduction

From the demographic point of view, the proportion of older people in the general population has increased, mainly due to a significant reduction in mortality rates by infectious and chronic diseases, the advancement of medical technology, greater access to health services and improved quality of life (ASSIS et al., 2014; BURLÁ et al., 2013). In Brazil, this process happens in an accelerated way, associated with the expansion of life expectancy of the population and may lead to an increase in the prevalence and incidence of disabling diseases and impairment of functionality (NOGUEIRA, 2010).

Dementias are among the incapacitating diseases of a chronic-degenerative nature, which can be defined as syndromes affecting brain functioning in general, and functions such as memory, reasoning, orientation, comprehension, calculation, learning ability, language, and judgment. It may also affect mood and social behavior (BURLÁ et al., 2013; WORLD..., 2012). At the same time, it is necessary that cognitive and/or neuropsychiatric symptoms affect the ability to work or perform usual activities and trigger a decline in the previous levels of functioning and performance to establish the diagnosis of dementia (FROTA et al., 2011).

The dementia syndrome, whose prevalence increases with age, corresponds to one of the main causes of incapacity and dependence in old age, causing the need for constant care during the disease. The predominant type of dementia is Alzheimer's Disease (DA) accounting for 60% to 70% of cases, followed by Vascular Dementia (DV), Lewy Body Dementia (DCL) and Frontotemporal Dementia (DFT) (BURLÁ et al., 2013).

The cognitive impairment may interfere with an individual's ability to understand and integrate information, which is necessary for the activities of daily living. Thus, the elderly with dementia may have greater difficulties in making decisions, planning and performing individual tasks, associating information, among others. Changes in cognitive functions are also related to the restriction of social participation, which may favor situations of isolation and depression (PURSER et al., 2005).

In this way, the cognitive dysfunction can negatively affect functional capacity in all areas of the individual's occupational performance, including basic activities of daily living (ABVD), such as bathing, dressing and feeding, instrumental activities of life (AIVD), how to administer medicines, pay bills and perform household tasks, rest and sleep,

education, work, play (for children), leisure and social participation (AMERICAN..., 2015).

Older people who have functional decline usually need care from others. This care may be classified as informal or formal, informal care provided by families, friends and/or neighbors, and formal care provided by specialized professionals (CAMARANO; MELLO, 2010). According to Giacomini, Uchoa and Lima-Costa (2005), informal caregivers come from family relationships almost always weakened by the presence of the disease, requiring different organization and family dynamics to correspond to the needs of the dependent person. Because they are in a continuum personal and family relationship, caregivers are often confronted with conflicting feelings about caregiving, family, care activities, and their care (NERI, 2010). Studies point to negative consequences of caring for the physical and mental health of caregivers, such as imbalance between activity and rest, and individual coping strategies compromised, and the time in years that the caregiver exercises the care function is associated with the level of impact (FERNANDES; GARCIA, 2009; GARRIDO; MENEZES, 2004).

The International Classification of Functioning, Disability, and Health (CIF), created by the World Health Organization (WHO), correlates functionality and disability with health conditions, considering the functions of body organs or systems and structures, activities and social participation in the environment where the person lives. Also, it enables the identification of what a person is capable or not to perform in their daily life (FARIAS; BUCHALLA, 2005).

Regarding the concepts of functionality and disability, it has been found that functionality covers the positive or facilitating aspects of the interaction between an individual and his contextual factors, considering body functions and structures, activities, and participation. On the other hand, the term disability refers to deficiencies or changes in body functions and structures, activity limitations, participation constraints, and the magnitude of barriers to environmental factors, translating into negative aspects of the interaction between an individual and their contextual factors. In this way, the CIF understands the incapacity as a result of the interaction of several factors and not as a personal attribute (FONTES; FERNANDES; BOTELHO, 2010). From the epidemiological point of view, disability is usually measured by reporting total dependence or need for help to perform ABVD and AIVD (FREEDMAN; MARTIN; SCHOENI, 2002).

