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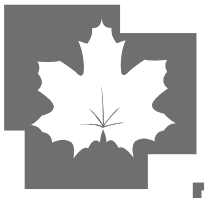

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Focus on the patient is the central pillar of the digital transformation in health!

In 1903, the famous inventor Thomas Edison declared, in one of his many predictions about the future, that "the doctor of the future will give no medicine, but will interest his patient in the care of the human frame, in diet and in the cause and prevention of disease". He saw a long way!

This challenge to health is no surprise to some of us, yet still leaves us perplexed – we must persistently pursue the strategy of disease prevention rather than simply reacting to the treatment of those illnesses which occur and can be avoided. The perfect storm of factors that together make our current health services inaccessible and unsustainable is well known and well understood, given the number of studies published on the subject. Economic, epidemiological and demographic changes mean that the 'more of the same' formula is no longer able to deal with the many serious problems faced by health services in the 21st century[1]. Rising health care costs, consumer expectations, new technologies and increasing globalization have placed huge pressure on the health sector, forcing it to align more closely with the economic constraints that every country suffers.

Established long-term primary, secondary and tertiary care systems are increasingly unable to respond to the challenges arising from aging populations, as well as the shift in the burden of diseases to chronic conditions, such as diabetes and musculoskeletal and cardiovascular diseases.

The need for greater quality and efficiency in health care, not only in hospitals but also in the home, is becoming increasingly important for patients, especially those with chronic conditions, and for societies all around the world. The availability of new technologies, such as smartphones, wearable technology and cloud based electronic medical records, facilitates the development of more flexible and safer technological solutions for patients[2,3].

A recurring question is: will universalized digital medical record systems be able to transform our current health services? Put simply, YES. There are potential benefits for health management, with savings in treatment costs and a reduction in unnecessary spending. What we seek through this digital revolution in health is the virtuous sustainability of the system[4].

The report prepared for the NHS system in the UK, entitled the *Topol Review - Preparing the Healthcare Workforce to Deliver the Digital Future*[5], published in February 2019, includes three principles to support the deployment of these digital technologies in healthcare. These are:

1. Patients should be adequately informed about health technologies, with particular focus on vulnerable groups to ensure fair access;

2. Health professionals need knowledge and guidance to assess and adopt new technologies;

3. New technologies should be adopted to ensure that health teams have more time to care for and directly interact with patients. Technology should be a facilitator, never a barrier, in patient care.

The digital transformation in health seems to be a ready-made apparatus to allow the data generated by different technological innovations – as exemplified by the arrival of artificial intelligence in medicine – to offer possibilities to improve the safety of clinical trials, the surveillance of new and old diseases, the engagement of patients in the treatment prescribed and, consequently, lead to improvements in results, allowing a better quality of life for patients, from newborns to the growing generation of the elderly (a group that expects to live longer and with quality). The benefits are potentially huge, with obvious social and economic impacts.

Therefore, we must consider: are we preparing for this digital revolution in health? Will we be the agents of this transformation, or those who passively suffer it?

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Perceptions of care among elderly couples

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Abstract

Objective: To analyze the perceptions of care among elderly couples. *Method:* A qualitative exploratory-descriptive type study was carried out in Maringá in the state of Paraná, from May to June 2017. Data were collected through a semi-structured interview conducted at the home of 15 elderly couples and analyzed through Bardin's Content Analysis, discussed in the light of Jean Watson's Theory of Transpersonal Care. *Results:* Three thematic categories emerged: 1) meaning attributed to mutual care; 2) daily activities as forms of care and 3) feelings that permeate care among elderly couples. *Conclusion*: Elderly couples have multifaceted perceptions of care, permeated by their emotional relationship, bonding, partnership and everyday activities. Health professionals should consider the elderly couple rather than isolated individuals, in order to understand the multiple dimensions of care among elderly couples and their influences on health and well-being, facilitating integral and better quality care for this specific population.

Keywords: Health of the Elderly; Primary Health Care; Nursing; Nursing Care.

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INTRODUCTION

Population aging demands a health care system organized with the elderly in mind[1,2]. In recent decades, health professionals, especially those in nursing, have become aware of the importance of elderly care. For this reason, a growth in gerontic-geriatric nursing has been observed, which has allowed the training of professionals to create a type of health care focused on the expectations and needs of those aged over 60[2] and based on an expanded perspective of care.

Health care for the elderly should consider the particularities of this population, as well as their physical, psychic and social aspects and issues related to the promotion of health, so that the care provided is adequate, resolutive and integral[3]. To this end, caring for the elderly should not only guarantee longevity but also quality of life, satisfaction and happiness[3] - which includes understanding the importance of the fullness of conjugal life, encouraging the protagonism, autonomy and independence of elderly couples.

The relationships of elderly couples can frequently last for years, beginning in youth and surviving all the transformations of life until old age[4]. With children leaving home, physiological and emotional changes and in some cases the onset of illnesses, elderly couples begin to care for each other.

In this sense, understanding the perception of care among elderly couples is an important element of combining the care between the couple and the health practices aimed at this population, in order to provide quality health care[5], respecting transpersonality, autonomy and conjugality. Based on the foregoing, the thematic delineation of present study was the expression of care among elderly couples, outlined in the following research question: How do elderly couples perceive and experience mutual care? The study therefore sought to analyze the perceptions of care among elderly couples.

METHOD

A study with a qualitative exploratory-descriptive approach was carried out in a municipal region located in the north-central region of the state of Paraná, Brazil.

The target audience of the study was composed of elderly people living in an area covered by a Basic Health Unit (BHU) located in the municipal region and attended by the university extension project entitled "Home Nursing Care for Families of Elderly Care Dependents" (ADEFI) linked to the Nursing Department of the Universidade Estadual de Maringá.

The inclusion criteria for participation in the study were: being elderly, having a marital relationship with another elderly person, regardless of civil status, and living in the same household or maintaining daily coexistence with a partner/spouse. The exclusion criteria were that one of the partners/spouses lacked effective verbal or cognitive communication skills, according to information from the health team. A total of 15 elderly couples met the criteria and participated in the study.

Data collection took place during the months of May and June 2017, through a semi-structured interview, carried out at the home of the elderly. Two researchers participated in the interviews. The elderly couples chose to be interviewed together, without interfering in the discourse of their partners. A script prepared by three researchers was used as a tool. This was divided into two parts. The first was aimed at collecting data on the sociodemographic characterization of the study participants, and the other comprised the following open questions: What does to care for and be cared for mean to you? Do you think you take care of your partner? What kind of activities/actions reflect this care? Do you think that you are cared for by your partner? What kind of activities/actions reflect this care? What do you think of your married life? Do you believe that caring for and being cared for influences married life? Do you believe that your spouse influences your health? Why?

For the organization, treatment and analysis of the data, the interviews were audio recorded (with an average duration of 20 minutes) using a cell phone, then transcribed in full by the researchers, respecting the reliability of the discourse, and analyzed through thematic type Content Analysis, according to the assumptions of Bardin[6].

This analysis was carried out in five stages: pre-analysis; exploration of the material; processing of data, with systematic organization into thematic units; and construction of inferences and interpretation of significant categories. The thematic analysis, as proposed by this technique, consisted of discovering the nuclei of meaning contained in the communications and the presence or frequency of appearance of which could indicate meanings for the chosen analytic object - mutual care - based on the theoretical referential[6] of Transpersonal Care Theory.

The categories that emerged from this analytical process were discussed in the light of Jean Watson's Theory of Transpersonal Care. This theoretical-philosophical referential portrays care as the basis of Nursing practice and science, focusing on human relations and spirituality as essential to care and healing, as well as the intersubjectivity that make up caregiving[7]. Considering care as an inter-relational and social construction, which must be permeated by a bond and sensitivity, this framework was used to support the present study, as care for elderly couples is a phenomenon that can impact their health and care practices.

All the ethical and legal precepts of National Health Council Resolution Nº 466/2012 were met[8]. The participants signed two copies of a Free and Informed Consent Form, one of which they kept. To ensure anonymity, the reports were identified with the letter "P", referring to the term "Participant", followed by Arabic numerals that corresponded to the order of transcription of the interviews. The study followed all the guidelines of the Consolidated Criteria for Reporting Qualitative Research (COREQ) for qualitative studies.

The research is part of a more comprehensive study and was submitted for the ethical appreciation of the Standing Committee on Ethics in Research with Human Beings (COPEP) of the Universidade Estadual de Maringá, and was approved under Nº 1.954.350/2017.

RESULTS AND DISCUSSION

Fifteen elderly couples were interviewed, giving a total of 30 participants, of whom 15 were men and 15 were women. Ages ranged from 60 to 82 years (mean of 66.4 years). The majority of the elderly (n=18) had an incomplete elementary education, while three had completed elementary school, two had an incomplete high school education, one had completed high school, one had an incomplete higher education and five were illiterate.

In terms of occupation, 27 elderly people said they did not work and 19 were retired. The average time spent living with a current partner was 46.8 years, with the shortest period two years and the longest 61 years. Number of children ranged from zero to 11 (mean of 8.9 children), while number of grandchildren ranged from zero to 23 (mean of 16.7). Only four couples had great-grandchildren, with numbers ranging from one to six and an average of 2.6.

Care is part of the human condition and is a way of expressing humanity. Its definition is complex, as it is a multifaceted and constantly evolving concept[7]. In this way, it can be expressed in different ways. In this study, it was organized through three thematic categories that emerged from the data analysis: 1) the meaning attributed to mutual care; 2) activities of daily living as forms of care and 3) feelings that permeate care among elderly couples.

1) The meaning attributed to mutual care

For the elderly participants in the study, care contributes to well-being and enables the promotion of health. In this way, the elderly feel cared for when they face an illness and also when their partner helps with their recovery, as the following statements show:

> "Caring is to care for her when she is sick, to heal, to medicate, to feel the pain she is feeling. Wanting her to live [...] This is the feeling I have for her, and for me care is contained there". (P2)

> "I think this care [between the couple] is good for the health, because I feel good when I am cared for". (P15)

> "I think that his care has a positive influence on my health and my life, because we have to go through a lot of things in life, and if we just fight all the time, it doesn't work". (P6)

> "Have you ever thought you were alone and sick, with no one to share your pain? Caring for one another helps a lot". (P9)

> "Sometimes we forget to take care of ourselves and end up failing. It is a way of prolonging life, God willing, taking care of each other, we last longer. Care is a privilege for those who have it". (P30)

Care among elderly couples in times of frailty is shown as a way of demonstrating affection, concern and also reciprocating the care and attention one has received from a partner who is now ill. Yet, care can also convey trust and empathy, increasing affective bonds, promoting much more than simple tasks of helping the patient, building a bond wrapped in feelings such as empathy, protection, attention, readiness and understanding[4,5].

It therefore creates a perception of love, care and patience for the caregiver, and a way of demonstrating protection, care and affection for those receiving care[4,5]. These displays of affection involving care between couples can strengthen the relationship, improve the sense of well-being and quality of life of both, and consequently promote health[10].

During times of illness, transpersonal care among elderly couples manifested itself in being together, in reciprocity and in loving, establishing conditions necessary for rehabilitation and healing[7]. The home as an environment of support and protection, expressed by the posture of one's spouse, can help an individual cope with the common disorders of aging and pathologies, preserving physical and cognitive status[7].

In this context, care between a couple in times of disability also reinforces the overall functionality of the elderly person, which is the ability to manage and care for one's own life. This is closely related to well-being, as it generates independence (the ability to accomplish something through one's own means) and autonomy (decision-making capacity)[11].

Although not frequently mentioned, the faith and spiritual support revealed in the discourse of one of the elderly individuals can provide benefits for care during situations of uncertainty and illness, bringing comfort and allowing elderly couples to experience unconditional support. Thus, manifestations of care permeate the beliefs of individuals and are essential elements of transpersonal care, and should be explored by health professionals as a therapeutic strategy[7].

In addition to the bond and affection shown by the elderly towards a spouse when they are frail, there is also a sense of reciprocity, in which an elderly person cares for their partner as a form of repaying care they once received or will yet receive, as the following reports show:

> "It's like that here, when she needs something, I do it. When I need it too, she does it for me. If we're together it's to take care of each other". (P4)

> "Yes, we care because we're together, don't we? I had eye surgery and he took care of me and the house". (P23)

> "I think that when you care for someone he reciprocates by caring for you. You care and you're cared for". (P9)

Everyone needs to be cared for at some point in their life, while at other times they provide care, especially when involved in a relationship and during the aging process. The development of the elderly persons, constructed through family values and personal experiences, emphasizes care as a form of repayment and duty towards the other. This concept is constructed through beliefs, principles and values acquired during life, and can also involve other structural aspects such as affection, love and attention[7,10] that permeate the life of a couple, according to the elderly persons.

In this sense, the concept of the reciprocity of care was clear, as the elderly described performing mutual care, which allows spouses to support the biopsychosocial and spiritual needs of their partners, valuing the interpersonal relationship, which involves transpersonal care[7].

2) Activities of daily living as forms of care

The performance of household activities such as cleaning the house, preparing food, taking care of clothes and other things that keep the home clean,

pleasant and comfortable was also an expression of care, as identified in the following statements:

> "He takes care of me [...] he sweeps the yard even though I tell him that the leaves fall all the time, so there is no need to keep sweeping all the time [...] I think these things are a way of taking care of me ". (P6)

> "She takes care of me because she makes lunch, makes dinner, makes food, washes clothes, cleans the house ... so she's taking care of me". (P11)

> "I take good care of things, I always leave the clothes neat, food ready, the house is always clean". (P17)

> "If I'm doing something and he's got nothing to do, he helps me do it." (P19)

Caring is expressed in different ways and aimed at meeting the needs of the other. In the present study care in the home represented help and partnership, as well as caring and concern, seeking to provide one's partner with an environment that goes beyond their basic needs, and is comfortable and welcoming[7]. In this way, domestic tasks allowed an understanding of the care between elderly couples in a genuine manner, performed for the other, in a transpersonal manner, with love, empathy, concern and attention[7].

Domestic chores are demonstrations of care as they involve dedication, time and energy, especially when exercised by elderly men, who break gender stereotypes for the sake of their partner[12]. The fact that elderly men courageously break this tradition - of the domestic responsibility of the woman - and see these tasks as a marital duty, shows reciprocity towards their wives and gratitude for the care they receive on a daily basis.

The day-to-day relationship and domestic demands emerged as a demonstration of care for the elderly in the present study. Care is not provided alone, as individuals need another to care for and be cared for, and this action pervades the relationship as a whole, not only with one's spouse, but also with the other members of one's family, home and social elements[7]. Therefore, it is very important that these attitudes are stimulated and encouraged, through examples of caring for the male population, and of elderly men caring for their wives, transforming social and cultural values[12,13].

It was observed in the present study that men were involved in domestic activities in two ways: as support for their wives at times of need, with chores remaining her responsibility; and in an egalitarian manner, in which both have the same levels of responsibility. The latter, however, occurs more often in younger than elderly couples[13].

The domestic tasks performed by the elderly help to maintain their overall functionality, as they are fundamental for the self-preservation and survival of the individual. These tasks are part of what are called Instrumental Activities of Daily Living (IADL), which indicate the ability of the elderly person to live alone in the community, and include activities of in-home and domestic care[14,15].

These stimulate cognition (the ability to understand and solve daily problems), mood (motivation to perform activities) and mobility (the ability to move and manipulate), which are the main functional systems in the evaluation of the functionality of the elderly, and are able to provide more autonomy at the same time[14].

3) Feelings that permeate care among elderly couples

Feelings that permeate care among the elderly couples were noted, and ranged from demonstrations of warmth and affection to mutual concerns and advice, highlighted in the following extracts:

> "She always took care of me right, she has a lot of affection for me as I have for her. My wife to me is like a drop of water, delicate, she is a crystal and I have to take care of her". (P11)

> "We've been married for many years. I think the affection and care I have for him is a good example for our children. I feel good doing it, I like taking care of him, I forget about myself to take care of him with pleasure". (P12)

> "The husband has to care for his wife as though she is his child. I have to take care of her and keep her from falling into a hole or tripping, taking care so that she does not cut herself". (P2)

> "[...] If you suddenly need advice, or a warning: don't do this, or don't do that, or even exchange ideas, and so on. It's a type of care she has for me". (P26)

In the present study, long-term married life was closely related to the feelings that permeate the transpersonal care between the couples, such as: companionship, affection, demonstrations of security, reciprocity, friendship, love and mutual giving. In this sense, the transpersonal care that permeates the elderly couple is also related to the emotional capacity[7] of the spouses.

In relation to health, it is emphasized that feelings alter thoughts, behaviors and life habits, and it is necessary to understand the same in the process of care[10]. Positive feelings between couples were created through the interactions between partners and the establishing of a relationship of support and trust, constructed in the communication between the couples and in harmony, empathy, affection, honesty and the positive acceptance of the other, consistent with the interactionist assumptions of Watson[7].

