


DEMENTIA AND ITS FUNCTIONAL AND COGNITIVE

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Vinicius Fabel Urbinati¹, Jhonata Marcos Ferreira² and Maysa Alahmar Bianchin³

ABSTRACT

Introduction: The diagnosis of dementia has increased in recent decades, being a relevant cause of cognitive and functional impairments in the population. However, the national literature on this relationship is extremely scarce. **Objective:** To analyze quantitatively and qualitatively the associations that exist between the variables dementia and cognitive and functional impairments. **Methods:** A systematic review of studies on the subject was carried out in the electronic databases Pubmed/Medline, Science Direct, Scielo, and Google Scholar in 2024. Finally, the synthesis of the study was through the comparison of qualitative and quantitative quantities, determining the most frequent characteristics. **Results:** Dementia constitutes a syndrome of great clinical variability, but always culminating in cognitive decline, in the most comprehensive areas, which leads, in the progression of the disease, to the impairment of the patient's functionality in daily activities of life, and, consequently, in their autonomy, affecting the quality of life. Early diagnosis and prevention are extremely important to maintain autonomy, as is attention to the caregiver. **Conclusion:** Dementia significantly affects the quality of life of patients and caregivers, as it causes a significant decline in the individual's functionality and autonomy.

Keywords: Dementia. Cognitive impairment. Functional impairment.

¹ Graduated in Medicine
São José do Rio Preto School of Medicine (FAMERP)
vinicius.fabel@gmail.com
0009-0008-7451-8669
7856390586004845

² Graduated in Medicine
São José do Rio Preto School of Medicine (FAMERP)
jhonatamf@gmail.com
0009-0006-2991-5636
6834819165589029

³ Professor, Doctor and Occupational Therapist
São José do Rio Preto School of Medicine (FAMERP)
maysa@famerp.br
0000-0002-8313-8675
7946429676296074

INTRODUCTION

Dementia can be defined as an acquired and irreversible disorder characterized by a significant decline, and therefore affecting independence, in one or more cognitive domains, compared to the previous level of function, such as learning and memory, language, executive function, complex attention, perceptual-motor, and social cognition [1,2,3]. It is worth noting that, for diagnosis, the Diagnostic and Statistical Manual of Mental Disorders (DSM) requires only a substantial decline in a single cognitive area [1,3], even though, in clinical practice, a decline in at least two cognitive domains is often required for this [3], with memory decline being the priority. Dementia is the most common and most severe type of impairment of cognitive function.

Most dementia is caused by a neurodegenerative disease, with Alzheimer's disease (AD) being the most common form of dementia in the elderly, responsible for 60 to 80 percent of cases [3,4]. Other conditions include: Dementia with Lewy bodies (DLB), Frontotemporal dementia (FTD), Parkinson's disease dementia (PDD) (neurodegenerative) [3,5,6,7], and Vascular dementia (non-neurodegenerative), the progression of which can be slowed or halted if the underlying cause is identified and treated [3,8].

As the world's population ages, the prevalence of dementia is expected to increase significantly, especially in low- and middle-income countries. It is expected that by approximately 2050, around 152 million people will have dementia [9,10]. This impact is notable in our country, and by 2025, Brazil is expected to be the sixth country in terms of the number of elderly people [11,12], in 2015, approximately 800,000 people were already estimated to be living with dementia in Brazil [9,13].

Dementia is one of the main causes of disability in the elderly, with significant impacts on the autonomy and quality of life (QoL) of people with dementia and their families [9]. In addition to the decline in QoL, in the 2016 Global Health Estimates of the World Health Organization (WHO), deaths due to dementia more than doubled between 2000 and 2016, elevating the disease to the fifth leading cause of death in the world in 2016 [11,14]. In Brazil, AD was among the 10 leading causes of death in 2019 [9,15]. In addition to dementia itself, medical illnesses and comorbidities that exacerbate cognition are common in elderly patients, such as heart and kidney failure [3], making the therapeutic approach in these patients even more difficult. It is clear, therefore, that primary health care is essential for the care of elderly people with dementia. A multidisciplinary approach is necessary to act preventively, diagnose early stages, and improve quality of life in advanced stages since it is a disease with very

limited course-modifying therapy (the success of treatment is often measured by the improvement in the individual's quality of life) [16,17,18]. For this action to be effective, these professionals must be able to recognize and act on the functional and cognitive impairments of dementia, thus motivating the Literature Review of this work.