Several scales have been used to evaluate the performance of elderly people in activities of daily living (AVD). Among them, the Disability Assessment for Dementia (DAD), based on the health model proposed by the WHO and developed by Gauthier and G elinas, in 1994, to measure the performance of elderly people with dementia in AVD (BAHIA et al., 2010; CARTHERY-GOULART et al., 2007; G ELINAS et al., 1999).

The evaluation of AVD in patients with dementia offers advantages such as obtaining information about conditions, abilities, and limitations that are not commonly evaluated in clinical practice, assisting in diagnostic accuracy, evaluating the effect of medications, helping to determine the prognosis, and evaluating the need for care. The establishment of stages of incapacity or severity of the disease can help to estimate the need for support for families and to more broadly estimate and encourage the production of public health and social policies, as well as institutional and service care (CARTHERY-GOULART et al., 2007).

Therefore, the objective of this study was to characterize the level of functional disability of elderly people with dementia and to verify the existence of a correlation between the functionality and the stage or type of dementia.

2 Method

This is a quantitative, exploratory, cross-sectional study, developed in an outpatient clinic of the Hospital das Cl nicas of Belo Horizonte, Minas Gerais.

2.1 Sample

The sample was defined by convenience and consisted of 25 family caregivers of elderly people with dementia, assisted at the outpatient clinic. Caregivers should assist the elderly with the following characteristics: a) residing in the community and b) having a diagnosis of Alzheimer's Dementia, Vascular Dementia, Mixed Dementia, Frontotemporal Dementia or Dementia with Lewy Bodies, according to the Diagnostic and Statistical Manual of Mental Illness - DSM-V (AMERICAN..., 2014). Elderly patients with primary motor deficits and/or previous psychiatric disorders were excluded.

This study complies with international standards for human being research, and it has been approved by the institution's Research Ethics Committee (protocol 334/06). All the attending caregivers were

informed about the purpose of the study and signed the Informed Consent Term (TCLE).

2.2 Data collection instruments

Structured questionnaires were used for the characterization of the elderly and caregivers, which raised socio-demographic data, such as age, gender, education, marital status, income and relationship, as well as data regarding the follow-up time in the service, assistance or not by other health professionals, access to guidelines on dementia, among others. Data on the type of dementia and stage of the disease, classified by the Clinical Dementia Rating - CDR, were collected in the medical records. The CDR evaluates cognition and behavior, as well as the influence of cognitive losses on the ability to adequately perform activities of daily living. This instrument is divided into six cognitive-behavioral categories classified in: 0 (no change); 0.5 (questionable); 1 (mild dementia); 2 (moderate dementia); And 3 (severe dementia). The final classification of the CDR is obtained by analyzing these classifications by categories, following a set of rules elaborated and validated by Morris (1993 apud MACEDO MONTA O; RAMOS, 2005, p. 914).

Subsequently, the Disability Assessment For Dementia (k DAD) was applied. All the questionnaires and the DAD were answered by the caregivers. DAD aims to quantify functional abilities in AVD for individuals with cognitive deficits, such as dementia, and to qualify the cognitive dimensions of disabilities in AVD, evaluating them in executive functions: initiative, planning, organization and effective performance. The scale includes the evaluation of basic and instrumental activities of daily living, and leisure (CARTHERY-GOULART et al., 2007; G ELINAS et al., 1999). The DAD has 17 items that measure changes in the ABVD and 23 items for AIVD and leisure activities. The ABVD are evaluated in sub-domains: hygiene, dressing, continence and feeding. The subdomains of AIVD and leisure activities are meal preparation, telephone use, out-of-home activity, finances and correspondence, medication and leisure, and household chores (ARRIGHI et al., 2013).

Each DAD item should be answered as "yes" (1 point), "no" (0 points) or "could not do it/never did it" (N/A). The "yes" indicates that the person performed the activity unassisted or unremembered in the last two weeks, even though this occurred only once during that time. The "no" means that the person did not perform the activity without help (verbal or physical) or without being reminded.

If the item is rated “N/A” because, for example, the person has never done the activity before or has not had a chance to perform it in the last two weeks, it is not considered. The total score is obtained by summing the points for each item and converting it in percentage by a total of 100%. Higher scores represent less disability in AVD, while low scores indicate more dysfunctions (GÉLINAS; GAUTHIER, 1994).