Negative feelings about care among elderly couples were not captured in the present study and this may be related to transpersonal care, which according to Watson[7] goes beyond the ego itself, contributing to care for the other. In this sense, showing sensitivity to a spouse's feelings, as evidenced in the discourse above, integrated the elderly persons with care as a human and transpersonal process[7].

In turn, positive and harmonious relationships between elderly couples helped to maintain the autonomy of the elderly individual, and were related to the main functional systems of mood and communication, in other words the capacity to maintain positive relationships with one's environment, expressing feelings, wishes and ideas[16].

Over the years life undergoes several changes, including children leaving home, which alters the family structure. In this context, elderly couples once again live as they did at the start of married life, only for each other. In these moments, care becomes essential in daily life, so that the relationship is strengthened, as shown in the following extracts:

> "We become more of a partner for each other, we take care of each other, sometimes we go out together, to the shop. We do everything together, after my girls got married it was just the two of us, we have to help each other". (P17)

> "I'm content, we spend the whole day together and I feel really happy with her." (P11)

> "After the children left home we became more attached to each other, because we each take care of the other". (P17)

The elderly couples described the experience of being cared for by their spouses as important and of great benefit to their well-being[7]. The family is of great importance to biopsychosocial well-being as it is an institution of support capable of modulating the functioning of the elderly, and can contribute to both their growth and their decline. Its absence can result in a greater risk of the loss of autonomy and independence, thus making family disability one of the great geriatric syndromes[17].

Returning to the conjugal dyad, as explained in the discourse of the elderly, passes through a reorganization of the roles of both spouses, as they no longer have to provide their attention and concern to their children, but to each other, marked by a return to intimacy and long coexistence, as at the start of married life. In this phase, it is possible for couples to construct a greater, more affectionate bond, provided that within the relationship there is mutual help and companionship[4].

Conversely, there are also cases where both individuals become distant due to difficulties in adapting to the new, two person lifestyle. This is related to the trajectory of their lives to date and the type of relationship they have constructed over the years. However, in most cases the response to these phases is positive and couples are strengthened by the union, affection and pleasure in cohabitation permeated by care[4], as was observed in the present study.

The acceptance of positive and negative experiences and feelings during the events of life alter the thoughts and behavior of the elderly and can interfere with their physical and psychological health. In this way, their feelings and life histories

need to be considered in the relationship of care, either between the couples or with health teams[7].

Given the above, care should go beyond the management of the diseased organ or biological or physiological disorders, and should include the holistic dimension of care, involving spirituality, beliefs, values, psychological changes and social needs[7], which are pertinent to overall functioning[14]. To achieve this and when seeking integral care, health professionals must offer receptive, qualified listening and care for couples, and not just individuals, offering support even in conjugal relationships.

Transpersonal care focuses on the individual as multi-faceted beings. From this perspective, care actions should integrate all the dimensions involved in human beings[7] avoiding the common reductionism of care to biological aspects that involve the disabilities, frailties and physical difficulties affected by aging. The elderly couples in the present study recognized human complexity, and expressed it through extended day-to-day care.

The limitations of the present study are related to the data collection process, as the interviews were performed with spouses present, which may have limited the discourse of the participants, although they themselves chose this arrangement.

It is suggested that further studies are carried out with different methodological approaches, as the perception of care among elderly couples and its meaning needs to be explored more fully by scientific evidence. It is also important to investigate whether family composition and other sociodemographic characteristics influence the perceptions of care of the elderly couples.

CONCLUSION

Care among the elderly couples was considered to be a complex, multifaceted and transpersonal phenomenon, experienced, perceived and demonstrated by support with diseases and disabilities, as well as through housework. It was also manifested in the form of affection, friendship, warmth and companionship, with care being capable of promoting health and well-being in the life of the couple. All of these configurations of care indicate timely strategies for maintaining the overall functionality of the elderly, especially autonomy and independence.

It is important that health professionals consider elderly couples, rather than just individuals, when planning health actions and providing care to the elderly population. They should understand the multiple dimensions of care among elderly couples and their influence on health and well-being, so facilitating comprehensive, individualized and better quality care.

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Patterns of use of time by family caregivers of elderly persons with dementia

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Abstract

Objectives: to describe patterns of use of time in family caregivers of elderly people with dementia, considering the characteristics of the caregivers, the care recipients and the context. *Method:* Fifty family caregivers of elderly people with intermediate and high levels of physical and cognitive disability participated in an interview about time spent on obligatory care activities over four periods of six hours during a 24-hour period. In addition, a questionnaire about social activities, scales of physical and cognitive functionality of the elderly and an inventory of burden in the family caregivers were applied. *Results:* 88.0% of the caregivers were women, with a mean age of 57.9 (±11.2) years; 45.92% of the time of the caregivers was used in care activities, 36.92% in discretionary activities, 31.17% in recuperation, and 25.67% in the obligatory activities of the life of the caregiver. The greater the dependence, the longer the care, the less time for self-care and greater the caregivers' subjective burden. *Conclusion*: The level of dependence of elderly persons affected by dementia results in an increase in caregiving time and competes with other activities performed by the caregiver. Reorganization of the use of time by family caregivers and provision of formal support can reduce the caregiving burden and benefit the well-being of caregivers.

Keywords: Time; Caregivers; Dependency; Activities of Daily Living; Long-term Care. Alzheimer Disease.

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INTRODUCTION

The first studies on the use of time by family caregivers were conducted by Moss et al.[1] and were based on the time budgets methodology, which involves the daily estimating of time spent on activities. While used in industrial and commercial organizations, the methodology was unknown in the context of the formal (provided by professionals) and informal (provided by relatives or other volunteers) care of the elderly. The authors created a situation where, through a "Yesterday Interview", information was obtained on when, where, with whom, for how long, and what activities were performed by caregivers in a 24-hour period prior to the interview. The data were recorded in a matrix that covered the 24 hours of the day, subdivided into 96 periods of 15 minutes, and then tabulated within the following classes created in a parallel study conducted by Moss and Lawton[2]: activities of instrumental assistance such as cleaning the house and preparing food, as well as personal care such as bathing and toilet use, provided to the elderly care recipient; activities that were obligatory (self-care, work and care for the home and family) and discretionary activities in the caregivers´life (active and passive leisure and rest).

Further research has shown that family caregivers devote more time to protection and instrumental assistance than formal caregivers[3,4]. Most family caregivers are spouses or daughters of the care recipients, do not perform paid work outside home, have low levels of schooling, reside with the care recipient, and are the sole or main caregivers[5-7], possibly assisted by relatives and friends. The presence of these secondary caregivers tends to cause distortions in estimates of the use of time of primary caregivers[3,8]. In Brazil, the role of domestic workers in the care of dependent elderly persons tends to be seen as part of domestic chores, which is another source of distortion[9].

The time devoted to basic activities of daily living (BADL) and instrumental activities of daily living (IADL) and the time spent on supervision increases proportionally with the worsening of dementia[10,11]. Thus, as the number of people affected by dementia in the population increases, there is a greater need for informal care and the creation of informal support networks[12].

Time spent on obligatory care activities restricts the participation of informal caregivers in discretionary activities, including social activities outside home, such as religious activities and work, and at-home activities such as reading and communication with friends and relatives through social networks. Two of the most recurrent complaints of family caregivers are the deprivation and the sense of loss of control over one's own social life [13]. Obligatory care activities are the most time consuming,[14,15] generating dissatisfaction with the constraints they place on personal, domestic and social activities[16], and are most associated with depressive symptoms and with a sense of lack of social support[17]. Caregivers perceive restrictions on their leisure activities as stressful and onerous, but their participation in social group activities can mitigate the negative effects of caregiving[18].

The objective burden of family caregivers of elderly people with dementia is associated with the progression of the disease and with increased physical and cognitive dependence , the neuropsychiatric problems of the care recipient and the great number of hours needed for direct care and supervision[11,19,20]. The subjective burden is associated with depression and emotional distress, with a sense of unmet needs and restrictions on the daily time available for self-care, social participation, family commitments, and paid work[4,15,21]. Clinical, psychosocial, and educational interventions aimed at managing the time spent on care can mitigate the impact of caring for elderly persons with dementia on the well-being of caregivers.

Currently, there are no data on the schedules of time dedicated to obligatory activities of care, personal and family life and discretionary activities by Brazilian family caregivers of elderly people with dementia. Bauab and Emmel[22] focused occupational and motivational aspects of the use of time by formal caregivers, and not those concerning the provision of care within the family.

The management of time by family caregivers of elderly people with physical and cognitive dependencies is an important element in determining the quality of care and the well-being of both the elderly care recipients and the family caregivers. The use of a valid methodology can benefit the reliability

of the data regarding the phenomenon. The purpose of the present study was to describe patterns of the use of time by caregivers of elderly people with dementia and to investigate relationships between these patterns and characteristics of the caregivers, the care recipients, and the context of care.

METHOD

A descriptive study was carried out with a convenience sample composed of 50 family caregivers of elderly people with dementia assisted at the Integrated Medical Care Center of the University of Fortaleza (NAMI/UNIFOR, Brazil) and at the Brazilian Alzheimer's Association - Ceará Region (ABRAz-CE) support service, who agreed to participate in the study, whose data collection occurred form May to July 2017. The inclusion criteria for caregivers were: age 50 or older; be a spouse, son or daughter or other relative of an elderly person diagnosed with dementia by a physician, in accordance with the terms of the medical records; reside with the elderly recipient of care and be the primary caregiver. The exclusion criteria were: cognitive, sensory, comprehension and communication impairments that made the participation of the caregivers in the interview unfeasible, according to the judgment of three trained recruiters (two students of a specialization course in Gerontology and the researcher). The caregivers were recruited in person or by telephone, always with the consent of the directors of the services.

Use of time: to measure the dependent variable a semi-structured interview was organized, according to the "Yesterday Interview" proposed by Moss et al, 1993[1]. The interviewer followed a script in which the daily activities of the caregiver, grouped in obligatory and discretionary of the caregivers´life, oblicatory of care, and recovery, were presented in a printed time matrix with four 6-hour periods (morning, afternoon , night and dawn), with appointment of each hour.A script was drawn up in which the activities of the caregiver, grouped into the classes obligatory for care, obligatory in the life of the caregivers, discretionary and recuperation, were presented in a printed matrix of time, with four periods of six hours each (morning, afternoon, night and early hours). The care provided to the elderly included: physical care (bathing, giving food, giving medicine, taking to the bathroom, dressing and tidying up); social and emotional support (reading, talking, praying together, keeping company, and helping to organize the belongings of care recipients). Activities relevant to the life of the caregivers included: self-care (eating, hygiene, beauty and physical exercises inside and outside the home) and family life (domestic activities, taking care of grandchildren, shopping for daily needs, cooking, washing, ironing, sweeping, and caring for animals and plants). Discretionary activities included: personal life (leisure, art, crafts and religious, TV, reading, solitary games, praying and meditating) and social life (phoning, chatting, writing e-mails and receiving visits, making visits, attending meetings, restaurants, cinema, church, , courses, classes and shopping centers). The recuperation activities included rest and sleep.

Contextualization of care in the family environment: Through self-reported items the following characteristics were assessed: the age and gender of the elderly care recipients; the degree of kinship between the caregivers and the elderly persons with dependencies (spouse, father or mother, father-in-law or mother-in-law, grandparent or other relative); availability of practical help, domestic workers, daytime, night and weekend companions, and home support services. All items were dichotomous in nature.

Conditions of dependency of the elderly care recipients: the main medical diagnosis of the elderly care recipients (through an open item), their level of physical dependence, measured by the Pfeffer Questionnaire of Functional Activities[23-25] and their level of cognitive dependence, assessed by the Clinical Dementia Rating (CDR)[26-27]. These two scales are commonly applied to surrogate informants when the level od dependence of the elderly impairs their ability to respond. The Pfeffer Scale consists of ten items that evaluate independence-based functionality to perform instrumental activities of daily living (controlling one's finances; shopping; heating water and turning off the oven; preparing meals; keeping up to date; watching and discussing the news; remaining orientated when moving around the neighborhood; remembering appointments; taking care of own medication and staying home alone[24]. Each item is scored from

zero (independence) to three (dependency), with higher values indicating greater dependence. The reliability and reproducibility of the instrument was demonstrated by a psychometric study involving Brazilian elderly persons[25]. The CDR comprises six cognitive-behavioral categories: memory, orientation, judgment or problem solving, community relations, home or leisure activities personal care. Each category was scored from zero to three points (0 = no change, 0.5 = questionable dementia, 1 = mild dementia, 2 = moderate dementia and 3 = severe dementia), except for the personal care category, which did not include the score 0.5. The memory category received the most weight in the evaluation [26,27]. The final classification of the CDR is obtained by the analysis of the classifications by categories, following a set of rules elaborated and validated by Morris[26]. The instrument does not include cut-off scores based on population performance, since the results of the elderly are compared to the scores they obtained in the past.

Perceived burden as a result of the provision of care: this was assessed using the Zarit Burden Scale[28,29], which consists of 22 items with five points each (from 0 = never to 4 = always), assessing the level of perceived burden of the caregiver with regard to health, personal and social life, financial situation, emotional well-being and interpersonal relationships. The instrument generates a total score ranging from 0 to 88. In Brazil, Scazufca[29] performed the translation and semantic-cultural validation of the instrument using data from samples of caregivers of elderly people with mood and other psychiatric disorders. The Cronbach's alpha index, an indicator of internal consistency, was 0.87. The distribution was divided by terciles (≤ 32, 33 to 56 and ≥ 57 points), indicating low, moderate and high burden.

Social activities performed outside home by caregivers: these were evaluated by eight dichotomous items specifically designed for the study: (a) go to hairdresser, manicurist, physiotherapy or the gym, or make purchases for oneself; (b) go to church or temple for religious services or participate in religious activities or groups; (c) attend social events, parties and meetings; (d) go to cultural events, such as concerts, shows, and exhibitions, the movies and the theater; (e) participate in meetings of boards or councils or carry out political activities; (f) attending courses or participating in social (g) take short trips (day or weekend); (h) visiting.

Sociodemographic characteristics of caregivers: gender (male or female); age indicated by date of birth; marital status (married, widower, single, divorced); performed paid work (yes or no) and years of schooling (in response to the question "up to what school year did you study?").

Formal acceptance of participation was carried out by signing a free and informed consent form, drafted in accordance with the requirements of Resolution No. 466 dated December 12, 2012, of the National Health Council (NHC), and approved by the Research Ethics Committee of the State University of Campinas, Brazil, on 06/04/2017, under approval nº 2.003.545.

Data were collected in individual face-to-face interviews, chaired by one of three trained interviewers, performed at ABRAz-CE (36.0%), NAMI/UNIFOR (62.0%) and at the households of a group of caregivers who declared that they could not leave home or the elderly care recipient (2.0%). All the participants were interviewed in a single session with a mean duration of 62 (± 9.2) minutes. About 30% of this period was devoted to evaluations that were of interest to other surveys and were not included in this research.

The results of the Shapiro-Wilk normality test applied to the sample suggested the use of non-parametric tests. Pearson's Chi-squared test and Fisher's Exact test were used to compare the frequencies of the categorical variables according to the variabels of interest. To compare the distributions of the ordinal variables, the Mann-Whitney U test for two independent samples and the Kruskal-Wallis test for three or more independent samples were used. To compare the time spent by the caregivers on the four types of activities, the Friedman and Wilcoxon tests for related samples were used. Spearman correlation analyzes were performed between the distributions of daily estimates of time in each class of activity, the results of the caregivers on the burden scale, and the scores attributed to the elderly in the Pfeffer and CDR scales. The internal consistency of the scales was measured and had Cronbach's alpha as an indicator.

RESULTS

Most of the caregivers were women, adults, and married. The mean age was 57.9 (± 11.2) years; 78.0% had nine or more years of schooling; 77.6% did not perform paid work (Table 1).

The mean age of the care recipients was 79.6 (± 7.5) years. Most were sons or daughters, but 32.6% were spouses of caregivers. On average, the caregivers had provided care for 40.3 (± 23.6) months. Most of the caregivers had unpaid practical help (mainly from other relatives) while only 18.0% had paid help, mostly from domestic workers (77.0%) or from a daytime (12.1%) or weekend companion (10.9%). Only 4.0% had private formal home support. On average, caregivers have been performing; 2.9 social activities outside the home. Eighty-four percent of caregivers reported that the main health problem of the elderly was Alzheimer's Disease; 16.0% reported cerebrovascular diseases. At the same time, some of the care recipients had cardiovascular disease (12.0%), diabetes mellitus (10.0%), Parkinson's disease (4.0%), arthrosis or rheumatism (2.0%) or immobility (2.0%). Most care recipients had intermediate level scores on the Pfeffer Scale, while 32.0% scored in the upper third and 22.0% in the lower third. The distribution of CDR scores followed a similar trend: 22.0% were rated as having questionable or mild dementia and 78.0%, moderate to severe dementia. Most caregivers had moderate (33-56) or high (≥57) scores on the burden scale. The functional independence[23-25], stage of dementia[26,27] and perceived burden[28,29] subscales exhibited high internal reliability, indicated by Cronbach´s alphas of 0.935, 0.947 and 0.872, respectively (Table 2).