METHODOLOGY

The systematic review in question is based on the terms of PRISMA, Preferred Reporting Items for Systematic Reviews and Meta-Analyses. And, its strategy was to determine dementia and the functional and cognitive impairments caused.

The searches were conducted in the electronic databases Pubmed/Medline, Science Direct, Scielo, and Google Scholar in 2024. "Functional impairment from dementia" and "cognitive impairment from dementia" were used, as well as the same terms translated into Portuguese, which will be applied in the electronic searches. Other descriptors used will be "dementia", "functionality", "cognition", "prognosis", "evolution" and "quality of life". The articles were selected by reading the title and abstract written by two independent authors, with duplicates subsequently excluded. After selection, the articles were read in full, based on the inclusion criteria.

The sample will include observational studies that present data on the functional and cognitive impairments of the pathology in question in patients from all over the world. Study participants will be adult patients, preferably over 50 years of age, who have proven dementia or pre-dementia. Studies published in Portuguese, Spanish, or English, occurring in the national territory. Studies, articles, book chapters, and conferences that did not meet the criteria were excluded.

Finally, the study was summarized by comparing qualitative and quantitative measures to determine the most frequent characteristics.

RESULTS AND DISCUSSIONS

Population aging is associated with numerous pathologies whose importance is centered on physical or mental incapacity. Mental they generate, causing great individual, social, and economic impact [19,20]. Increasing age is generally associated with cognitive changes that may or may not be part of the natural evolution of senescence, and can range from mild changes to severe dementia [21].

Cognition, in turn, encompasses all human intellectual functioning, from the sensory perception of the environment, information processing, involving memories, experiences, reasoning, attention, and the formation of complex and interconnected knowledge structures, generating decision-making and problem-solving [22]. Dementia can be defined as a clinical syndrome that encompasses several diseases, usually progressive and neurodegenerative, that affect various cognitive functions, such as memory, attention, language, praxis, recognition, understanding, learning ability, calculation, judgment, language, executive and visuospatial function, personality, behavior, and agnosia, significantly interfering with a person's ability to maintain their activities of daily living (basic and/or instrumental) and autonomy, causing impairment and functional loss [19,21,22,23,24,25]. It is generally a significant cause of disability and dependence, mainly among the elderly, causing impacts that encompass not only the individual but also their career, partners, caregivers, family, community, and society [21].

A wide variety of functions can be affected in a dementia syndrome, varying in quantity, intensity, and progression, causing a variety of functional impairments to the individual, and affecting their social and professional performance. There may be a decrease in reasoning speed, sleep impairment, intermittent or sustained episodes of confusion, and psychological changes that result in changes in daily hygiene, eating, dressing, and physiological needs, associated with emotional instability and changes in social behavior and motivation [22]. The Diagnostic and Statistical Manual of Mental Disorders (DSM-5) defines dementia as a syndrome that includes the loss of cognitive functions with impaired functionality, that is, leading to the loss of the ability to perform daily activities for work, social, and family functioning, also encompassing psychological and behavioral symptoms, which may be initial or early manifestations of the syndrome [26, 27, 28, 29]. Historically, the definition was based on memory deficits (as observed in Alzheimer's disease) [30,31], but more recent revisions, such as the revised definition in 2011, bring more importance to the wide variety of cognitive and behavioral changes present in the syndrome that can cause a decline in baseline levels of functioning [30,32]. The most recent revised definition requires impairments in at least two neuropsychiatric or cognitive domains, not better explained by primary psychiatric disorders or systemic conditions such as delirium [30].

Dementia can be caused by a heterogeneous group of disorders, making etiological diagnosis difficult, the most common being Alzheimer's disease and vascular dementia [21].