In the initial study, DAD demonstrated a high degree of internal agreement (0.96), inter-examiner (0.95) and test-retest (0.96) (GÉLINAS et al., 1999). The scale was translated, adapted and validated for use in Brazil, reaching correlation coefficients of 0.929 and 0.932 in the inter and intra-examiner evaluations respectively. The reliability indices were also high (Kappa=0.72, $p<0.001$ inter-examiner and Kappa=0.85, $p<0.001$ intra-examiner) (BAHIA et al., 2010; CARTHERY-GOULART et al., 2007).

2.3 Data collection procedures

Caregivers were approached before or after the medical appointment at the outpatient clinic. The study was presented with its objectives and the way in which the data collection would take place. The instruments were applied individually and mostly personally in a single meeting. It was necessary to finalize two data collections by telephone, due to the restriction of time by the participants. The collections took an average of 25 minutes. The need for a reserved environment was respected. The collection period was extended from December 2014 to February 2015, protecting the periods of the recess of the service.

2.4 Data analysis

Simple descriptive statistics were used (measures of frequency and percentage, the central tendency - mean - and variability - amplitude and standard deviation) to show the results regarding the clinical and demographic aspects and the scores of the scales. The Spearman correlation test was performed to evaluate the association between the type of dementia, its stage and the total DAD score (functionality). A 5% α was considered for statistical significance.

3 Results

The total sample of the study consisted of 25 family caregivers, all female (100%) and with a mean age of 53.28 ± 12.21 years old, being the minimum age 26 and maximum 78 years old. Prevalence

of caregivers aged 50 or older (64%) is observed. The elderly caregivers corresponded to 20% of the sample. Table 1 presents other demographic characteristics of caregivers.

The number of caregivers who did not exercise gainful activity was predominant in the sample (60%). Caregivers who have an individual income of a minimum wage correspond to 44%, and from two to five minimum wages to 36%. The most prevalent benefits received were retirement and pensions, with 8% of the sample receiving both concomitantly and 56% receiving none of them. Most of the caregivers who work (36%) care for the elderly in the early or intermediate stages of dementia.

It was found that 80% of the caregivers cohabit with the elderly caregiver and the rest share the care with other relatives mainly in the morning and afternoon. Regarding the time spent in the care of the elderly, most caregivers (68%) have been caring for 1 to 5 years. The care provided less than 1 year ago and for more than 10 years had an equivalent distribution (12% each). Caregivers who care for the elderly for 6 to 10 years were a minority, corresponding to 8% of the sample.

There were 56% of the total number of caregivers stating they received guidelines related to the necessary care for the elderly with dementia and they were provided primarily by doctors, occupational therapists, and professionals from primary health units.

The average age found among the elderly was 80.28 ± 5.33 years old, with 79.72 ± 5.92 years old

Table 1. Demographic data of caregivers.

	n (%)
Marital status	
Single	6 (24%)
Married	12 (48%)
Divorced/Separate	4 (16%)
Widow	3 (12%)
Education	
Illiterate	2 (8%)
Incomplete Elementary	9 (36%)
Complete Elementary	3 (12%)
Incomplete High School	1 (4%)
Complete High School	8 (32%)
Incomplete Higher Education	1 (4%)
Complete Higher Education	1 (4%)
Relationship	
Brother/Sister	2 (8%)
Son/Daughter	18 (72%)
Wife/Hasband	4 (16%)
Grandson/granddaughter	1 (4%)

for women and 81.71 ± 3.30 years old for men. The demographic characterization of the elderly is described in Table 2.

Most elderly patients (88%) started out at the geriatrics clinic in a period of 1 to 5 years, and 80% of all the elderly in the sample are not being followed up by other health professionals besides doctors. Among the professionals who accompany the elderly, there are occupational therapists, physiotherapists and speech therapists.

Data on the types and stage of dementia presented by the elderly are described in Table 3. No elderly of the sample had a diagnosis of Lewy Body Dementia.