The caregivers reported that on average they spent 11.02 hours of the day providing direct care to the elderly, 8.86 hours in discretionary activities and 6.16 hours in obligatory activities related to their own life, such as care of the home. An average of 7.48 hours were dedicated to rest or recuperation activities. In other words, caregivers spent 45.92% of their daily time on care activities for the elderly; 36.92% on discretionary and, 25.67% on obligatory activities from their own lives, and 31.17% on recuperation activities. The data showed simultaneity in the performance of the caregivers activities. The caregivers spent more time on direct care for the elderly and on obligatory activities of their own lives in the morning and afternoon. Discretionary activities were conducted mainly at night. In the early hours, caregivers spent most of their time resting and caring. . In terms of both total hours of care during the day and the time each day proportionally reserved for the various types of activities, the highest values were for care of the elderly and discretionary activities. Table 3 shows the results of the comparisons between the amount of time dedicated to the different classes of activities each day. A statistical penalization procedure (Bonferroni correction) was adopted for the Wilcoxon test, in order to reduce the possibility of the occurrence of significant differences by chance.

The duration of the activities were compared considering the characteristics of the caregivers, the conditions of the context of care and the characteristics of the elderly care recipients. Women, caregivers who did not work, and those without paid support provided care for more hours in the morning than male caregivers and caregivers who worked. Caregivers of the elderly who were neither spouses nor sons or daughters spent more time on discretionary activities than those who cared for a parent or spouse. Caregivers of parents reported spending more time than caregivers of spouses and other relatives on obligatory activities from their own lives. Caregivers of parents spent more time providing care than caregivers of spouses or other relatives. In the afternoon, those who cared for their parents and those who were responsible for elderly persons with greater physical and cognitive disabilities spent significantly longer periods providing care than those who cared for a spouse or other relative and those who cared for more independent elderly persons. Caregivers with lower perceived burden spent more time resting than their peers who report greater burden (Table 4).

Although the correlation indicators were not high, it was observed that the higher the caregiver burden score and the higher the scores of the elderly care recipients on the Pfeffer and CDR scales, the more time the caregivers spent on care activities for the elderly. No other statistically significant correlations were observed (Table 5).

Table 1. Sociodemographic characteristics of caregivers. Fortaleza, Ceará, Brazil, 2017.

Variables	Conditions	n (%)	Mean (standard deviation)
Gender	Male	6 (12.0)	----
	Female	44 (88.0)	
Marital status	Married	22 (44.0)	----
	Single	19 (38.0)	
	Divorced	6 (12.0)	
	Widowed	3 (6.0)	
Age	< 40-59	29 (58.0)	57.9 (±11.2)
	60-69	10 (20.0)	
	70 years +	11 (22.0)	
Years of schooling	1 to 4	2 (4.0)	11.6 (±3.7)
	5 to 8	9 (18.0)	
	9 or more	39 (78.0)	
Paid work	Yes	11 (22.4)	----
	No	38 (77.6)	

Table 2. Characterization of the context of care. Fortaleza, Ceará, Brazil, 2017.

Variables	Conditions	n (%)	Mean (sd)
Age of care recipients	60-69	6 (12.0)	79.6 (±7.5)
	70-79	18 (36.0)	
	80 or more	26 (52.0)	
Relationship between caregivers and care recipients	Spouse	16 (32.6)	----
	Parents	28 (57.2)	
	Other relatives	5 (10.2)	
Receive unpaid help	Yes	33 (66.0)	----
	No	17 (34.0)	
Receive professional help	Yes	9 (18.0)	----
	No	41 (82.0)	
Number of activities carried out by caregivers outside the home	0	1 (2.0)	2.9 (±1.7)
	1 to 3	34 (68.0)	
	4 to 8	15 (30.0)	
Pfeffer Scale scores of care recipients	< 22	11 (22.0)	25.3 (±6.9)
	23 to 29	23 (46.0)	
	> 30	16 (32.0)	
Clinical Dementia Rating (CDR) scores of care recipients	< 9	11 (22.0)	2.0 (±0.8)
	10 to 15	25 (50.0)	
	> 16	14 (28.0)	
Perceived burden scores of caregivers	≤ 32	14 (28.0)	43.5 (±15.0)
	33-56	26 (52.0)	
	≥ 57	10 (20,0)	

Table 3. Daily schedule of time dedicated to the performance of obligatory, discretionary and recuperation activities by family caregivers of elderly people with physical and cognitive dependencies. Fortaleza, Ceará, Brazil, 2017.

Activities	Means* (sd)	Medians	Min-Max	p**
Over 24 hours				
Obligatory care for the elderly	11.02 [a] (±3.60)	10.00	5.00-18.00	<0.001
Discretionary	8.86 [b] (±2.22)	9.00	3.00-15.00	
Obligatory in caregiver's life	6.16 [c] (±4.93)	6.00	0.00-18.00	
Recuperation	7.48 [c] (±1.58)	7.00	4.00-10.00	
Morning				
Obligatory care for the elderly	4.12 [a] (±1.69)	4.50	1.00-6.00	<0.001
Discretionary	2.54 [b] (±1.16)	2.00	0.00-5.00	
Obligatory in caregiver's life	2.92 [b] (±2.19)	3.00	0.00-6.00	
Recuperation	0.14 [c] (±0.35)	0.00	0.00-1.00	
Evening				
Obligatory care for the elderly	3.66 [a] (±1.73)	4.00	0.00-6.00	<0.001
Discretionary	2.48 [c] (±1.50)	2.00	0.00-6.00	
Obligatory in caregiver's life	2.14 [c] (±2.21)	1.00	0.00-6.00	
Recuperation	0.76 [b] (±0.69)	1.00	0.00-2.00	
Night				
Obligatory care for the elderly	2.66 [a] (±1.60)	3.00	0.00-6.00	<0.001
Discretionary	3.60 [b] (±1.20)	4.00	1.00-6.00	
Obligatory in caregiver's life	1.10 [c] (±1.63)	0.50	0.00-6.00	
Recuperation	1.32 [c] (±1.08)	1.00	0.00-4.00	
Early Hours				
Obligatory care for the elderly	0.58 [b] (±0.95)	0.00	0.00-4.00	<0.001
Discretionary	0.24 [b] (±0.62)	0.00	0.00-3.00	
Recuperation	5.26 [a] (±1.16)	6.00	0.00-6.00	
% of daily time				
Obligatory care for the elderly	45.92 [a] (±15.00)	41.67	20.83-75.00	<0.001
Discretionary	36.92 [b] (±9.26)	37.50	12.50-62.50	
Obligatory in caregiver's life	25.67 [c] (±20.54)	25.00	0.00-75.00	
Recuperation	31.17 [c] (±6.59)	29.17	29.17-41.67	

* Values of means indicated by different letters are significantly different and values indicated by the same letter are not; ** Friedman test, followed by the Wilcoxon test in pairs, with Bonferroni correction.

Table 4. Daily schedules of time use according to characteristics of the caregivers. conditions of the context of care and characteristics of the elderly care recipients. Fortaleza. Ceará, Brazil, 2017.

Variables/conditions	Activities x periods of the day	n	Mean (sd)	Median	p
Gender of caregiver					
Male	Care of elderly person – Morning	6	2.17[b] (±2.32)	2.00	0.045*
Female		44	3.86[a] (±1.56)	4.00	
Paid work by the caregiver					
Yes	Care of elderly person - Morning	11	3.00[b] (±1.73)	3.00	0.020*
No		38	4.39[a] (±1.55)	5.00	
Help from domestic worker or paid caregiver					
Yes	Obligatory activities in the life of the	9	1.00[b] (±1.66)	0.00	0.005*
No	caregiver – Morning	41	3.34[a] (±2.08)	4.00	
Relationship of caregiver with elderly care recipient					
Spouse	Discretionary activities in the life of	16	1.94[b] (±1.24)	2.00	0.016**
Father/Mother	the caregiver - Afternoon	28	2.50[b] (±1.40)	2.00	
Other		5	4.40[a] (±1.52)	5.00	
Spouse	Obligatory activities in the life of the	16	1.81[b] (±2.17)	1.00	0.011**
Father/Mother	caregiver – Morning	28	3.64[a] (±1.91)	4.00	
Other		5	1.80[b] (±2.00)	1.00	
Spouse	Obligatory activities in the life of the	16	1.00[b] (±1.63)	0.00	0.029**
Father/Mother	caregiver – Afternoon	28	2.64[a] (±2.18)	2.00	
Other		5	2.20[a.b] (±2.68)	1.00	
Spouse	Obligatory activities in the life of the	16	3.50[b] (±3.92)	2.00	0.013**
Father/Mother	caregiver – All	28	7.36[a] (±4.46)	8.00	
Other		5	5.60[a.b] (±5.68)	2.00	
Pfeffer Scale Score					
≤ 22	Care of elderly person – Afternoon	11	2.36[b] (±1.80)	2.00	0.029**
23-29		23	3.96[a] (±1.49)	4.00	
≥ 30		16	4.13[a] (±1.67)	4.00	
22	Care of elderly person – All	11	8.82[b] (±4.19)	7.00	0.006**
23-29		23	10.83[a.b](±3.24)	10.00	
≥ 30		16	12.81[a] (±2.86)	12.50	
Score of elderly care recipient in Clinical Dementia Rating (CDR)					
0.5-1.00	Care of elderly person – Afternoon	10	2.30[b] (±1.83)	2.00	0.030**
2.00		26	4.00[a] (±1.47)	4.00	
3.00		14	4.00[a] (±1.75)	4.00	
0.5-1.00	Care of elderly person – All	10	8.40[b] (±3.47)	7.00	0.007**
2.00		26	11.23[a] (±3.46)	10.00	
3.00		14	12.50[a] (±3.13)	12.50	
Perceived burden of caregiver					
≤ 32	Care of elderly person – Early hours	11	0.45[a.b] (±0.82)	0.00	0.031**
33-56		22	0.23[b] (±0.53)	0.00	
≥ 57		10	1.30[a] (±1.42)	1.00	
≤ 32	Recuperation – All	11	8.09[a] (±1.87)	8.00	0.020**
33-56		22	7.77[a] (±1.02)	8.00	
≥ 57		10	6.20[b] (±1.55)	7.00	

* *P* values for the Mann-Whitney U test, for comparison between two independent samples; ** *p* values for the Kruskal-Wallis test, for comparison between three independent samples, followed by the Dunn test for multiple comparisons. Mean values indicated by different letters are significantly different.

Table 5. Correlations between the values of use of time, caregiver burden, and physical and cognitive functioning of care recipients. Fortaleza, Ceará, Brazil, 2017.

	Hours spent per day on care for the elderly	Hours spent per day on discretionary activities	Hours spent per day on activities of caregiver	Hours spent per day on recuperation
Perceived burden score of caregiver	*rho* = 0.307 *p* = 0.030*	*rho* = -0.025 *p* = 0.863	*rho* = 0.006 *p* = 0.964	*rho* = -0.223 *p* = 0.120
Pfeffer functionality scale score of recipients of care	*rho* = 0.458 *p* = 0.001*	*rho* = 0.038 *p* = 0.792	*rho* = -0.009 *p* = 0.496	*rho* = -0.086 *p* = 0.554
Clinical Dementia Rating (CDR) score of care recipients	*rho* = 0.433 *p* = 0.002*	*rho* = -0.078 *p* = 0.592	*rho* = -0.007 *p* = 0.963	*rho* = -0.217 *p* = 0.130

* Spearman Test; *p sign* < 0.05.

DISCUSSION

The present study investigated relationships between the use of time of family caregivers of elderly persons with dementia, considering the circumstances under which care was provided. The caregivers were mainly women, who lived and cared for parents and spouses with moderate to severe levels of physical and cognitive dependence. They reported that most of their daily time was spent on obligatory care activities for the elderly and on caring for the family, home, and themselves, especially in the morning. Next came discretionary activities, performed primarily at night and, lastly, recuperation activities, which occurred mainly in the early hours. In the morning and the afternoon, caregivers spent significantly more time caring for the elderly than on discretionary activities and obligatory activities for the home, family, and self-care. In the early hours, significantly more time was spent on recuperation and caring for the elderly than on obligatory activities in the life of the caregiver and self-care activities. The greater the dependence of the care recipients, the more time spent on care and the greater the perceived burden of caregivers.

Due to cultural and historical determinisms that match the sample of this study with those of other studies carried out in Brazil and abroad, the sample population was essentially female, aged 50 years or over, composed of daughters and spouses of the care recipients, with whom they resided and of whom they were the main caregivers[5,6,30]. Even in countries with a greater tradition of formal care for the elderly than Brazil, family caregivers are mainly responsible for the daily care and supervision of elderly people with dementia[13]. Replicating a characteristic of this cohort, which is not necessarily repeated in other countries, the majority did not perform paid work[31]. Mirroring the influence of the locations from where the elderly were recruited, the level of schooling of the sample was higher than that of the general population of the same age, today, in Brazil and in Fortaleza, State of Ceará[32].

It was observed that more time was dedicated to take care of parents than of spouses, probably because the parents in the study are older and, consequently, have more physical and mental health impairments than their spouses. Most care recipients had moderate to severe dementia and an intermediate level of functional dependence. These data replicate those of Hajek et al.[11] and Haro et al.[21], in which the time the informal caregiver devotes to care increases proportionally with the increased severity of dementia. The authors state that the time devoted to care may vary according to the needs of the care recipient, the stage of the disease and the caregiver's circumstances and burden. They also consider that all categories of informal care time related to assisting with BADL, IADL and supervision are related to the severity of dementia, as well as the total time devoted to care.

Discretionary activities, which mainly involve leisure and social activities, are the first to be sacrificed for more full-time dedication to care, generating a sense of loss of freedom and privacy in family caregivers. Schüz et al.[18] observed that caregivers who perceived a restriction in their leisure

activities suffered more from the effects of stress and burden of care on their mental health. They observed a relationship between stress and burden, with repercussions such as depressive and anxiety symptoms, and a lower satisfaction with life. These can be attenuated through participation in group social activities. Informal caregivers of elderly people with dementia can benefit from leisure and social activities, as well as from self-help groups.

Considering that the majority of caregivers were individuals with a relatively high socioeconomic status by the standards of Fortaleza, and especially considering the local culture, the number of caregivers who described having help from a domestic worker when providing care was noticeably low. Although not hired to provide care, which would have yielded a negative response, in practice these individuals perform care tasks as an extension or a natural consequence of their roles. The probable lack of qualifications of these workers, who were generally low-income and low-educated women, coupled with the shortage of formal support services, ratifies the culture of the use of domestic staff in care activities[9] and contributes to a lack of fair treatment and consequently avoidance of the issue of the professionalization of family care of the elderly.

The data from present study replicate others from literature on the subjective and objective burden associated with the time spent caring for relatives with dementia, considering sociodemographic characteristics, the context of care and the number of hours spent providing care. Most caregivers were women who cared for elderly people with physical and cognitive dependence, women and men who spent more hours caring for others than for themselves, and people who lacked time to rest and dedicate to themselves[4,15,19,33]. The time spent caring for an elderly person with dementia unfolds as part of a daily life divided into multiple tasks and roles that absorb the time of the caregiver and tend to generate dissatisfaction and burden. Pereira and Soares[34] observed a high prevalence of depression and poor sleep quality in caregivers of elderly patients diagnosed with Alzheimer's and Parkinson's diseases.

Comparing the daily time spent on activities performed in the four periods of the day, it was found that the caregivers invested their time firstly in activities of care and secondly in discretionary activities partly realized at the same time as their care and nursing duties. Even so, discretionary activities were significantly more frequent than those dedicated to the care of the home, to self-care and to recuperation activities. There exist overlap between the tasks of caring for the elderly, domestic and personal tasks of the caregiver, tasks of supervision, and tasks performed concurrently by other family members and caregivers. The lack of accuracy of the data in this respect can camouflage information about objective and subjective burden and the unmet needs of family caregivers of elderly people with dementia.

According to the surveys by Wimo et al.[14], Novelli et al.[35], Vaingankar et al.[15] and Bauab and Emmel[22], the time spent on obligatory care prevails over the time spent on other activities, to the detriment of self-care and discretionary activities. It is as if caregivers are oppressed by the role of caregiver, becoming hostage to their dedication. In this light, the question to be answered is whether societies will continue to hold the family solely responsible for caring for elderly persons with physical and cognitive dependence. If on the one hand caregivers have the pleasant possibility of caring for their elderly relatives and, in doing so, accomplish an evolutionary task of high moral and ethical value, on the other, they become a silent victim of care.

It was not possible to measure the time spent on simultaneous tasks, nor the time provided by domestic staff and formal services, which probably caused an overestimation of the hours devoted to care. This problem was considered by Neubauer et al.[8], who calculated a distortion of 14% caused by the disregard of the action of other caregivers in the domestic scenario. Although there is no quantitative data relating to this concept, in Brazil, the role of domestic workers in the care of dependent elderly tends to be seen as part of their household chores[9].