Medical care is often sought when family members or close associates notice minor cognitive changes, most commonly related to short-term memory problems, such as forgetting where to put things that are commonly used at home or forgetting recent conversations, which begin to interfere with the ability to function adequately in daily life. It is also common to seek care initially due to psychological or behavioral changes, such as withdrawal from hobbies or social events, anxiety, or depression. Another common manifestation at the beginning of the condition is changes in executive function leading to difficulty in performing daily tasks such as driving [25]. It is important to consider the individual's decline in their premorbid level of functioning [21,33].

From a more physiological perspective, dementia can be understood as a process that involves several specific molecular pathways that interact with each other, culminating in the loss of synaptic connections, inflammation, cell death, gliosis [30,34], and interruption of functional networks that guide cognition, personality, behavior, and sensory and motor functions, resulting progressively in loss of individual autonomy [30,35].

Clinical diagnosis is not always easy, given the great variability of cognitive function among the elderly, making it challenging to quantify normative limits in this population [21,33]. This highlights the importance of differentiating between normal age-related changes and pathological conditions.

Among the cognitive changes throughout life, expected from normal aging, we can highlight the decline in fluid intelligence and the preservation and increase in crystallized intelligence [36]. Intelligence Fluid intelligence comprises the speed of mental processing, working memory, recall and retention of verbal and visual information, related to learning and memory, and reasoning, which begins to decline around the age of 20 and 30 [36,37,38]. These changes can affect creativity, abstract reasoning, and learning of new problem-solving skills, resulting in lower speed and efficiency in acquiring and memorizing new information, which translates into a lower learning rate and slower retrieval of information and memories [36]. On the other hand, crystallized intelligence, which is the ability to apply knowledge and procedures learned throughout life, increases, given the accumulation of greater experience. Its best performance can be manifested in specific tests, semantic knowledge, reading, and vocabulary around the age of 50 to 70 [36,37,38]. These cognitive abilities depend on adequate retrieval of stored information, and the loss of this information storage is not considered a normal part of aging [36]. In medical practice, when evaluating a patient with cognitive complaints, whether self-reported or reported by a companion, it is common to come

up with dementia syndrome as a diagnostic hypothesis (HD). However, as discussed, for this diagnosis, a cognitive and/or behavioral decline is required that interferes with activities of daily living, causing functional impairment about previous levels, not explainable by delirium or major psychiatric disorder [39,40]. Before this condition, two conditions can be diagnosed, which may or may not be precedents of dementia syndrome, which are subjective cognitive decline (SCD) and mild cognitive impairment (MCI). DCS is the condition in which the individual presents self-perceived cognitive complaints (mainly memory) but with normal performance in neuropsychological tests and without prejudice to their autonomy in performing ADLs. Similarly, CCL is the condition in which the individual presents a cognitive disorder, but without prejudice to their autonomy in performing ADLs, although changes in neuropsychological tests already occur, and there may be mild problems in performing previously habitual complex tasks. However, it is important to emphasize that the individual is still able to maintain their independence [39,41,42,43,44,45]. It is clear from the above that the diagnosis of DCS and CCL is clinical, involving anamnesis, ideally including a family member or close informant, since the presence of anosognosia is common, and should identify whether there is an impact on the patient's functionality, the cognitive examination, generally using cognitive screening tests, which are structured instruments of brief application that allow a global assessment of cognition, with the Mini-Mental State Examination (MMSE) being the best known and most widely used, which assesses temporal and spatial orientation, memory, attention, calculation, language and constructive skills in approximately 5 to 7 minutes, and the functional assessment [39,46].

In continuing the approach to the patient with HD dementia, in addition to the explicit assessments, it is necessary to pay attention to somatic and neurological changes, such as changes in gait, ocular motility, and primitive reflexes (more observed in severe dementia cases) [39].

The key to assessing cognitive decline, however, is functionality, which helps determine the syndromic diagnosis, as demonstrated above. For a more objective assessment of this topic, validated instruments that are completed based on the informant's answers can be used [39,47]. The most widely used instrument in Brazil is the Pfeffer Functional Activities Questionnaire (QAF), which is simple to use and quick to apply (approximately 7 minutes) [39,48]. For basic activities of daily living (BADLs), the Kartz scale can be used [39,49].

SCD, MCI, and dementia syndromes can often be related, and there may be a continuum of the disease. However, many people with SCD can remain stable or even reverse the condition. This is because not only the initial stages of neurodegenerative diseases are among the causes of SCD; other associated conditions are normal aging itself, personality traits, and psychiatric disorders, for example [39,50].