Tables 4 and 5 describe the performance of the elderly in each item of the DAD, detailing them regarding the initiative, planning and organization, and effective performance within the ABVD, AIVD and leisure activities.

Table 2. Demographic data of the elderly with dementia assisted by caregivers.

	Women n (%)	Men n (%)
Gender	18 (72%)	7 (28%)
Marital status	4 (16%)	-
Single		
Married	5 (20%)	5 (20%)
Divorced/Separate	-	1 (4%)
Widow	9 (36%)	1 (4%)
Education	6 (24%)	1 (4%)
Illiterate		
Incomplete Elementary	11 (44%)	5 (20%)
Complete Elementary	-	1 (4%)
Complete High school	1 (4%)	-

Table 3. Type and stage of dementia.

	Women n (%)	Men n (%)	Total n (%)
Dementia type			
Alzheimer's dementia	15 (60%)	3 (12%)	18 (72%)
Vascular Dementia	-	1 (4%)	1 (4%)
Mixed Dementia	3 (12%)	2 (8%)	5 (20%)
Frontotemporal Dementia	-	1 (4%)	1 (4%)
Dementia stages			
CDR 1	5 (20%)	1 (4%)	6 (24%)
CDR 1-2	2 (8%)	-	2 (8%)
CDR 2	6 (24%)	5 (20%)	11 (44%)
CDR 2-3	-	1 (4%)	1 (4%)
CDR 3	5 (20%)	-	5 (20%)

Within the ABVD, there is a greater predominance of "yes" responses to the initiative. "N/A" answers only appear in planning and organization. The ABVD that most of the elderly performed independently were "took off all clothing" (88%) and "tried to get dressed" (84%). The sub-item "washed and dried" was the only one in which there was a predominance (56%) of the "no" response, evidencing the need for assistance to perform these activities.

Table 5 shows a predominance of "no" responses, evidencing more impairment in AIVD compared to ABVD. In the item "adequately conversed on the phone" - effective performance, there was an equivalence between "yes" and "no" answers (44%).

The average of the total DAD score was 42.8%, with 0% being the minimum score and 90.9% the maximum score in the test. Regarding the ABVD score, the elderly presented a better performance, obtaining an average of 63.9%, with a maximum of 100%. The performance of the AIVD was lower than the ABVD, with a total average of 23.9% and a maximum of 81.25%. In all cases, the minimum average was 0%.

There was no significant correlation between the type of dementia, age or gender, and functional disability, as measured by total DAD score. The high magnitude significant correlation between functional disability and the dementia stage ($p=0.0001$) was found by Spearman's coefficient ($\rho=0.87$), as described in Table 6.

4 Discussion

In this study, the total of the sample of caregivers belongs to the female gender. Among them, 72% of caregivers were daughters, and 16% were married to the elderly, and 48% were married. The results are in line with the research carried out with this public, which affirms that, historically, the caring activity has been predominantly female, both in the family context and in paid work, and in general, the informal care offered to the elderly with some degree of dependence is provided by the wives or daughters (CAMARANO; MELLO, 2010; MOREIRA; CALDAS, 2007; GIACOMIN; UCHOA; LIMA-COSTA, 2005).

According to Camarano and Mello (2010), informal home care predominates around the world, corresponding to about 80% of the care of elderly people with a functional capacity loss in Organization for Economic Cooperation and Development (OECD) member countries.

Table 4. Performance of the elderly people in ABVD-DAD.