The results are not exactly new or surprising. It is understandable that the higher the level of dependency of the care recipient, the greater the time dedicated to their care and the greater the burden on caregivers. The main limitations of the study are: the absence of greater variability in the levels of physical and cognitive dependence of care recipients; the lack of quantification and qualification of assistance from

domestic helpers and other sources of support; the absence of quantification of daily and weekly time spent on paid work and the lack of a record of the type of occupation exercised by caregivers.

The fact that this study is the first in Brazil to offer data that promotes the understanding of how family caregivers of elderly people with dementia use their time and how this use covariates not only with the degree of physical and cognitive dependence of the care recipients, but also the characteristics of caregivers and their families, and the social norms of gender and age in force at a given historical moment. Also worthy of note is the providing of a new and objective perspective for the consideration of criteria of hiring and remuneration of professional caregivers of the elderly, the addressing of which is long overdue considering the reality of aging in Brazil.

CONCLUSION

The present study showed that the greater the physical and cognitive dependence of the elderly care recipients, the more time was devoted to care on a daily basis, the less time the family caregivers dedicated to themselves and their family and the greater the sense of burden associated with providing care. This knowledge may help professionals who work with the elderly population improve the focus of educational interventions and psychosocial support to informal caregivers of the elderly, in addition to placing emphasis on the stress of caregivers and the need to offer them affective assistance. The new perspective derived from the reported data includes the realization of interventions focused on the development of skills to plan and organize the amount of daily time dedicated to the care of the elderly; the introduction of sufficient discretionary activities to meet the interests of caregivers; and the inclusion of leisure and rest activities and activities related to the life of the family and the caregivers. It includes motivating and training caregivers to delegate tasks, to obtain and accept informal and formal help, and to activate formal mechanisms of assistance. These are sensitive aspects of the current scenario of family care for the elderly, which will be increasingly important in the years to come, when the number of elderly people with dementias will increase sharply, due to the increase in population longevity. Caring for the circumstances of caregiving, among which are the time dedicated to the tasks of supporting an elderly person with physical and cognitive dependencies, can improve the physical and psychological well-being of family caregivers, benefiting not only them, but also those who receive their care.

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The practice of care in long-term care facilities for the elderly: a challenge for the training of professionals

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Abstract

Objective: to analyze how care is performed, understand the contributions of previous experience to professional practice in Long-Term Care Facilities for the Elderly (LTCFs), and recognize the challenges and propositions for professional training and the delivery of care in LTCFs. *Method*: an exploratory qualitative study was carried out in two stages with 33 professionals and managers of a long-term care facility in a municipality in the state of São Paulo. Analysis was performed using Collective Subject Discourse and Thematic Content Analysis (first and second stage, respectively). *Results*: It was found that, in the views of health professionals and managers, the quality of care is linked to basic needs and the training of professionals does not consider the specificities of gerontological care. They therefore reproduce a fragmented and mechanical work process. *Conclusion*: The results highlight the need to revisit courses in the area of health in order to understand their approach to training in elderly care.

Keywords: Homes for the Aged; Comprehensive Health Care; Aging Teaching; Health of the Elderly.

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INTRODUCTION

Aging is a heterogeneous, complex and natural process that continues throughout life, bringing about biological, social and psychological changes in individuals[1]. This process increases the demand for long-term care, as prolonged exposure to chronic-degenerative diseases leads to situations of vulnerability, something that permeates the lives of many Brazilian elderly persons[2].

Another factor affecting this demand is the transformations in Brazilian society. Changes to family make-up, a reduction in birth rates and a decline in intergenerational bonds have reduced the availability of family care[3].

While family care provides great benefits for the public and private spheres, and remains prevalent, the demand for long-term formal care is increasing[4]. Long-term care facilities for the elderly (LTCFs) are one option for such care. These facilities must meet the needs of this population, taking into account their life histories, preserving their independence and autonomy, and facilitating their understanding of the process of aging and institutionalization, so encouraging them to become protagonists of their own process of care[5,6].

Most Brazilian LTCFs face problems, however. They do not prioritize the hiring of professionals trained in gerontological care and possess limited resources, making it difficult for the elderly to participate in the management of their own care[7,8].

There is also a predominance of care professionals who reproduce automated techniques and consider only the physiological needs of the elderly, diminishing the importance of individual needs and ignoring the singularities of residents[9].

Considering the context of demographic transition caused by an aging population and the emerging needs of the elderly in Brazil, families are increasingly choosing LTCFs as a care option for such individuals. However, educational institutions and the LTCFs themselves have not kept up with these changes, lacking both a strategic agenda focused on the processes of aging and the production of technologies that can meet the needs of the country[10,11]. From an academic perspective, there remains little focus on elder care in the curriculum[12], while in the health services there have been problems with the implementation of the National Policy on Elderly Health[13]. An understanding of the conditions for the care of the elderly that exist in LTCFs is therefore essential, along with an identification of the challenges faced when training workers to provide care.

The objective of the present study was therefore to analyze how care is carried out, to understand how previous experience contributes to professional practice in LTCFs, to identify the challenges faced and to propose changes to professional training and how care is performed in such facilities.

METHOD

An exploratory qualitative study was carried out between October 2016 and June 2017 in a non-profit LTCF with 54 residents, in a medium-sized city in the rural part of São Paulo. The Theory of Social Representations was used as a theoretical reference in the research (TSR)[14].

The LTCF studied was intentionally chosen due to its philosophy of caring for the elderly without distinctions of any kind. All the care professionals and managers of the institution were invited to participate in the research. Of the 40 staff of the institution, 33 agreed to participate in data collection, of whom four were managers and 29 other types of care professionals. The inclusion criterion was that the individual must have worked at the LTCF for at least three months. Although all the care professionals were formally employed, the managers worked on a voluntary basis.

The first step involved individual interviews conducted by a trained researcher, namely the author of this article, which had an average duration of 15.7 minutes and consisted of the following question aimed at managers: "What do you consider as a criterion for the quality of care provided in this institution? Why?". The aim of asking about the understanding of the quality of care of the managers was to learn about their perspective on the care provided at the LTCF as volunteer workers without any prior preparation for the role, as well as identifying which issues they

value and whether there is a need to intervene in the training of professionals for the position.

The questions for the care professionals were as follows: "How do you deliver day-to-day care for the elderly? How does your previous experience contribute to your professional practice in the LTCF? What changes are required in your work and the LTCF to improve care for the elderly? Do you think that your training requires changes that could contribute to your professional practice? Give examples.".

This stage was analyzed through the Discourse of the Collective Subject (DCS) technique. The DCS is a technique for tabulating and organizing qualitative data, based on the TSR, which seeks to reconstruct Social Representations (SR), while preserving the articulation of the individual and collective dimensions[15]. The material was processed by three researchers, with evaluation and validation of the systematization of the data.

The analyzed and systematized material was then presented by the same researcher to care professionals and managers in five workshops (second stage), with an average duration of 57 minutes, in order to explore the reflections about the central ideas that emerged more deeply and to identify proposals for the challenges described.

In order to avoid placing constraints on or inhibiting participants during the reflexive processes, the workshop involving managers was carried out separately.

The second phase of this investigation involved thematic Content Analysis[16]. All material collected through the interviews and workshops was audio recorded following the consent of the participants and, after being transcribed in full, was saved for data analysis and then deleted. In order to facilitate the presentation of the collected data, the letter M was used for managers and P for care professionals, followed by an increasing numeric sequence.

The present study was approved by the Ethics Research Committee of a public university in a city in the state of São Paulo under CAAE Nº 57229316.7.0000.5413, complying with resolution 510/2016 relating to research involving human beings. It was also approved by the board of the LTCF being studied.

RESULTS

All the managers interviewed were elderly (60-75 years). The majority were female (n=3; 75%), married, had at least one university degree, had not taken a specialization or other course in the area of gerontological care and had worked at the institution for an average of 13 years (± 5.35). The mean age of the care professionals was 39.7 years (± 12.45), with women predominating among this group (n=24; 82.7%). The majority of the care professionals were married (n=17, 58.3%) and had no previous experience of caring for the elderly (n=15, 51.7%). A total of 16 (55.2%) had graduated from a technical or higher education course, while one (3.4%) was currently studying on such a course. One had graduated in the area of social care, two in the area of administration and 14 in health. Most of these professionals had not taken a specialization or other course related to elderly care (n=20, 68.9%). The average time spent working in the institution was 4.8 years (± 4.53).

Chart 1 demonstrates the divergent central ideas that were explored extensively in workshops, and are better understood.

Chart 1. Central ideas (CI) and Discourse of the Collective Subject (DCS) of care professionals about the care they provide in an LTCF in Marília, Sao Paulo, Brazil, 2016.

CI*	DCS**
Timed and systematic care	It is very busy, the day goes very quickly, it's hard. So, you have to work with a timetable in here, because otherwise you won't manage it, if you don't establish times for things, you won't be able to provide care. It isn't like a private facility, here there's bath time, coffee time, everything has a schedule. We follow the pattern of the institution. During the day it means it's quite systematic, because it has to be, I've worked during the day and when you go into one room someone in the other room is already calling you. (P1, P4, P6 to P8, P14, P15, P17 to P23, P25 to P29)
Team care	It's gratifying, you have to pay attention to everything, every detail, and we're a team here, when someone needs extra help, we're a partnership. Every shift does their job so they don't leave a mess for the next one. (P19, P24)
Longitudinal Care	I try to carry out longitudinal follow-up care more slowly, there is no established routine for re-assessment, but as often as I can I do [...] a longitudinal follow-up. (P5)
Quality basic care	You have to pay attention to everything, every detail. For example, it's very important to talk when they're having a shower, not just put them in there and leave. You have to have a different way of looking at things. It's care for hygiene. We take care so they don't run away, or hurt themselves, or fight among themselves. (P1, P4, P19, P21)

*Central idea; **Discourse of the Collective Subject.

In order to broaden this discussion during the workshops, after the validation of the central idea by the participants, the researcher asked if this form of "producing care" affected the quality of care and how it was provided. Based on this question, two contradictory categories emerged: "did not affect the quality of care" and "affected the quality of care".

The care professionals did not believe that the quality of the care was affected, as, from their perspective, they fulfilled all their proposed activities:

> "I don't think it's affected. We don't leave anything undone, even when we're busy. [...] they never miss out on their baths [...] "(P1)

> "No, I don't think it means it's mechanical. I think it has a routine, like any other place [...]" (P7)

In contrast, the contradictory "affected the quality of care" category reflected the view that care is impaired not in relation to the techniques applied, but in terms of meeting the needs of the elderly, which is part of a concept of care and assistance focused on said techniques.

> "[...] ends up becoming more mechanical. Because when you start you know that this bath is in that corridor, and you're going to spend this much time, and that bath is in that corridor, and you're going to spend this much time. It becomes mechanical. There's no way around it [...]". (P8)

The DCS relating to teamwork showed this to be a potential strength of the institution. However the workshops revealed a certain fragmentation of care, as seen in the following statements:

> "Each shift does a completely different thing, [...] most of the time they don't warn you, when you arrive, [...] we aren't aware what's happening". (P10)

Although the problem of communication appeared to a limited degree during the interviews, in the workshops it was described as a difficulty encountered by the care professionals in the daily life of the institution, and affected the provision of care. As a strategy to overcome the challenge, they proposed improving communication using visual tools, such as the creation of a manual with the purpose of standardizing the care provided to the elderly. However, they did not suggest the possibility of constructing forms of dialogue among themselves when performing daily activities.

The DCS expressed in the CI "quality basic care" involves a social representation of care associated with eating, talking and bathing, reducing the concept by disregarding important ideas such as the co-responsibility of the subject and stimuli for autonomy.

The CI related to longitudinal care reveals that the continuity of care is due to the fact that some of these elderly people have resided in the institution for more than 20 years. Although this is described as a potential strength of the care process, it does not necessarily involve the proposed implementation of integral care, as the care provided is focused on techniques and not on the people and their perceived needs, nor on the autonomy of the subject.

The perception of managers of the care provided at the LTCF is presented in Chart 2.

The CI "humanized care" introduces a collective subject who considers characteristics of humanization to be those related to the interaction between the elderly person-care professional binomial, for the "survival" of the elderly.

The CI "preparation of care professionals" refers to the effectiveness of the professionals when dealing with the problems raised, and was validated in the workshop through the following extract:

> "[...] they show it when they like an employee [...] they don't say anything, but we can see it, they say 'she takes good care of me' [...]. So it's because they must like it ... especially the ones who are more like children, they are authentic [...]. " (G2)

However, representations of care and its delivery can result in the development of dominating relationships between caregivers and care recipients. From this vertical relationship, the resolutive approach described by the managers does not always involve the contemplation of the needs of the residents. This verticalization is reinforced by the representation of the elderly person as a "child" and not someone who can make decisions about their own needs.

With the intention of obtaining a deeper understanding of the provision of care by the professionals in the LTCF, they were asked what changes they thought were required in their training, the institution and their work.

Chart 3 highlights the required changes in the work process and in the institution (LTCF).

The changes required are those associated with changes in the work process, supported by the need for family involvement to achieve quality care for the elderly. Specific training to work in the LTCF, more care professionals in the institution and improvements in the process of communication between the care professionals and management were identified as requirements. In this sense, the DCS reveals the view that increasing the number of care professionals would improve the quality of care. From this perspective, the workshops allowed the identification of a category related to "work burden", both physical and psychological:

> "[...] just a little overburdened. Because in the morning, there is a lot of going to the doctor, taking showers, we end up doing it alone [...]" (P13)

In Chart 4 the care professionals discuss their proposals for changes in training so that they can perform their professional practice better.

Chart 2. Central idea and Discourse of the Collective Subject of the managers on what they consider to be criteria for the quality of the care provided in an LTCF, Marília, Sao Paulo, Brazil, 2016.

CI*	DCS**
Humanized care	The most important quality is humanization. Here they treat the elderly in a way that makes them feel like they're at home. After all, you aren't fiddling with a plant, so if you don't like it, if you have no patience, look for another job. (M1 and M3)
Physical conditions of the elderly and the environment	Everything is always clean [...]. It's always clean, they don't smell, they're always clean. The rooms are clean, they smell of someone who's had a bath, the general area is clean, the kitchen is always spotless, the quality of the food is good and also we always follow the guidelines of the doctor responsible for the treatment of the elderly. (M2; M3 and M4)
Preparation of care professionals	The elderly are very well looked after [...] and they don't want to leave because they must like it. The staff are very attentive, they bring both problems and solutions. There are some excellent employees who wear the uniform of the institution, in return, we try to give all the staff the best working conditions to provide the best care. (M4)

*Central idea; **Discourse of the Collective Subject

Chart 3. Central Idea and Discourse of the Collective Subject of care professionals about changes required in their work and in the LTCF, Marília, Sao Paulo, Brazil, 2016.

CI*	DCS**
Doesn't believe change is required	I haven't noticed, I think I'm doing my job. I feel fulfilled, I love what I do. And things are great the way they are. At least in my area I don't think they're needed. There was a time we even thought they were, but today everything is ok and I'm content where I am. (P2, P6, P7, P8, P9, P10, P11, P12, P13, P14, P15, P16, P17, P19, P26)
Greater availability of time	I need more time actually, I can't perform all the activities I have to organize and the monitoring I do ends up being segmented at various times. I would like to have more time to talk to them, give them a little more attention, which they like, give them affection and they end up feeling it, the lack of that part of care. [...] because they're the most needy, to talk, to give them a hug. [...] because during the day the work is very mechanical, there's a lot to do [...]. (P1, P3, P5, P18, P20, P21, P22, P23 P24, P28)
More care professionals	To meet people's needs, you would need more care professionals for specific tasks. [...] I could do everything and I would have more time to sit down and talk, cut their nails, do their nails and talk to them, have fun. And it gets hard, a lot of them are bedridden. (P1, P2, P5, P7, P18, P21, P22, P23, P24, P25, P29)
Need for more training	I need to know more and I'm even looking to take other courses to see if they bring anything new, to add to our knowledge. [...] However, we have already tried to have more training, but it is not easy to understand the thinking of the paid staff. If there is no financial benefit, they don't look kindly on it. (P4, P5)
Greater participation of family of elderly person	I'd request more care from the family. It's the lack of a family that makes the work difficult. (P4, P25)
Better interprofessional communication and communication with management	Communication with both colleagues and upper management. It would improve working together. More dialogue for the betterment of the elderly themselves. (P15, P26)
New ways to stimulate the cognitive process of the elderly	I would change how we manage care, the ways of interacting, there should be other ways to stimulate the cognitive process of the inner self. But we can't do it, due to a lack of training, a lack of space, a lack of creativity, because they want to establish other routines, due to a lack of knowledgeable personnel in this area ... I would bring in someone to read, tell a story, perform theater, something, people who can get their attention, because they can't just sleep all the time. (P5, P19, P28)

*Central idea; **Discourse of collective subject.