MCI is recognized as a more heterogeneous and comprehensive entity of clinical presentation, etiology, and prognosis [39,50], and is divided into 4 subtypes, mentioned below: amnesic MCI - single domain, amnesic MCI - multiple domains, non-amnesic MCI - single domain, and non-amnesic MCI - multiple domains. In addition to the subtypes, it also has different possible etiologies: degenerative, vascular, metabolic, and psychiatric, among others [39,51]. Given its characteristics, in 2013, the DSM-5 recognized it as a disorder mild neurocognitive [39].

It is worth remembering that in MCI, cognitive deficits do not interfere with the ability to be independent in ADLs, that is, complex instrumental daily activities are preserved, such as paying bills and controlling medications, but may require more effort or require compensatory strategies. In addition, it is necessary to individualize the functionality and cognitive alteration for the patient in the context of their particular circumstances and premorbid level of function and performance [36,52]. However, compared to controls, they have significantly lower performance and may correspond, in many cases, to an incipient stage of some form of dementia [39,53,54].

Finally, still, on the topic of investigating cognitive complaints, it is emphasized that assessments of cognition, function, and behavior must be personalized and interpreted within the context of the individual's psychosocial history, level of education or intelligence, function, and achievement, primary language, ethnicity, and culture [36].

Health professionals should be alert to complaints that indicate some form of cognitive decline, especially in the elderly, since often, in consultations motivated by other conditions, the patient or their companion may suggest changes in daily instrumental activities of living, such as difficulty taking medications and missing appointments or attending at the wrong time or day, or changes in behavior and mood, such as new depression or anxiety [55].

Along with cognitive decline, 90% of patients with dementia present behavioral and psychological symptoms, including aggression, agitation, anxiety, depression, and psychosis. Dementia-related psychosis (DRP) causes great harm to the individual's functionality and

quality of life for them and their caregivers, including symptoms such as delusions and hallucinations and increasing the severity of the disease [56,57].

DRP can occur in all types of dementia, but studies report the following prevalence rates: Dementia with Lewy bodies (75%); Parkinson's disease (50%); Alzheimer's disease (30%); Vascular dementia (15%) and frontotemporal dementia (10%) [56,58]. Psychotic symptoms in this population often increase the patient's feelings of distress, the number of hospitalizations, and the caregiver's burden.

Hallucinations and delirium in patients with dementia are not easily explained, usually involving psychological, social, biological, neurochemical, neuropathological, and genetic factors [56,59]. Situations that can motivate and contribute to this condition are changes in the patient's environment, caregiver behavior, unmet needs, personal factors such as personality, past experiences, negative feelings, and dementia itself which leads to memory problems and disorientation [56]. When approaching these patients, it is important to demystify the associated stigmas, explaining that these symptoms are part of the disease and that they are not "crazy", and also to emphasize that it is not useful to argue with the patient or try to convince them that their thoughts or sensory impressions are not real, but rather, instead, to try to understand and recognize the patient's emotional reaction and direct it to other aspects or ideas [56].

Addressing the issue of caregivers is very important within dementia syndromes, given the life changes and overload on them, affecting not only the patient's quality of life but also extending to the family caregiver. Much of the burden of the disease falls on family caregivers. In this regard, compassion, patience and a lack of condescension are essential to establish harmony, trust, and expectations. Many patients with dementia have a profound loss of perception about their deficits and limitations, placing even more weight on the family of the diagnosis [60]. Stress-related to the diagnosis can be more dramatic when the patient is under 65 or has dependent children [61], demonstrating the importance of caring for the caregiver so that the patient can be cared for. Factors that affect the quality of life of both include the presence of other comorbidities, physical limitations, hearing limitations, visual limitations, mood disorders, pain disorders, and sleep disorders. In addition, in the social sphere, cultural and environmental factors interfere with the quality of life, such as the composition of the family unit, the challenges of the place of residence, the family's financial situation, or the health of other family members [60].

No less important, it is necessary to discuss and assist in end-of-life decisions that will have to be faced. Health professionals can make these passages through the dementia saga much less painful by being honest and offering empathy, knowledge, and validation of the caregiver's decision-making [60].