	Question	Yes n (%)*	No n (%)*	N/D n (%)*
Hygiene				
Initiative	They tried to wash himself	(60%)	(40%)	-
Initiative	They tried brushing teeth or dentures	(56%)	(44%)	-
Initiative	They tried to take care of the hair	(64%)	(36%)	-
Planning and organization	They prepared the shower.	(52%)	(44%)	(4%)
Effective performance	They washed and dried	(44%)	(56%)	-
Effective performance	They brushed the teeth	(52%)	(48%)	-
Effective performance	They looked after her hair	(60%)	(40%)	-
Dressing up				
Initiative	They tried to dress	(84%)	(16%)	-
Planning and organization	They chose his clothing	(44%)	(48%)	(8%)
Planning and organization	They dressed in the right order	(64%)	(36%)	-
Effective performance	They fully dressed up	(64%)	(36%)	-
Effective performance	They took off all the clothes	(88%)	(12%)	-
Continence				
Initiative	They decided to use the bathroom	(68%)	(32%)	-
Effective performance	They used the bathroom	(60%)	(40%)	-
Feeding				
Initiative	They decided to eat	(76%)	(24%)	-
Planning and organization	They chose the right cutlery and seasoning	(56%)	(36%)	(8%)
Effective performance	They ate at a normal pace	(76%)	(24%)	-

*percentage of questions answered with yes, no and N/D (never did it or did not have the opportunity), respectively.

It was also observed that 64% of the caregivers are 50 years old or older, and the number of elderly caregivers was 20%. These results differ from the study by Moreira and Caldas (2007), who affirm that most of the time, the age group of the caregivers belongs to the same generation of the people they take care, that is, they are elderly caregivers caring for other elderly people.

Regarding the marital status of the elderly with dementia assisted by the caregivers, 20% of the men are married, while 36% of the women are widows. The data are in line with the study by Camarano and Mello (2010), where they state that most elderly

dependent men are married, which is not the case with women, who are predominantly widows. According to the authors, this picture is experienced worldwide and occurs because of the longer life expectancy of women and less likely to remarry.

This study evidenced 36% of caregivers having incomplete elementary education and 32% complete high school education. Regarding the elderly with dementia assisted by caregivers, there was a predominance of those with incomplete elementary education, being 44% female and 20% male. The percentage of illiterate elderly women was considerable (24%) compared to men (4%).

Table 5. Performance of the elderly people in the AIVD-DAD.

	Question	Yes n (%)*	No n (%)*	N/D n (%)*
<i>Meal preparation</i>				
Initiative	They tried to prepare a meal	10 (40%)	14 (56%)	1 (4%)
Planning and organization	They planned a meal	8 (32%)	16 (64%)	1 (4%)
Effective performance	They cooked a meal	8 (32%)	16 (64%)	1 (4%)
<i>Use of telephone</i>				
Initiative	They tried to call	2 (8%)	19 (76%)	4 (16%)
Planning and organization	They found and dialed a number	2 (8%)	15 (60%)	8 (32%)
Effective performance	They talked properly	11 (44%)	11 (44%)	3 (12%)
Effective performance	They wrote and communicated messages	5 (20%)	16 (64%)	4 (16%)
<i>Activity outside the home</i>				
Initiative	They decided to go out	7 (28%)	18 (72%)	-
Planning and organization	They organized their way out	2 (8%)	22 (88%)	1 (4%)
Effective performance	They went out and found a family destination.	3 (12%)	20 (80%)	2 (8%)
Effective performance	They used transport safely	1 (4%)	21 (84%)	3 (12%)
Effective performance	They returned from the store with the appropriate items	1 (4%)	18 (72%)	6 (24%)
<i>Finance and correspondence</i>				
Initiative	They were interested in personal matters	10 (40%)	13 (52%)	2 (8%)
Planning and organization	They organized their finances	-	19 (76%)	6 (24%)
Planning and organization	They organized their mail	1 (4%)	17 (68%)	7 (28%)
Effective performance	They handled with change	3 (12%)	17 (68%)	5 (20%)
<i>Medications</i>				
Initiative	They decided to take the medication	2 (8%)	22 (88%)	1 (4%)
Effective performance	They used measurement as prescribed	1 (4%)	23 (92%)	1 (4%)
<i>Leisure and homework</i>				
Initiative	They were interested in leisure activities	8 (32%)	17 (68%)	-
Initiative	They were interested in domestic activities	13 (52%)	12 (48%)	-
Planning and organization	They planned and organized household activities	8 (32%)	16 (64%)	1 (4%)
Effective performance	They completed household activities	7 (28%)	18 (72%)	-
Effective performance	They stayed home safely	10 (40%)	11 (44%)	4 (16%)

*percentage of questions answered as yes, no and N/D, respectively.