Chart 4. Central ideas and Discourse of the Collective Subject of care professionals about changes needed in professional training, Marília, Sao Paulo, Brazil, 2016.

CI*	DCS**
Doesn't believe change is required	I don't think so, they addressed everything. First we learned through theory, then in practice, then back for more theory, I think it has to be like this anyway. (P2, P19, P29)
More time allocated to practical activities	I didn't have much of this training in internships. In theory you should see the role of the professional, but in practice you don't. So, I think there should be a bigger practical part. If the course had more of this, we would graduate having learnt more. It focuses a lot on theory and there's a difference between what you read in a book and what you get in practice at the hospital, which is so busy. (P1, P18, P21 to P24, P27)
Specific gerontological care related content	There was nothing about the elderly on my nursing course. And if you had geriatrics, there was no follow-up care, no specific elderly person to care for or to let you understand how it is. There isn't much time allocated to the subject, they do it because they have to teach that content, but it's basic care, a little psychiatry [...]. The care is described in general terms and they describe the patient as a single thing, child, adult, elderly person, but they aren't as specific as the care here. [...] There the focus isn't on the patient and here it is on the elderly person, it's different. (P1, P4, P18, P20, P22, P23, P25, P26)
Content specific to care in the LTCF	It's rare to find a university which has contact with an LTCF, because it is a different management structure from the outpatient clinic, or hospitalization, or home visits. Because you deal with the psychological aspect, with the issue of abandonment. The aspect of social fragility, at times, is preponderant in the care of the person. So you have to know how to focus on that person's needs, you control your urge to treat everything at all costs, because it's impossible. You have to manage your anxiety better [...]. So, I think if the students had longitudinal contact with this, I think it would add something [...]. Of course, the number of people who work with LTCFs is very small, so this might not be of interest to the academic director, but on the other hand, when you need it, it's a shock. You end up having to figure out what you're going to do alone. " (P3 and P5)
Availability of refresher courses and exchanges between professionals	There should always be refresher courses and updates [...] everybody could pass on a new experience. (P28)

*Central idea; **Discourse of the collective subject.

In terms of the changes required in LTCF care training, there was a need for "more practical activities" as there was a "lack of practical training", a view also expressed in the workshop. According to the DCS, the subjects did not experience practical activities in their training that allowed them to reflect on care, and the theoretical focus was their sole or main source of training. This also demonstrates that the care professionals did not receive training in either general or specific care for the elderly.

In this context, in the views of these professionals, this lack of practical experience causes difficulties when they join the labor market, which is evident in the category "professional insecurity":

> "[...]I see that those who come from a course, they're so nervous, so I try to make them feel more confident". (P6)

The central idea "Specific gerontological care related content" reveals a subject who did not study content specifically related to care for the elderly in their training, with the subject discussed superficially in broader disciplines such as adult health, medical-clinical care and other areas. This consolidates what was presented in the anchor "the theory is different from the practice" addressed in the previous question.

In the CI "Content specific to care in the LTCF", the collective subject describes how it is rare for a higher education course to feature the LTCF as a context of professional practice, or to address the specificities of this modality of care.

DISCUSSION

Both the interviews and the validation of the data in the workshop revealed that the LTCF workers consider their form of caring to be timed, fragmented and systematic. This has its roots in the industrial revolution and is related to the development of Fordist/Taylorist production models, based on division by tasks and, consequently, the automation of production. Thus, the fact that the workers identified this model, which is widely criticized but still exists, shows that there is little space for reflection on what they are producing, and that this process of care is deeply rooted in professional services and practices[17]. This is also clear when the professionals describe the need for changes in interprofessional communication and institutional management.

In contrast, in the view of the managers, care is provided in a humanized manner. They describe the patience involved, the fact that hygiene needs are met, and refer to the commitment of the professionals who perform the care, stating that problem solving occurs. For the professionals, care requires attention to detail, such as looking closely for any disorders or changes during bathing, and taking care that the elderly do not injure themselves. In the context of the National Humanization Policy, the humanization of care strengthens the accountability of all those involved in order to construct the autonomy and protagonism of the individuals and groups that permeate it[18].

It can therefore be seen that the concept of humanization and care presented by managers and professionals is not related to this policy, as the assistance-based perspective and verticalization of care perpetuates in the LTCF, assigning a passive role to the elderly, rather than the status of protagonist established by the policy. This verticalization is reinforced by the representation of the elderly person as "a child".

This infantilization presupposes a paternalistic attitude, which in the LTCF scenario is permeated by the concepts of charity and benevolence that conflict with the reference in gerontological care, which emphasizes the importance of autonomy and independence[19].

It is therefore verified in the views of both the care professionals and the managers that the manner of delivering care, has characteristics focused on the assistance-based and charitable approach, disregarding a specific and extended formation of care for the elderly person. One of the determinants that cause this care process to occur in a fragmented and unspecified manner is based on the initial training of workers. The present study reveals that this training focuses on the approach to adult health care, but disregards gerontological care and its specificities. It should also be noted that the LTCF has not been chosen as a potential learning possibility for activities carried out during undergraduate or technical-vocational education.

Literature reveals that even in higher education courses, professionals have little contact with practices of gerontological care, especially care in the context of the LTCF[12,20].

Costa et al[21] analyzed the National Curricular Guidelines (NCG) of 14 undergraduate careers in the area of health, approved between 2001 and 2004, and identified that in nursing and some other careers there are indications of advances in the practice, management and organization of care expressed in the NCG, which propose the training of critical and reflexive professionals who are ethically responsible for the processes of changes in the contexts lived. Gerontological care does not specifically appear in the NCG.

There are challenges to guide curriculum development based on best practices, taking into account the integration and articulation of the world of work and training, with interprofessional and interdisciplinary practices, seeking the creation of singular projects which are supported in social needs.

In this sense, the nonspecific form with which care for the elderly is considered in the NCG of the health professions, compromises the insertion of this content in the pedagogical plans of courses, and fails to promote new perspectives on gerontological care[22,23]. The only NCG of health courses that addresses the need to insert the undergraduate student in this setting is that of the medical course[23], published in 2014.

The NCGs of health courses are currently being reviewed, which may allow for new approaches regarding gerontological and LTCF care, as well as the teaching-learning process. It is not only a question of inserting technical care, but rather of approaching the individual from the perspective of integral care, using low, low-high and high intensity technologies. It is necessary to consider the problems arising from epidemiological and demographic transitions and to adopt active teaching-learning methods in order to construct meaning for the content learned, and for professionals to carry out their work through shared management and interprofessional practices, creating subjects in care who are able to decide upon their own needs.

Another important aspect is the view of the managers about the training of the care professionals inserted in the LTCF. When considering that the elderly require care for their hygiene, food and affection, they disregard the specific dimensions of gerontological care, failing to mention that care professionals require such dimensions. This can be attributed to a lack of specific training in management, as these individuals occupy the position voluntarily, without being professionally trained to work in the LTCF[8], but is also explained by the conception they have about the purpose of the LTCF, which is seen as being assistance-based and charitable.

In the workshops the care professionals identified gaps in their specific training for care of the elderly and proposed permanent education in health (PEH) as a strategy to overcome the difficulties encountered in professional practice, a suggestion supported by the statement: "*maybe something once a month, a quicker thing* [...]. " (P7)

It is worth noting that the way in which the teaching-learning process has been constituted in health-centered courses, centered on teachers and the transmission of content, does not favor lifelong learning. PEH can provide strategies for professionals to reflect on their practice and to seek new knowledge from the necessities they have experienced during their professional lives, and can also allow them to collectively construct new strategies and practices[24]. For Freire, teaching cannot be reduced to the transference of "knowledge", but should mean allowing the student to generate their own way of thinking, giving meaning to what is learned [25].

Although some LTCFs emphasize that they carry out sporadic training of caregivers, arguing that that more frequent training is unnecessary and citing a lack of financial and professional resources, such approaches are still focused on techniques, first aid and nutrition[26]. It is important to extend approaches to the elderly during the aging process, through expanded clinical care and the humanization of care, building new meanings for care in the LTCF through the work of care professionals and managers, in order to overcome the charitable and assistance-based vision of institutions.

There is an urgent need for the prioritization of the elderly in the elaboration of public policies directed at the quality of the services provided, through intersectoral actions that result in better-qualified care for those in the LTCF[27].

CONCLUSION

The care professionals in the LTCF described a fragmented and mechanical working process, with communication difficulties and a lack of continuity between the activities of different shifts, and stated that care is longitudinal in the sense that the elderly remain in the institution for many years.

The managers of the institution use the conditions necessary for the survival of the elderly (food, cleanliness and humanization) as a reference for the quality of care, and state that it is important for care professionals to have patience when performing their actions. However, neither care professionals nor managers consider the possibility of the elderly person as an active subject in the care process.

The training of the professionals who work in this LTCF has not contributed to changes in care for the elderly. The focus of training is still on the health of adults, with little specificity towards the elderly and little or no attention paid to the institutionalized elderly. It was also observed that these professionals, as well as not studying specific content about gerontological care, continue to learn to care in a fragmented manner, disregarding the integrality of

the subjects in the approaches performed in training scenarios, which are more frequently set in hospital-type institutions.

Another problem identified is the disarticulation of training from the world of work. In other words the teaching-learning processes and contents are not based on social health needs. Courses at a technical or higher level do not have the support of a professional strategy that contemplates changes in health care settings, in the form of integral practice, with co-responsibility and the vision of subjects as autonomous and conscious decision making individuals who can provide different perspectives to the view the care professionals have of the elderly.

There is therefore an urgent need to revise the National Curricular Guidelines and course pedagogical plans, at technical as well as undergraduate and graduate levels, expanding and sustaining professional practice in the area of health. These should contemplate the needs and demands of the process of demographic transition in Brazil, focusing on the creation of technologies that overcome these needs and that are based on the concepts of integrality of care and collective management, modifying the limiting conceptions of the health-disease process and fragmentation in the health work process.

Permanent Education in Health is a powerful strategy for reflection on professional practice, both in education and in work, constituting a space for the elaboration of propositions of change.

There is a need to broaden research in secondary and higher education institutions to better understand approaches towards the training of professionals to provide care for the elderly and the specific needs of working in a Long-Term Care Facility for the Elderly.

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Association between number of medications used and nutritional markers among elderly persons with chronic diseases: National Health Survey (2013)

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Abstract

Objective: to evaluate the association between the number of medications taken and nutritional markers in Brazilian elderly persons diagnosed with chronic diseases. *Method:* study based on data from the National Health Survey (PNS) 2013, for the population aged 60 years or older who reported at least one chronic disease (hypertension, diabetes *mellitus,* heart disease, stroke, arthritis, depression, lung disease and chronic renal failure) (7,770 elderly persons). The outcome was the number of medications used for the selected diseases (0, 1 to 2 and 3 or more), and the exploratory variables were food consumption markers and anthropometric indicators (body mass index, waist circumference and waist-to-height ratio). The associations were evaluated by multinomial logistic regression, estimating the odds ratio and confidence intervals (95%) and considering potential confounding factors. *Results:* the use of a greater number of medications was positively associated with the consumption of fruits and vegetables, fish and milk, and negatively associated with the consumption of sweet foods, soft drinks and meat with excess fat; a greater consumption of medications was also associated with higher anthropometric indicator values. *Conclusion:* although a greater consumption of medications was associated with better dietary indicators, these elderly persons also had higher anthropometric indicator values, including a higher concentration of central adiposity.

Keywords: Health of the Elderly. Drug Utilization. Food Consumption. Nutritional Status. Health Surveys.

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INTRODUCTION

Population aging has contributed to an increase in the prevalence of Chronic Non-communicable Diseases (CNCD) and, consequently, a growth in the concomitant use of various medications[1]. The intake of multiple medications can affect eating behavior and, consequently, nutrient absorption, contributing to the emergence of nutritional disorders in the elderly and increased morbidity and mortality among this group[2,3]. However, there is also evidence that poor nutritional status leads to a need for the prescription of multiple medications, causing a vicious cycle that causes significant health impacts among this population[3].

However, the association between the use of different medications and the nutritional status of the elderly has not yet been fully established in literature[4,5]. Nevertheless, evidence shows that medication use is associated with changes in food intake[6] and various nutritional disorders, such as weight loss[7] and obesity[5]. These findings demonstrate that, even if the actual temporal relationship between these events is unknown, there exists a synergistic relationship between them, leading to the greater vulnerability of the elderly when using multiple medications and/or undergoing nutritional deficiencies, which should be addressed by health services[2,3,8,9].

In this context, and based on the understanding that healthy eating may be a fundamental non-pharmacological measure for the treatment of chronic diseases[6], it is important to study the association between the use of polypharmacy, diet and nutritional status, especially in the population with CNCD, which is still little explored in Brazil[9]. This knowledge may help the multiprofessional teams that accompany this group of elderly people when proposing interventions and so avoid other health complications[3]. The objective of the present study was therefore to verify whether markers of food consumption and anthropometric indicators vary in relation to the number of medications consumed by Brazilian elderly persons diagnosed with chronic non-communicable diseases.

METHODS

Study population

A cross-sectional study was performed using data from the National Health Survey (PNS), carried out throughout Brazil in 2013 by the Brazilian Institute of Geography and Statistics (IBGE), in partnership with the Ministry of Health and the Oswaldo Cruz Foundation (FIOCRUZ). The National Health Survey was approved by the National Commission for Research Ethics (CONEP) in 2013 (Process nº 328.1590) and all the participants signed a free and informed consent form[10].

Sampling was carried out in three stages: the primary units were the IBGE census tracts, the secondary units were the households located in these sectors and the tertiary units were the randomly selected adult residents among all the eligible individuals aged 18 years and over residing in the sampled household. The data were collected through structured questionnaires and physical measurements, which were performed in the sampled households[11].

For the present study, 7,770 participants aged 60 years or older were selected, who reported having at least one of the following CNCDs: arterial hypertension, diabetes mellitus, heart disease, cerebral vascular accident or stroke, arthritis or rheumatism, depression, lung diseases and chronic renal failure. The diagnosis of these diseases was ascertained by the question *"Have you ever been diagnosed with … by a doctor*?" for each of the above mentioned chronic conditions. For depression, the question "*Has a doctor or mental health professional psychiatrist or psychologist ever diagnosed you as suffering from depression*?" The variable number of chronic diseases was used to characterize the sample included in the analysis.

Variables and collection procedures

The outcome of interest (dependent variable) was the number of medications used for the selected chronic diseases. Following an affirmative answer regarding the presence of the disease, respondents

were asked about the use of medications for each of these conditions: "*In recent weeks have you taken medications because of arterial hypertension (high blood pressure)?*"; "*In the past two weeks, because of diabetes did you: (I) take oral medications to lower your blood sugar levels (II) use insulin*?". For the other conditions, the question was: "*What do you currently do because of*...?", "*Do you take medication?*". The participants were then classified into three groups: did not use medication, used medication for one to two chronic diseases, used medication for three or more reported chronic diseases.

The independent or exploratory variables were the markers of food consumption (fruits and vegetables, fish, beans, sweet foods, soft drinks or artificial juices, milk, salt and fatty meat) and anthropometric indicators (body mass index [BMI] ,waist circumference [WC] and waist to height ratio [WHR]). The intake of fruits and vegetables was evaluated by the weekly frequency of the intake of fruit and/or lettuce and tomato salad or salad of any other vegetable or raw legume and/or vegetables or cooked vegetables (except potatoes, cassava or yams), with a minimum frequency of five times a day, at least five days a week considered the recommended intake of these foods. The regular intake of fish (once or more per week), as well as of beans[12], sweet foods and soft drinks/ artificial juice (five or more days per week) were also considered. To evaluate milk intake, the type of milk consumed (not consumed, full-fat milk, skimmed or semi-skimmed consumed) was considered. Salt intake was assessed by the individual's perception of freshly prepared food and processed foods (adequate/low/very low and high/ very high). The intake of fatty meat was evaluated by the report of the intake of red meat and/or chicken, without removing the visible excess fat or the skin, respectively[13].

The anthropometric indicators were estimated by direct measurements, obtained by standardized equipment and techniques, while the individual was standing erect and unassisted. To measure weight, a portable digital scale was used, and for the measurement of height a portable stadiometer was employed. The individuals stood upright, were barefoot, wore light clothing and removed any accessories (glasses, belts, necklaces, etc.) or objects (purse, wallet, cell phone, etc.). Waist circumference (WC) was measured using a non-elastic and flexible tape measure. The reading was made at the midpoint between the last rib and the iliac crest at the end of a normal exhalation. BMI was defined as the ratio of weight in kilograms to the square of the height in meters (kg/m^2). The waist-to-height ratio (WHR) was obtained by dividing the WC by height (cm). To facilitate the interpretation of the measures of association (multinomial logistic regression), the WHR was multiplied by 10[14].