The diseases that make up dementia syndrome are irreversible visible and, many, neurodegenerative, with a variable survival rate after diagnosis, ranging from months to decades. As dementia progresses, vegetative functions also end up being affected, with death often resulting from swallowing difficulties, falls, and infections [30]. Therefore, it is necessary to act in the prevention and early diagnosis of dementia. Promoting health throughout life, such as a physically active lifestyle, smoking cessation, and a healthy and balanced diet, demonstrates, in addition to the commonly known benefits of hypertension and diabetes, also prevents or delays the onset of dementia syndromes, as it acts on biological mechanisms that involve the main pathways involved in the development and progression of dementia, such as neurodegeneration, brain resilience, vascular damage, neuroinflammation, and oxidative stress [62]. Systemic atherosclerosis, preventable by the same means, also plays a role in cognitive deterioration in the aging process [62]. The factors that are commonly preventable with lifestyle changes, i.e. cardiovascular risk factors, are also risk factors for dementia. We can mention hypertension, diabetes mellitus, hypercholesterolemia, atrial fibrillation, and smoking. In addition to the aforementioned, another significant and modifiable risk factor is education, with better quality education and teaching meaning better protection against dementia [21].

In the approach seeking early diagnosis, high suspicion should be maintained in older adults who present neuropsychiatric symptoms with an atypical natural history or with first-episode psychiatric symptoms in adult life [55]. Patients already diagnosed with DCS, MCI, or Parkinson's disease should also be closely monitored, due to the risk of developing a dementia syndrome, with the presence of Parkinsonism increasing the chances of developing dementia by three times [55]. Sleep should also always be assessed with a careful history, including assessment of sleep time, insomnia, daytime sleepiness, and naps, which can facilitate the identification of preclinical dementia or high risk of developing dementia [55]. Slower walking speed can be associated with future dementia; population studies have shown that slow walking speed (below 0.8 m/s) can be associated with subjective or objective cognitive impairment [55]. Observational studies have also shown that hearing impairment is associated with the development of dementia [55].

Commonly in the progression of the disease and cognitive decline, leading to functional impairment, there is a limitation of autonomy. The loss of personal autonomy is relevant to the extent that it is an important construction of human dignity. The power to make decisions and have them respected is part of the recognition of an individual as a person within society and to the extent that this right is curtailed, the individual may be nullified as a person in society. Even though dementia affects decision-making abilities, it cannot be considered the immediate reason for determining that a person is incapable of making decisions [63,64].

Being designated as incapable of making decisions has several negative consequences for the patient. It reduces self-esteem, confidence, desire to live, and involvement in health care [63,65]. The will, relationships, and autonomy of older adults with dementia should be valued.

Unfortunately, as has been demonstrated, dementia has several factors that need to be addressed in its prevention, diagnosis, and treatment that are neglected, which impacts the progression of the disease and consequently the functionality and quality of life of patients and caregivers. Dementia is underdiagnosed worldwide, leading to a diagnosis at a late stage in the disease process, and long-term care pathways (from diagnosis to end of life) for people with dementia are often fragmented, if not completely absent [21]. The rights of people with dementia are often violated or denied in the community, an example of which is the frequent exclusion of the patient from decision-making, with their wishes and preferences regarding the care provided not being taken into account. Part of this problem is due to late diagnosis, when individuals are no longer able to participate in this process due to the progression of the disease [21].

Early action and diagnosis with continued treatment enable patients with dementia to receive the care and support they need to face this condition with dignity, respect, autonomy, and equity. The ultimate goal is to improve the quality of life of people with dementia and their families, while at the same time trying to reduce the impact of the disease on the patient, as well as on the communities [21].

CONCLUSION

The main conclusion The findings of this research reveal that, predominantly, dementia significantly affects the quality of life of patients and caregivers, as it causes a significant decline in the individual's functionality and autonomy. To summarize this review, we conclude

with the words of Tedros Adhanom Ghebreyesus (2021), Director-General of the WHO:
“Dementia robs millions of people of their memories, independence, and dignity, but it also robs the rest of us of the people we know and love”.

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