Table 6. Correlation between functional disability and the type or stage of dementia.

		Functional Disability (DAD)
Type of dementia	Coefficient of correlation	-0.075
	p-value	0.722
State of dementia	Coefficient of correlation	-0.866**
	p-value	0.0001

**p<0.001.

This fact is justified due to the social context in which the elderly population of the study grew up, in which the women did not have participation in the educational places and had even less attendance to the school, prioritizing the work to the detriment of the education (MASTROENI et al., 2007).

According to the Brazilian Institute of Geography and Statistics - IBGE (INSTITUTO..., 2013), in Brazil, besides to the low education, there is still a significant number of illiterates, concentrated in the population over 55 years old (56%) according to data collected in 2012. In 2002, 45% of illiterates were in this age group. These results point to the progressive aging of the illiterate population, evidencing the growing difficulty of altering this situation due to obstacles to access to education that become ever greater with advancing age, physical limitations, demotivation, diseases, among others. Neri (2010) also reports that factors such as low education, age, female gender and low income significantly affect fragility conditions and correlate with cognitive deficit.

As expected, the mean DAD score in the ABVD sub-item was higher (63.9%) than in the AIVD sub-item (23.9%). That is, the elderly had a greater inability to perform the AIVD than the ABVD. Mendes and Novelli (2015) presented similar results, since the elderly presented 66.27% independence in the ABVD and 52.18% in the AIVD. In a study, Marra et al. (2011) found that the functional performance in the AIVD evaluated by the Lawton and Brody Index presented great weight to determine the severity of dementia, suggesting that the performance of the AIVD is an important variable in differentiating the stages of dementia. These results are consistent with the literature findings that address the hierarchy of functional decline in the elderly, including those with some form of dementia, stating that AIVD is compromised in the early stages of the disease, while ABVD remains intact until the severe cognitive impairment. However, it is known that

the individual progression of the disease is variable and that the order of performance impairment in different tasks, such as those measured by DAD, may vary from patient to patient (ARRIGHI et al., 2013; TOZLU et al., 2014).

In this study, the elderly had a greater commitment (greater number of “no” answers) in the sub-items: “used medication” (92%), “their organized their way out” (88%), “they used transportation safely” (84%), “they decided to take medication” (88%) and “they went out and found a destination” (80%), that is, in AIVD. In agreement with the study, Arrighi et al. (2013) found that the activities in which elderly people with dementia had the greatest disability were, specifically: taking care of finances, administering medications and performing activities outside the home. Similarly, Mendes and Novelli (2015) found greater impairment in AIVD. However, there was a predominance of leisure and home activities (62.67%) and telephone use (61.82%).

Hauber et al. (2014) investigated the importance of maintaining the ability of the elderly with DA to perform 10 daily life activities corresponding to the DAD domains, from caregivers in the United States and Germany. In both countries, preserving the skills of using the bathroom without accidents was the most important, and managing the money was the less important. Also, three of the five activities listed as most important to maintain were ABVD (use the toilet without accidents, feed themselves and wash and dry the body thoroughly). The four least important activities for caregivers were AIVD (finding a family destination, talking on the phone, preparing a meal, and managing money). Such findings suggest that caregivers in both countries are more concerned with preserving the abilities of older people to perform ABVD than with AIVD. Therefore, understanding their preferences may provide greater insight into the effects of DA and their treatments, as well as indicating the need to develop assessments considering the caregiver's preference. In the research, the reason for the caregiver's preference was related to the feeling of sadness by the elderly when they lost such abilities and with the demand of a greater effort by the caregivers to take care of the patient (HAUBER et al., 2014).

The fact that the AIVDs are the first to be affected by dementia and are relatively less important to some caregivers than the ABVD, according to Hauber et al. (2014), points to the need to target interventions related to the management of expectations and impact of functional decline in caregivers, as well as to the maintenance of ABVD and/or activities they consider important to be preserved. It is known

that lower functional capacities have been associated with increased overload in caregivers of patients with dementia (HAUBER et al., 2014).