Potential confounding factors included socio-demographic characteristics (gender, marital status and schooling), health behaviors (alcohol consumption, current smoking and physical activity in leisure time), health conditions (self-assessment of health) and number of medical visits in the last 12 months. Alcohol intake was categorized as "non-intake", light/moderate intake (between one and seven units/week for women and one to 14 units/ week for men) and at-risk intake (more than seven units/week for women and more than 14 units/week for men), based on the reference values proposed by the National Institute on Alcohol Abuse and Alcoholism[15]. Current smoking was assessed by the current consumption of any tobacco product (no/ yes) regardless of frequency. Elderly persons who carried out at least 150 minutes of mild or moderate physical activity or at least 75 minutes of vigorous weekly physical activity in their leisure time were considered physically active[16]. The use of health services and health condition variables included the number of medical visits in the last 12 months prior to the interview (less than three and four or more visits) and self-assessment of health (good/excellent, fair and poor/very poor).

Data analysis

A description of all the variables included in the study was carried out for the total population, based on the categories of medication intake considered. The comparison of the distribution of these variables between the categories of the dependent variable was performed using the Pearson chi-squared test (categorical variables) or linear regression (continuous variables).

Multinomial logistic regression was used to obtain estimates of the odds ratios (OR) and their respective 95% confidence intervals in order to verify the association between medication use and markers of nutritional condition. Three models were constructed, with the progressive inclusion of the confounding variables: the first model included the sociodemographic variables (gender, age, marital status and schooling); in the second model the variables of health behavior (alcohol consumption, current smoking and practice of physical activity in leisure time) were added; in the final model, the number of health appointments in the last 12 months and self-assessment of health were added.

The Stata® (StataCorp LLP, College Station, Texas, USA) version 13.0 software package was used for all the analyses, taking into consideration the complexity of the National Health Survey sample plan[12].

RESULTS

Among the 11,697 elderly participants of the National Health Survey, 10,537 included information on the selected variables and 7,770 reported having one or more chronic disease and were included in the present analysis. Of these, 17.6% (95% CI: 16.2-19.2%) did not use medications for the diseases selected, 71.1% (95% CI: 69.3-72.8%) used medications for one two of these diseases, and 11.3% (95% CI: 10.1-12.6) used medications for three or more diseases.

Table 1 shows the characteristics of the population studied and their distribution according to the number of medications consumed, among Brazilian elderly persons with CNCD. There was a predominance of female, younger, married individuals, with a low level of education, who did not use alcohol or tobacco, were not active in their leisure time, had less than four health appointments in the previous 12 months, and had a fair self-perception of health and two or more chronic diseases. The number of medications consumed had a significant association (p <0.05) with gender, age, alcohol intake, current smoking, number of medical consultations, self-assessment of health and number of chronic diseases investigated.

Table 2 shows the distribution of food consumption markers and anthropometric indicators for the total population and according to the number of medications used, among Brazilian elderly persons with CNCD. There was a predominance of elderly people who did not meet the recommended intake of fruits and vegetables but regularly ate fish and beans. The majority of the elderly consumed sweet foods and soft drinks on fewer than five days per week and had a greater consumption of full-fat milk. There was a predominance of elderly persons who reported the fair, low, or very low consumption of salt and who did not eat fatty meat. The mean and standard deviation variables for the anthropometric indicators are shown in the table. In general, the groups that reported taking medications had significantly higher proportions of fruit/vegetable and skimmed/semi-skimmed milk intake, as well as lower consumptions of sweet foods, soft drinks or artificial juices and meat with excess fat. On the other hand, the mean BMI, CC and WHR values were significantly higher in these groups, compared to elderly persons who did not report using medications for the selected chronic diseases.

Table 3 shows the associations between the number of medications consumed and the markers of food consumption and anthropometric indicators, with and without adjustment for the confounding variables considered in the study, among Brazilian elderly persons with CNCD. Considering the model adjusted for all the confounding factors included in the study (Model 3), it was observed that the elderly persons who used three or more medications had a greater chance of consuming fruits and vegetables five or more times a day on five or more days/week, fish on one or more days/week and full-fat or skimmed milk, in addition to a lower chance of consuming sweet foods on five or more days/week and fatty meat. Elderly persons who consumed one to two medications had a lower chance of consuming sweet foods and soft drinks or artificial juice on five or more days/week and fatty meat, as well as a greater chance of consuming skimmed/semi-skimmed milk. The anthropometric indicators exhibited a consistent association in both groups, regardless of the confounding factors considered, with higher values among the elderly who reported taking any number of medications.

Table 1. Socio-demographic characteristics, health behaviors, health conditions and use of health services among Brazilian elderly persons, according to the number of medications consumed. National Health Survey (2013).

Variables	Total (%)	Use of medication (%)			Value *p*[1]
		None	1 to 2	3 or more	
Gender					<0.001
Female	59.0	45.9	62.1	60.4	
Male	41.0	54.1	37.9	39.6	
Age in years					0.009
60-69	54.5	61.7	53.5	49.0	
70-79	31.0	25.5	31.8	35.0	
80 or +	14.5	12.8	14.7	16.0	
Marital status					0.969
Married	53.2	53.3	53.3	52.6	
Unmarried	46.8	46.7	46.7	47.4	
Schooling					0.162
Secondary or above	20.0	17.5	20.9	18.0	
Primary or below	80.0	82.5	79.1	82.0	
Alcohol intake[2]					<0.001
Non-intake	87.4	80.9	88.3	92.3	
Mild/moderate intake	8.5	11.4	8.2	5.9	
At risk intake	4.1	7.7	3.5	1.8	
Current smoker					<0.001
No	88.4	76.8	91.2	88.5	
Yes	11.6	23.2	8.8	11.5	
Physical activity in leisure time					0.613
Active[3]	13.0	12.0	13.4	12.3	
Inactive	87.0	88.0	86.6	87.7	
Number of medical appointments in previous 12 months					<0.001
0 to 3	53.7	73.4	53.0	26.6	
≥4	46.3	26.6	47.0	73.4	
Self-perception of health					<0.001
Good/excellent	36.4	46.9	37.2	15.0	
Fair	48.8	42.3	49.1	56.3	
Poor/Very poor	14.8	10.8	13.7	28.7	
Number of chronic diseases					<0.001
1	49.3	81.6	51.7	0.0	
≥2	50.7	18.4	48.3	100.0	

[1]Pearson's chi-squared test *p*-value; [2]Mild/moderate: 1 to 7 units/week for women and 1 to 14 units/week for men; at risk intake: more than 7 units/week for women and more than 14 units /week for men; [3]At least 150 minutes of light/moderate activity or 75 minutes of vigorous activity per week.

Table 2. Distribution of food consumption markers and anthropometric indicators among Brazilian elderly persons with chronic diseases, according to the number of medications consumed. National Health Survey (2013).

Variables	Total[1]	Medication intake[1]			*P*-value[2]
		None	1 to 2	3 or more	
Recommended intake of fruit and vegetables					0.002
No	74.5	80.6	73.7	70.2	
Yes	25.5	19.4	26.3	29.8	
Regular intake of fish					0.165
No	42.9	45.4	43.0	38.2	
Yes	57.1	54.6	57.0	61.8	
Regular intake of beans					0.109
No	28.2	28.3	27.4	33.0	
Yes	71.8	71.7	72.6	67.0	
Regular intake of sweet foods					0.002
No	83.4	77.2	84.2	87.8	
Yes	16.6	22.8	15.8	12.2	
Regular intake of soft drinks or artificial juices					0.009
No	88.3	84.0	89.2	89.7	
Yes	11.7	16.0	10.8	10.3	
Milk intake					<0.001
Does not drink	21.3	27.4	20.7	15.4	
Drinks skimmed or semi-skimmed milk	21.5	12.6	22.3	31.0	
Drinks full-fat milk	57.2	60.0	57.0	53.6	
Salt intake					0.647
Adequate/low/very low	92.9	91.8	93.1	93.3	
Very high/high	7.1	8.2	6.9	6.7	
Intake of meat with excess fat					<0.001
No	73.6	63.2	75.6	77.0	
Yes	26.4	36.8	24.4	23.0	
Body mass index (kg/m^2)[3]	27.3 (5.1)	25.9 (5.3)	27.4 (5.0)	28.2 (5.1)	<0.001
Waist circumference (cm)[3]	96.9 (12.8)	93.0 (13.4)	97.4 (12.5)	99.9 (12.3)	<0.001
Waist-height ratio[3]	0.61 (0.1)	0.58 (0.1)	0.61 (0.1)	0.63 (0.1)	<0.001

[1]Values expressed as percentages, except where specified; [2] *p*-value of Pearson's Chi-squared test or linear regression F-test .; [3]Values expressed as means (standard-deviation).

Table 3. Associations between use of drugs and food consumption markers and anthropometric indicators among Brazilian elderly people with chronic diseases. National Health Survey (2013).

Variables	Gross Model[1]		Model 1[1]		Model 2[1]		Model 3[1]	
	Number of medications		Number of medications		Number of medications		Number of medications	
	1 to 2	3 or more	1 to 2	3 or more	1 to 2	3 or more	1 to 2	3 or more
Recommended intake of fruit and vegetables	1.48 (1.15-1.90)	1.76 (1.25-2.47)	1.36 (1.05-1.75)	1.69 (1.19-2.41)	1.26 (0.98-1.63)	1.61 (1.13-2.29)	1.24 (0.96-1.61)	1.64 (1.15-2.35)
Regular intake of fish	1.10 (0.89-1.37)	1.35 (0.98-1.84)	1.10 (0.88-1.92)	1.37 (0.99-1.89)	1.05 (0.85-1.32)	1.35 (0.98-1.87)	1.07 (0.86-1.35)	1.45 (1.04-2.00)
Regular intake of beans	1.05 (0.84-1.29)	0.80 (0.59-1.09)	1.13 (0.92-1.40)	0.85 (0.62-1.16)	1.17 (0.95-1.45)	0.87 (0.64-1.18)	1.19 (0.96-1.48)	0.89 (0.64-1.22)
Regular intake of sweet foods	0.64 (0.49-0.83)	0.47 (0.32-0.70)	0.63 (0.48-0.82)	0.47 (0.32-0.69)	0.66 (0.51-0.87)	0.49 (0.33-0.73)	0.67 (0.51-0.89)	0.52 (0.34-0.80)
Regular intake of soft drinks or artificial juices	0.64 (0.48-0.85)	0.60 (0.37-0.98)	0.67 (0.51-0.89)	0.64 (0.39-1.03)	0.72 (0.54-0.95)	0.67 (0.42-1.09)	0.71 (0.53-0.94)	0.66 (0.40-1.13)
Intake of skimmed or semi-skimmed milk	2.34 (1.69-3.23)	4.35 (2.76-6.87)	2.03 (1.47-2.81)	4.03 (2.53-6.41)	1.83 (1.30-2.56)	3.70 (2.33-5.90)	1.75 (1.25-2.46)	3.56 (2.56-5.63)
Intake of full fat milk	1.26 (0.99-1.26)	1.59 (1.08-2.34)	1.20 (0.94-1.53)	1.50 (1.02-2.21)	1.15 (0.90-1.47)	1.45 (0.98-2.15)	1.18 (0.92-1.53)	1.61 (1.08-2.41)
High/very high intake of milk	0.84 (0.58-1.20)	0.81 (0.44-1.48)	0.88 (0.61-1.28)	0.87 (0.48-1.59)	0.89 (0.61-1.32)	0.91 (0.49-1.68)	0.91 (0.61-1.35)	0.93 (0.47-1.82)
Intake of fatty meat	0.55 (0.44-0.69)	0.51 (0.37-0.71)	0.64 (0.51-0.80)	0.57 (0.41-0.80)	0.71 (0.56-0.90)	0.64 (0.46-0.90)	0.70 (0.55-0.88)	0.65 (0.43-0.86)
Body mass index	1.07 (1.04-1.09)	1.10 (1.06-1.13)	1.06 (1.03-1.09)	1.10 (1.06-1.13)	1.05 (1.02-1.08)	1.09 (1.06-1.13)	1.05 (1.03-1.08)	1.09 (1.06-1.13)
Waist circumference	1.03 (1.02-1.04)	1.04 (1.03-1.06)	1.03 (1.02-1.04)	1.05 (1.04-1.06)	1.03 (1.02-1.04)	1.05 (1.03-1.06)	1.03 (1.02-1.04)	1.05 (1.03-1.06)
Waist-height ratio	1.63 (1.41-1.90)	2.02 (1.68-2.45)	1.54 (1.33-1.79)	1.94 (1.60-2.35)	1.47 (1.26-1.71)	1.89 (1.57-2.29)	1.46 (1.25-1.71)	1.84 (1.50-2.25)

[1] Values expressed in Odds Ratio (95% confidence interval), obtained by multinomial logistic regression, considering non-consumption of medicines as a reference category. Model 1: adjusted by gender, age, marital status, schooling. Model 2: adjusted for the variables of the previous model, as well as smoking, alcohol intake and physical activity in leisure time. Model 3: adjusted for the variables of the previous model, as well as the number of medical consultations in the previous 12 months and the self-perception of health.

DISCUSSION

The results of the present study showed that 17.6% of elderly persons with CNCD did not take any medication for these diseases and 82.4% took medication for at least one of the diseases investigated. It was also generally observed that a greater use of medications was associated with more frequent intake of fruits and vegetables, fish and skimmed milk and less frequent consumption of sweet foods, soft drinks or artificial juices and fatty meat. In addition, elderly persons with the highest intake of medications had higher values for the anthropometric indicators evaluated.

Drug intake is high among Brazilian elderly persons, with consumption reaching between 2.1 and 4.7 medications per day[17-19]. This use has been reported to increase with age, similar to the findings of the present study[20]. It is known that some factors can contribute to the elevated use of medications in this population, such as non-adherence to non-pharmacological treatments for chronic diseases[5], the practice of self-medication, the incorrect use of medications, receiving prescriptions from different doctors, and inadequate understanding of medication instructions, due to the similarity in color, size or shape of the same[20]. Regarding diet, which was evaluated by food intake markers, the results showed that the use of greater numbers of medications was associated with better quality of diet among elderly people with CNCD. In general, a higher frequency of consumption of fruits and vegetables, fish and milk (full fat, skimmed or semi-skimmed) and a lower frequency of consumption of sweet foods, soft drinks or artificial juices and fatty meat was observed. In contrast to these results, a study among elderly people living in rural areas in the United States found that the use of more medications was associated with a greater intake of foods rich in cholesterol, glucose, sodium and the lower consumption of fiber[6]. On the other hand, a study conducted with patients aged 50 years or above from a hospital in Rome, Italy, found that the average amounts of medication used were significantly lower in patients who were more likely to consume four or more spoonfuls per day of olive oil, fish, legumes and vegetables, and a moderate consumption of nuts[21]. Among elderly residents in Goiânia (Goias), who were users of the Unified Health System, it was possible to observe a significant association between the use of multiple medications and reported dieting, although a significant specific association with the reported consumption of fruits and vegetables was not observed[5].

Despite these divergences, Brazilian and non-Brazilian studies have observed changes in the diet of the elderly, possibly due to changes in their health and disease patterns, with an increase in vegetable intake and a lower consumption of processed and sweet products[12-24]. In this sense, it is suggested that the group of elderly Brazilians with an increased use of medicines for chronic diseases may have been advised by health professionals to change their diet. This hypothesis is corroborated by the greater number of medical consultations among the elderly with a higher intake of medications, as observed in this study. These results therefore reinforce the need for health services to provide correct guidance on the use of medications and diet, considering the effects of interactions among these factors, which can lead to a reduction in the bioavailability of vitamins and minerals and significant nutritional deficits[6].

The values of the anthropometric indicators used to evaluate the nutritional status of the elderly in this study were higher among elderly persons who reported using more medications. A review study found contrasting results regarding the association between medication use and nutritional status, describing populations where the greater use of medication was associated with weight loss and others where such use was related to weight gain. These differences may be related to the quality, quantity and variety of food to which the elderly are exposed, length of medication use and type of medication, as well as the adverse effects of the drugs[4]. However, similar to the findings of the present study, an analysis of elderly users of the Unified Health System found that BMI was directly proportional to the prevalence of medication use[6]. Our results therefore reinforce this evidence and add to it by demonstrating that three anthropometric indicators were consistently associated with the number of medications used by this population. This evidence, therefore, shows that not only the general body mass evaluated by BMI but also the concentration of abdominal fat, which is associated with higher metabolic risks, was associated with the intake of a greater number of medications in

the elderly evaluated[5], demonstrating the importance of actions aimed at the control of these diseases and reinforcing the hypothesis that the use of a greater number of medications and nutritional disorders are related in both directions[2].

The consistent association between the number of medications used and the anthropometric indicators reveals the importance of monitoring the nutritional status of the elderly with CNCD by health services, as this evaluation can be carried out in a practical and noninvasive manner[25], and that nutritional status may influence the treatment process of these diseases[2]. This is an important aspect to be considered by health services, since the results described in the present study point to a better quality of food among elderly people with a greater intake of medications, but still show important differences in relation to body composition, which should be considered in the planning of intervention actions.

This study presents some limitations, such as its cross-sectional nature, which does not allow a temporal relationship between the variables to be established. Information on the use of medication was self-reported, which may have introduced an information bias, although previous research has already demonstrated the adequate validity of these questions[26,27]. In addition, questions about medication use were linked to the medical diagnosis report for each disease considered in this study, which could underestimate the number of medications used, since the respondent may use more than one drug for each condition assessed. Despite these limitations, the present analysis employed a population-based structure, and used standardized procedures and trained interviewers to collect data, which ensured the internal validity of the study[28].

CONCLUSION

In summary, the results suggest that the greater use of medications for chronic diseases among the Brazilian elderly was associated with a better quality diet, which may be attributed to the guidance of health professionals, but is still associated with higher values among the indicators, suggesting a higher frequency of overweight and/or obesity in this group, which may make it difficult to adequately control the chronic conditions in question. In view of this situation, the importance of the careful evaluation of the diet and nutritional status of elderly persons taking multiple medications for chronic diseases should be highlighted, as this practice can identify groups of greater vulnerability in relation to nutritional deficits, who should be continuously monitored by health teams aiming to adequately control these diseases.

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Demographic and clinical variables as differentiating predictors of cognitive disorders in Parkinson's disease

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Abstract

Objective: to analyze demographic and clinical variables as predictors of cognitive disorders in Parkinson's disease (PD). *Method:* a cross-sectional descriptive study was carried out at the Pro-Parkinson Program of the Hospital das Clínicas of the Federal University of Pernambuco. The instruments used were the Mini Mental State Examination (MMSE), Scales for Outcomes in Parkinson's disease - Cognition (SCOPA-COG), the Hoehn & Yahr Staging Scale (HY), the Unified Parkinson's Disease Rating Scale part 3 (UPDRS-III), and the 15-item Yesavage Geriatric Depression Scale (GDS-15). A multiple linear regression model was used for the predictive outcome and the Mann-Whitney test was used to compare the elderly and the non-elderly groups. *Results:* the sociodemographic data of 85 people were collected and the participants underwent a cognitive profile evaluation (MMSE and SCOPA-COG) and clinical evaluation (HY, UPDRS-III, GDS-15). Multiple regression analysis found significant results for age, work activity, and tremor index, explaining 59% of the variability of SCOPA-COG. There was an inverse correlation with age and work activity and a direct correlation with tremors. The SCOPA-COG and MEEM scores were significantly lower in elderly patients, with an emphasis on executive functions. *Conclusion*: the predictors of cognitive impairment were age, work activity, and tremors. Cognitive impairment was greater in elderly patients with PD, especially for executive functions.

Keywords: Aging. Cognition. Parkinson Disease.

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INTRODUCTION

The aging process can be accompanied by the onset of chronic diseases and the complications that accompany them. Parkinson's Disease (PD) and Alzheimer's Disease are the most prevalent neurodegenerative diseases that affect elderly people[1]. PD is characterized by the degeneration of the dopaminergic neurons of the compact part of the substantia nigra of the midbrain. Its main motor signs and symptoms are bradykinesia, rigidity, resting tremors and postural instability[2].

Individuals with PD also have a heterogeneity of cognitive deficits in their executive functions, language, memory and visuospatial ability, especially in older elderly persons with Parkinson's. This may be characterized by mild cognitive impairment (MCI) or even dementia[3,4]. Given this risk, early identification of the disease is necessary. Guidelines for the diagnosis of MCI and dementia in PD have already been proposed[5,6], but there remains a lack of well-validated criteria for the diagnosis of cognitive deficits in elderly patients with PD[7].

Advanced age, schooling, and clinical profile are some of the factors explored in studies of cognitive impairment in patients with PD[8-11]. However, the association between these variables and cognition, comparing groups of Brazilian elderly and non-elderly persons with PD, has yet to be performed.

The objective of the present study was therefore to analyze demographic and clinical variables as differentiating predictors of cognitive disorders in individuals with Parkinson's disease.

METHOD

A descriptive-analytical cross-sectional study was performed at the Neurology Outpatient Clinic of the Hospital das Clínicas of the Universidade Federal de Pernambuco (HC/UFPE) between January and June 2017, in association with the activities of the Pro-Parkinson's Program. Patients with a clinical diagnosis of idiopathic Parkinson's disease and satisfactory communicative levels, who had no other neurological diseases, had not undergone surgical interventions in the brain and were not receiving cognitive rehabilitation treatment were selected to participate in the program. The criterion used for the definition of elderly was 60 years of age or older at the time of evaluation. The sample size needed to estimate the mean SCOPA-COG with an accuracy of 1.2 points based on a confidence interval of 95% was 76 patients.

The Scales for Outcomes in Parkinson's Disease-Cognition (SCOPA-COG) and Mini Mental State Examination (MMSE), both validated for use with the Brazilian population, were used as instruments to collect data to assess cognitive profile[12,13].

The SCOPA-COG scale evaluates memory, attention, executive functions and visuospatial function, and was developed specifically for the evaluation of the cognitive domains in which patients with PD are frequently deficient[14]. The maximum score of 43 indicates better cognitive performance, while the cut-off point used to indicate dementia was 17[15], and that for the indication of MCI was 26[16].

The MMSE is the most widely used cognitive screening tool in Brazil and around the world, and was employed as a reference in this study. It assesses temporal and spatial orientation, short-term memory and recall, attention and calculation, and language and visuospatial skills[17]. The Brucki et al.[18] version was used in the present study, with 18 the cutoff point for dementia for illiterate individuals, 21 the cutoff for people with 1 to 4 years of schooling, 24 for those with 5 to 8 years of schooling and 26 for those with more than 8 years of schooling. The maximum score of 30 points indicates better cognitive performance[19].

A form was used to obtain the sociodemographic characteristics of the sample, with respect to age, gender, years of schooling, work activity, economic classification, comorbidities, and equivalent dose of L-dopa being used.

Work activity was divided into three categories G (1), G (2) and G (3), with group G (1) composed of professions with higher cognitive demands and G (3) those with lower demands. Professions in G1 included: science and arts professionals, managers, mid-level technicians; G2: administrative service

workers, vendors and service providers, artisans and production workers, machine operators and assemblers, members of the armed forces; and G3: agricultural workers, housewives and manual workers.

Economic classification was defined according to the updated 2016 criterion of the Associação Brasileira de Empresas de Pesquisa (the Brazilian Association of Research Companies)[20], which defines socioeconomic strata based on the possession of goods, access to water, the state of the street where the home is located and educational level of the head of household. Each item receives a score, the sum of which varies from 1 to 100 and indicates the stratum to which the individual belongs. Stratum A corresponds to the highest average household income, while B1 and B2, C1 and C2, and D-E, sequentially represent lower mean household incomes.

The Hoehn & Yahr Staging Scale (HY), the Unified Parkinson's Disease Scale, Part 3 (UPDRS-III) and the 15-item Yesavage Geriatric Depression Scale (GDS-15) were used to assess the clinical profile of patients, and the equivalent daily L-dopa dose (DLDD) was calculated.

DLDD was calculated according to the following formula: dose of (immediate release levodopa x 1) + (controlled release levodopa x 0.75) + (pramipexole x 100) + (entacapone x 0.33) + (oral selegiline x 10) + (amantadine x 1)[21].

The HY scale was applied in the "off-medication" state to indicate the stage of PD of the subject (from 1 to 5). The higher the stage, the greater the severity of the disease.

UPDRS-III was used to assess the motor status of patients with PD. The score ranges from 0 to 108, with the higher the score, the worse the motor impairment. Tremor, Rigidity, Bradykinesia and Postural Instability Indices were obtained by adding their respective scores and dividing by the number of body regions evaluated in the UPDRS-III item[22,23]:

- Tremor with two items and seven body regions: item 20 (face, lips and chin, right hand, left hand, right foot, left foot) and item 21 (right hand, left hand);
- Rigidity with one item and five body regions: item 22 (neck, upper right limb, upper left limb, lower right limb, lower left limb);
- Bradykinesia with five items and nine body regions: items 23,24,25 and 26 (right sides, left sides) added to the item 31 score;
- Postural Instability with four items: 27, 28, 29 and 30.

The GDS-15 was used as a screening tool for depression with a total score of five or more points indicating suspected depression[24]. Subjects were invited to participate in the research in the waiting room of the outpatient clinic on the days of routine medical consultations. For data collection, the interview and evaluations were performed at the same time in a private room with patients in an on-medication stage.

The instruments were applied in the following order: 1. Sociodemographic Data Sheet; 2. SCOPA-COG; 3. UPDRS-III; 4. MMSE; 5. GDS-15. The exception was the evaluation of the stage of the disease, using the Hoehn & Yahr Scale. As this requires the patient to be in an off-medication state, in some cases it was necessary to schedule evaluation for the date of the next medical consultation. Data collection was performed by a researcher with previous experience in evaluation (cognitive, motor) of people with PD.

The Kolmogorov-Smirnov test was used to verify normality. Using a multiple linear regression, the independent predictor variables of the SCOPA-COG score were identified. The intergroup comparison (elderly vs. non-elderly) was performed using the Mann-Whitney test. To test association between age and cognitive status, the X^2 test, odds ratio and 95% Confidence Index were applied. The Statistica 13.2 software programme was used, with $p \leq 0.05$.

All the patients signed a Free and Informed Consent Form and the research was only carried out following approval from the Ethics Committee for Research Involving Human Beings of the Health Sciences Center of the Universidade Federal de Pernambuco under approval number 1814.749/2016, according to Resolution No. 466/2012 of the National Health Council.

RESULTS

Table 1 displays the general characteristics (gender, age, economic classification, schooling and work activity) of the total sample and the elderly and non-elderly groups. In the total sample there was a higher percentage of male subjects, aged 60-69 years, from socioeconomic stratum C, with two to five years of study and in labor activity group G2.

The multiple linear regression model found that the variables age, work activity and tremor index were significant, explaining 59% of variability in SCOP-COG (Table 2). Age and work activity exhibited an inverse correlation, while tremor displayed a direct correlation. The SCOPA-COG score decreased by 0.18 points for each one-year increase and five points for each change in group: from G1 (greater cognitive demand) to G2 or from G2 to G3 (lower cognitive demand). An increase of 10.2 points was observed for each increment of one point in the tremor index, which varies in a decimal form from 0 to 4.

When the groups of elderly and non-elderly patients were compared, there was a significant difference only in terms of DLDD, MMSE and overall SCOPA-COG score and the Executive functions domain of the scale (Table 3). According to the SCOPA-COG cut-off points for MCI and dementia, the presence of cognitive impairment was higher in the elderly (75%) than in the non-elderly (59%) group. The elderly also had a higher percentage of cognitive impairment based on the MMSE cutoff points for dementia (36%).

Table 1. General characteristics of sample (N=85), Recife, Pernambuco, 2017.

Variables	Total (85) n(%)	Elderly (53) n(%)	Non-Elderly (32) n (%)
Gender			
Male	47 (55)	28 (53)	19 (59)
Female	38 (45)	25 (47)	13 (41)
Age			
30 to 39 years	1 (1)	0 (0)	1 (3)
40 to 49 years	8 (9)	0 (0)	8 (25)
50 to 59 years	23 (27)	0 (0)	23 (72)
60 to 69 years	29 (34)	29 (55)	0 (0)
70 to 79 years	22 (26)	22 (41)	0 (0)
80 years and over	2 (2)	2 (4)	0 (0)
Economic Classification - ABEP			
B	26 (31)	16 (30)	10 (31)
W	37 (43)	24 (45)	13 (41)
D	22 (26)	13 (25)	9 (28)
Years of schooling			
2 to 5 years	33 (39)	26 (49)	7 (22)
6 to 9 years	13 (15)	4 (8)	9 (28)
10 to 12 years	19 (22)	8 (15)	11 (34)
13 and over	20 (24)	15 (28)	5 (16)
Work activity			
G1	22 (26)	16 (30)	6 (19)
G2	32 (38)	17 (32)	15 (47)
G3	31 (36)	20 (38)	11 (34)

Note: ABEP= Associação Brasileira de Empresas de Pesquisa (Brazilian Association of Research Companies)

G1: group with work activity of greater cognitive demand; G2: group with work activity of intermediate cognitive demand; G3: group with work activity of lower cognitive demand.

Table 2. Multiple linear regression with SCOPA-COG as a dependent variable. Recife, Pernambuco, 2017.

Independent variables	B	*p**
Age (years)	-0.181	<0.01*
Schooling (years)	0.185	0.32
Work Activity (G1;G2;G3)	-5.04	<0.01*
UPDRS-III	-0.83	0.07
Rigidity	4.11	0.11
Tremors	10.26	<0.01*
Bradykinesia	8.45	0.07
Postural instability	1.35	0.58
GDS-15	-0.10	0.64

Note: General regression results: R^2: 0. 59; F: 11.79; *p*:<0.0001*

B: Regression coefficient; G1: work activity of greater cognitive demand; G2: work activity of intermediate cognitive demand; G3: work activity of lower cognitive demand. UPDRS-III: Unified Parkinson's Disease Rating Scale, part 3; GDS-15: 15-item Yesavage Geriatric Depression Scale.

Table 3. Cognitive and clinical profile of sample. Recife, Pernambuco, 2017.

Variables	Total (n=85)	Elderly (n=53)	Non-Elderly (n=32)	*p**
Duration of disease: x̄ (±), years	7 (3)	7 (4)	7 (3)	0.92
DLDD: x̄ (±), mg/day	783 (612)	712 (608)	900 (609)	**0.02**
SCOPA-COG: x̄ (±)	20 (8)	19 (8)	22 (6)	**0.05**
Memory and learning	7 (4)	6 (4)	8 (3)	0.07
Attention	3 (1)	3 (2)	3 (1)	0.70
Executive Functions	7 (3)	6 (3)	8 (3)	**0.01**
Visuospatial Function	3 (2)	3 (2)	3 (1)	0.32
Patients without CI: %	31%	25%	41%	
Patients with CI: %	69%	75%	59%	
MMSE: x̄ (±)	24 (4)	24 (4)	26 (3)	**0.04**
Patients without CI: %	71%	64%	81%	
Patients with CI: %	29%	36%	19%	
UPDRS – III: x̄ (±)	30 (14)	28 (14)	26 (15)	0.60
Tremors	1 (0.8)	0.4 (0.4)	0.4 (0.4)	0.78
Rigidity	0.4 (0.4)	1 (1)	1 (1)	0.93
Bradykinesia	1.2 (0.8)	1.3 (0.8)	1.2 (0.8)	0.81
Postural instability	1.3 (0.7)	1.4 (0.7)	1.2 (0.8)	0.11
GDS-15: x̄ (±)	5 (3)	4 (3)	5 (3)	0.18

Note: *: *p* (Elderly vs Non Elderly). (Mann-Whitney Test). x̄ (±): Mean (standard deviation); %: Percentage; DLDD: equivalent daily L-dopa dose; SCOPA-COG: Scales for Outcomes in Parkinson's disease-Cognition; CI: cognitive impairment; MMSE: Mini-Mental State Exam; UPDRS-III: Unified Parkinson's Disease Rating Scale, part 3; GDS-15: 15-Item Yesavage Geriatric Scale.

According to the SCOPA-COG criteria, elderly individuals were three times more likely (OR=3.32–95% CI=1.06-10.79) to be categorized with cognitive impairment than non-elderly individuals (X2 = 5.39 with p= 0.02). In terms of MMSE, the chance of such a categorization was almost two and a half times greater (OR=2.42–95% CI=0.76-7.94) among the elderly (X2=2.81 with p=0.09).

DISCUSSION

Age, work activity and tremors were the only variables that significantly influenced the total SCOPA-COG score ($p \leq 0.05$). Age and PD seem to interact and negatively influence cognitive performance, specifically executive functions[8].

Regarding work activity, Bohnen et al.[25] and Silveira and Portuguez[26], corroborate the findings of the present study by indicating that involvement in mentally stimulating activities is associated with a better cognitive status among the elderly, including those with PD. The results of the present study indicated that there was an inverse correlation between work activity and SCOPA-COG score, or in other words the higher the category of the profession G(3), the lower the test score. This makes sense as G3 had the lowest cognitive demand, and the findings of Pool et al.[27] suggest that the higher the cognitive requirements of a profession, the better the individual's cognitive performance.

The complexity of the professional occupation performed throughout life directly influences cognitive reserve[28]. In theory, cognitive reserve allows individuals to cope better with the consequences of a disease which affects cognitive abilities, and remain clinically healthy for longer[29]. No studies were found that associate the cognitive demand of an occupation with the incidence/prevalence of the diagnosis of dementia in PD.

The tremors variable, measured by UPDRS-III, correlated directly with total SCOPA-COG score. This result can be explained by a possible protective factor associated with tremor symptoms. Baumann et al.[30], indicated that patients with signs of rigidity and bradykinesia had a higher risk of cognitive dysfunction than those with tremor symptoms, while Wang et al.[9] also found positive correlations between tremors and cognitive test scores.

Alesovski et al.[31], monitored the clinical progression of PD patients separated into a dominant tremor group (Group 1) and a postural disturbances and gait instability group (Group 2) over four years. After this period they found that Group 2 exhibited a more progressive deterioration in cognition than Group 1, which had a tendency to maintain a stable cognition.