Regarding the executive functions, the findings of the study showed that there was a predominance of elderly people who have the initiative to perform the ABVD. Regarding planning and organization, most elderly did not have the opportunity or never performed such steps of the basic activities of daily living. The “wash-and-dry” activity was the only ABVD in which most of them (56%) were not able to perform alone, corresponding to the executive function of effective performance. The performance of the AIVDs was predominantly compromised in the sample, both for the initiative, planning, and organization, as well as for the effective performance of tasks. According to Paula and Malloy-Diniz (2013), executive functions predict the functional performance of the elderly. Hauber et al. (2014) also point out that there is no well-defined correlation between the ability to perform an activity and its ability to initiate or plan it.

No correlation was found between age or gender and functional disability measured using the DAD score. The hypothesis raised to justify this result is the composition of the sample constituted only by elderly people with dementia, and it is possible that in this case, the health condition has become preponderant. However, in the general population of the elderly studied by Giacomini et al. (2008), the age group ≥ 80 years old had a strong association with functional disability.

There was also no correlation between the type of dementia and the level of functionality of the elderly. This finding may be related to the reduced number of the sample, as well as to the predominance of elderly patients with DA diagnosis (72%) than other types of dementia. However, Bouwens, Van Heugten and Verhey (2009), using other assessment tools, found a statistically significant correlation between cognition (Mental State Mini Examination - MMSE) and Blessed Dementia Scale (BDS) for most types of dementia, except Primary Progressive Aphasia. These authors found greater impairment in the functionality of patients with dementia related to Parkinson's disease (PD), followed by patients with Vascular Dementia, Alzheimer's Dementia, Frontotemporal Dementia and, finally, Primary Progressive Aphasia.

Statistical analysis verified a significant correlation of high magnitude ($p=0.0001$ for $\rho=0.87$) between functional disability and the stage of dementia, and the higher the CDR, the lower the score. That is, the more advanced dementia, the greater the level

of functional disability of the elderly. The study by Marra et al. The study by Marra et al. (2011) points out that the performance in the Mental State Miniexame (MMSE), advanced age and functional performance in ABVD and AIVD were significantly associated with the three levels of dementia classification (CDR 1, 2 and 3). However, in this study, there was no correlation between disease progression and educational level, gender or diagnosis of depression. Arrighi et al. (2013) also found a correlation between cognitive and functional decline, indicating that the loss of one point in the MMSE score was associated with at least three points in the DAD.

Finally, in this study, as reported by Arrighi et al. (DAD) scores in elderly patients with advanced dementia reached ground effects, indicating the need to develop other functional measures that may be useful to properly characterize the functional status of patients with advanced dementia, as well as to help decisions about assistance and care to be provided.

5 Conclusion

The findings of this study evidenced the correlation between the dementia stage and functional disability, confirming the existence of functional decline as the disease progresses. It was also possible to verify the hierarchical process of this decline, initiated by the impairment of the performance of the AIVD, followed by the ABVD. No correlation was found between the type of dementia and the level of functional disability, a topic that needs subsequent investigations, considering the impact that can cause in the interventions with different populations, besides being still little explored in the literature.

Given the significant number of elderly with functional disability, it is clear the importance of prioritizing early detection and prevention of functional decline, which represents the manifestation of vulnerability among the elderly. It is also worth mentioning the need for more research related to the theme to enable the planning of interventions directed to the specific needs of the elderly and caregivers, as well as favoring the production of public and institutional policies that benefit this group.

The results of the study cannot be generalized to the entire Brazilian population since it consisted of a small sample composed only of the elderly attending a regional health service. It is evidenced the need to develop population studies with similar objectives to verify the possible relationship between the types of dementia and the functional incapacity.

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Author's Contributions

Tainá Alves Fagundes was responsible for the elaboration of the study, collection, descriptive analysis of the data and writing of the text. Marcella Guimarães Assis was responsible for the guidelines and review of the text. Danielle Aparecida Gomes Pereira was responsible for the statistical analysis of the data and final review of the text. Kátia Maria Penido Bueno was responsible for the suggestions and review of the text. All authors approved the final version of the text.

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