The present study identified a significant difference between the elderly and non-elderly groups in DLDD, SCOPA-COG total score (and the Executive Functions domain) and total MMSE score. Adhikari et al.[10] reported that individuals aged over 60 with PD scored significantly lower on tasks that assessed memory and executive functions, while there was no difference between the groups in the MMSE. The reason for the absence of such a difference may be the small sample size, the fact that the majority of the sample was younger than 70 years, and the exclusion of patients with signs of dementia.

Dujardin et al.[32] categorized the sample into five groups according to cognitive phenotypes. Group 1 (G1) was composed of individuals with PD and intact cognition, while Group 4 (G4) included those with PD and severe cognitive deficits, particularly in executive functions. These two groups differed significantly in relation to age, with G1 having a mean age of 61 years and G4 a mean age of 73 years, showing how age affects performance in executive function tests.

While studies exist in literature that associate cognition in PD with age, to the best of our knowledge there are few comparisons between groups of elderly and non-elderly with PD and none at all for the Brazilian population. In the present study the elderly had a higher percentage of cognitive impairment than the non-elderly. In the study by Isella et al.[16], which used the SCOPA-COG, patients with PD and dementia were older and less educated than patients with PD who did not suffer cognitive impairment.

Levy et al.[33] evaluated four groups of 180 individuals with PD, separating them by age (<72

and ≥72) and greater or lesser severity of the disease. The older/more severe group had a higher risk of dementia (RR: 9.7) than the younger group with less severe conditions. When the factor of severity of disease was eliminated, the ≥72-year-old group was 1.6 times more likely to have dementia than those aged <72 years. These studies confirm the influence of aging as a risk factor for dementia in PD[11].

The elderly in the present study were 3.32 times more likely to be categorized with cognitive impairment than the non-elderly, according to SCOPA-COG. In a two-year follow-up study, a 70-year-old patient had a predicted risk of cognitive impairment of 13% within two years, while a 50-year-old had a predicted risk of 5% over the same period[34].

Cultural and educational differences should be considered when comparing data from Brazilian individuals with studies from Europe and the USA. Such comparison is necessary in the case of the present work, however, as to date it is the only study which compares the cognitive profile of Brazilian elderly and non-elderly individuals with PD.

Possible limitations of the present study include its sample size; the cross-sectional design, which does not allow the identification of causality; the non-inclusion of a control group of elderly and non-elderly individuals without PD and the application of tests in the on-medication stage only. Future studies with a larger sample size should also focus on the longitudinal monitoring of possible differences in the cognitive status of elderly and non-elderly individuals with PD.

CONCLUSION

The findings of the present study indicate that being elderly and having Parkinson's disease and a work activity with a lower cognitive demand are factors that negatively affect cognition, and can increase the chances of progression to dementia. The presence of tremors, meanwhile, was seen as a possible protective factor for cognition. These results, combined with longitudinal studies, may provide support for the formulation of treatments of prevention and cognitive rehabilitation, taking into account the influence of the factor of age on the cognitive performance of patients with Parkinson's disease.

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Care of the self in a social group for elderly women

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Abstract

Objective: to discover the meaning that a group of elderly women attributed to the dialogical sharing of experiences with their peers, and the way this was inserted in the process of living and aging, relating the findings with Care of the Self by Michel Foucault. *Method*: an exploratory, descriptive, qualitative study was carried out with 28 elderly women enrolled in the "Dialoguing Emotions" Workshop, a social group linked to a university in the countryside of the south of Brazil, through an interview and discussion based on the themes of their experiences. That which emerged from the interviews and discussions underwent content analysis. *Results*: the extraction of units of significance allowed the elaboration of two intertwining thematic categories: Experiences and strengths of aging in a group: the voice of the elderly and the care of the self: looking at myself and the other. *Conclusion*: an appreciation of the group relationships was identified, and this experience generated empowerment among participants when dealing with life challenges, providing new possibilities for overcoming subjective limiting experiences. The interaction with a space of listening and free expression, contributed to the rediscovery of oneself, enabled new ways to make oneself a subject in a late stage of personal existence, which in practical terms, has repercussions on emotional balance and greater awareness of the self, providing relief, motivation and determination to meet the challenges of longevity.

Keywords: Aging; Subjectivity; Groups of Coexistence; Care of the Self; Foucault.

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INTRODUCTION

Phenomena associated with increased longevity and the changing roles of women in the labor market, as well as the emergence of new family configurations, are impacting and changing the lifestyle of elderly women. The elderly are faced with a vast range of possibilities for becoming the subject, which sometimes conflicts with the limiting discourses that exist even day. If in other eras women had to adapt to social, cultural, sexual and moral norms, traditionally anchored in the patriarchal paradigm, there are now alternatives for a re-dimensioning of subjective, family, social and financial experiences. Faced with this transition, one of the spaces found for channeling, expressing and finding new ways of being and acting are social groups[1].

Social groups, created by governmental and non-governmental bodies, are understood to be spaces of communication and are recognized as a form of social and emotional support for the elderly. They are important strategies for improving the health and quality of life of this section of the population, by allowing the affirmation of identity and encouraging participation, which is expressed by the social protagonism of the elderly individuals. They can improve quality of life through the art of well-being and care of the self[2].

The Care of the Self, thematized in the works *Hermeneutics of the Subject* and *The History of Sexuality 3*, by the French philosopher Michel Foucault (1926-1984), developed around the theme of subjectivity, distancing itself from experience derived from historically instituted relations of knowledge and power, and the target of many of his previous studies. To achieve this, the author immerses himself in the Greek and Roman Hellenistic tradition, emphasizing the epicurean, stoic and cynical philosophies of the first two centuries of the Christian era, calling it the "golden era of the Care of the Self", undertaking a genealogy of the subject based on practices aimed at the self. Of this historical-philosophical context, says Foucault, "all the knowledge we need should be ordered by *tékhne toû bíou* (**the art of living**), a theme as much stoic as it is epicurean or cynical"[3]. As such, the role of this philosophy is to stimulate the individual to practice the art of living well[4].

For Foucault[5], the care of the self, from the Greek *epimeleia heautou*, means caring for the soul, the self. It consists in seeking a philosophy of life that exalts "the conditions and the undefined possibilities of the transformation of the subject", capable of discovering a new self and impelling it in search of itself, molding it, as it is intrinsic and coextensive to the life of person to know and take care of oneself[6].

In this sense, in order to understand the subjective experiences of the participation of elderly women in a social group, the researcher participated in meetings of this group and, together with the elderly women, sought to identify feelings and alternatives of life emerging from the established group relationships. Therefore, the objective of the present study was to identify the meaning that a group of elderly women attributed to shared dialogue of experiences and encounters with their peers. The results were discussed in the light of the problematizations of Foucault's care of the self.

METHOD

A qualitative study of exploratory and descriptive type was carried out with a social group linked to the extension program of a university in the interior of the south of Brazil. The study population consisted of 28 elderly women enrolled in the "Dialoguing Emotions" workshop. This represented the total number of elderly women enrolled in the workshop, with no exclusions or losses. Individual interviews were used for information collection. These were carried out in 2015 and followed the criterion of the gradual inclusion of participants, known as gradual theoretical sampling. Data collection was finalized when the theoretical saturation of the subject being investigated occurred. Therefore, the interviews included eight randomly selected elderly women and occurred at a date, place and time previously agreed with the participants. The instrument used was the topical guide that addressed the theme: conversations between the women and their meanings in the experience of living and aging. For the validation of the data collected in the interview, the rest of the group, consisting of 20 elderly women, was divided into two groups of ten, each of which participated in a thematic workshop of approximately 1h 30min. The workshops took advantage of play resources and self-expression.

The original meetings of the workshop offered by the Dialoguing Emotions group were weekly and lasted two hours, with times for exchanges and discussions about feelings, memories, experiences, health, the body, the mind, relationships with parents, partners and children, friendships, sexuality, work, crises of maturity and finally, with questions related to living and aging, with the aid of texts of various types, such as poetry and short stories, among others, as well as movies, music and images.

The information obtained in the interview and in the validation workshops were qualitatively analyzed using Bardin's thematic content analysis[7], in which the elements were classified by common characteristics and their subsequent categorization, comparing the data collected through the perspective of Foucault's Care of the Self. The study was approved by the Ethics Committee under approval No. 441.408, according to Resolution N. 466/12, by means of the signing of a Free and Informed Consent Form. Participants are identified as E (elderly), and the Arabic numerals corresponding to the order of the interview.

RESULTS AND DISCUSSION

That which emerged from the words of the elderly unfolded into categories that intertwine and complement each other. Two categories were therefore established: a) experiences and strengths of aging in a group: the voice of the elderly women and b) care of the self: looking at the self and the other.

The category **experiences and strengths of aging in a group: the voice of the elderly women** revealed that the group allowed the sharing of subjective experiences, with a common personal and family identity emerging from talking about oneself, which generated a sense of solidarity and an altruistic experience, and one of participation and social protagonism in relation to the feelings experienced. The following statements illustrate this perception:

> "I found out that I'm not the only one who has problems [...]. That all families are the same [...], they have single mothers, alcoholics, are separated, there's one who goes to school ..., one who earns a lot, one who doesn't work, that everyone goes through the same pain. When I shared this, I discovered that there were a lot of mothers who had gone through the same thing, who had suffered too, who had done well [...]. So for me it's an example that it's like this for everyone" (E3).

> "It's because we get there and see that everyone has problems, not just us" (E1).

The participants characterized the group as one of "solidarity", as a space of social insertion to express the existential problems of daily life and the feeling that the process of living and aging is accompanied by challenges such as the need to solidify and renew their personal life, their social and cultural projects, their conduct, temperament and behavior. These reciprocal exchanges contributed to the intertwining of ideas and thoughts, listening, respect and dignity, with new learning and the synthesizing new meanings for caring for the self.

> "One day they listen to me, the next day I'll listen" (E1).

> "The greatest meaning of this group, is that it has taught me to listen and respect the thinking of others, because [...] each person has their way of growing. So it's an extremely cohesive group, very good to get along with, I've grown a lot" (E7).

> "Look! I admire the variety of people, the feelings of people, the lives of people, that people are very different from ourselves. So, for me, this is very interesting. I think I have patience, I like to listen" (E5).

These reports indicate that women have structured a space of renewal in the field of aging. This scenario is conducive to the formation of a social, ethical identity capable of meeting the biopsychosocial and cultural needs of women going through old age.

Corroborating with the experiences, meanings and social interactions expressed by the elderly in relation to the sharing of experiences, Foucault's idea of care of the self[3] is not characterized as "a simple momentary preparation for life; it's a way of life." It has a therapeutic, curative and creative dimension, where the individual immerses themselves in their subjectivity, their soul, becoming the owner

of themselves, being able to generate autonomy, independence, empowerment, self-government[4,5,6]. It is a lifestyle that seeks, in a continuous and progressive manner, to exercise, experiment, and generate confidence. It is "to turn our gaze upon the things of the world to lead it to ourselves"[3]. Care of the self consists of a kind of "ethical conversion of the subject defined by the relation of the self to the self"[8].

For the Greek and Roman philosophers, including Socrates, Plato, Aristotle, Diogenes of Sinope, Epicurus, Seneca, Epictetus, Marcus Aurelius, it is never too late or too early to know and take care of oneself[3,5,6]. It is a continuous exercise, focused on self-knowledge, self-mastery, tranquility, how to meditate when getting up or lying down, creating daily activities and examining them as a practice of daily life. According to the following statement, the participant seeks to reflect on their existence on a daily basis and this care of themselves motivates them to face daily activities:

> "I am someone who loves to reflect. [...]. When morning comes, I thank God for the day, because I am waking up, that he gives me strength, perseverance, so that I can overcome all the obstacles that appear in the best way possible, and when I get to the night [as well]" (E7).

Specifically, "Foucault found that, in the imperative of 'occupying oneself', a possibility of elaborating oneself as an end in itself, that is, in the Hellenistic tradition, he found a self-finalization of care of the self"[9]. This self-constitution seeks to develop an active ethical subject, defined as the practice of the self. It is a technique that enables the subject, alone or with the coexistence of another, to carry out actions involving their body, soul, feelings, thoughts, attitudes, with the purpose of achieving happiness, purity of the emancipated and sovereign soul, tranquility when faced by existential finitude[10]. The discourse below signals this perspective, which is not an easy task:

> "In the beginning it took a while, because we [...] thought that we didn't need to talk about ourselves. [...]. In the workshop I managed to get it out because sometimes a person gets sick because they don't talk. [...]. When I see a sick friend, I say, "Hey! You need to go to [Workshop], talk, get it out " (E6).

> "It was a time when I was sick, nervous, sad. I had lost my brother [...]. [The Workshop] helped me. We can talk about our problems, our feelings. [...]. I was a very closed off person, extremely unhappy, I had no pleasure at all" (E2).

Listening to the other is an attitude of consideration and respect, a means of communication, of sedimentation of experiences[10]. According to the statements described, the workshop generated a social identity of subject, participatory character and citizenship, of social protagonism. The other, in Foucault's view[3,4,5,6] cannot be ignored in the constitution of self-care, because he or she characterizes the subject as belonging to humanity, that is, the bearer of existential meaning with which actions and reactions of a predominantly political and ethical nature are established. As Wanderbroocke et al.[2] states in a literature review study, feelings of the social identity of the elderly can be elicited by sharing in social groups, experienced as attitudes of motivation and participation, trust, justice, interaction, well-being, quality and satisfaction with life, reducing experiences of solitude and isolation.

In the category **The care of the self: looking at the self and the other** specific characteristics of the aging process emerged, namely appearance, social roles, group of friends and family life. These changes, which for a long time were seen only as losses, now provided subjective realizations, as the participants felt free of their traditional commitments, becoming protagonists of changes in the representation of old age, being able to reflect on their choices and their desires, as can be seen in the excerpts of the following discourse.

> "I sought out [the group] with the intention of finding resources to improve my emotional side, to live with the situations, especially the conflicts, which always followed me and I think they always follow people, some more so, some less so" (E4).

> "I really like the texts, because if I was to read at home on my own, I wouldn't go into them as much, like we do here" (E6).

> "I was so shocked with my age, I did not see that I had aged. I was kind of desperate at the time. Then I started to come to this group, to make myself aware that everyone has a problem. [...]. One way or another, then you have to deal with it. The bond I have with them [...] is an affection that we create, an affective bond! It is so affective, let's say broad, because you have confidence in the people, in the group!" (E2).

In these reports, it is inferred that participation in the workshop contributed to (re) finding oneself. The unreflective everyday experience kept the elderly women busy with the attributions of family and professional life, making care of the self something that was ignored or forgotten.

In the perspective of the care of the self proposed by Foucault[3,5], if a person's life is not examined, reflected upon and continually self-assessed, the subject runs the risk of being abruptly taken aback by some unexpected event and seeing their life disintegrate in the dimension of roles and senses. The lack of reflection and self-care leads to the loss of subjective conditions of emotional support for coping with life's setbacks.

In the freedom of speech (*parrehsía*), proposed and sustained by support groups, the subject emerges in its potential for self-construction and the assumption of desires, breaking with the contingencies that linked the individuals to historically constituted static roles that weaken in the perspective of life of the senile individual:

> You have confidence, you can talk, sometimes you say things that you always thought you would never talk about, because it is something that embarrasses you, there are things in life that you do not want to talk about [...], [because] they become public domain" (E4).

> "Sometimes at home we don't say anything, we don't talk because it hurts the ones at home, they get sick of us complaining every day. And here we have the freedom to talk, to express our problems, our feelings, that is why I am still coming today" (E6).

> "My dream is to have a boyfriend" (E7).

In these reports, the idea of returning to oneself occurred. It is inferred from this, that the space provided by the group for talking about particularities, gave the subject the strength to look at the world and the events of life with more bravery, with new expectations, new affective approaches. This way of caring for oneself, makes the subject, the elderly person, into a supply of subjective resources, of the soul, such as courage, moderation, tranquility, self-control (*enkrateia*) and their desires, shaping their conduct to tackle personal challenges and live better[11,4,5].

Through coexistence with others, with someone and something that is different, the elderly women have been able to see themselves, their attitudes, the social roles played out in the course of their lives, which were then shaped by social, cultural, religious, moral, orders, according to the traditional references of family and old age, for which women only perform the function of mother, grandmother, servant of the home, of the husband, often submissive, even in their sexual life. The care of the self encourages the subject to establish new relationships "with the woman, with others, with events and with civic and political activities"[6]. Now, the care of the self analyzed by Foucault proposes that the subject awakens from itself, with autonomy, responsibility, tranquility.

It is the art of living well, which means shaping one's own life, through immersion into subjectivity, into the values of the soul, establishing a style of freedom. "The subject of care of the self has as their first condition being shaped by one's own practices"[12]. It is to assume and recognize oneself as a subject, as a participant of a world of possibilities with oneself and with others, as a being in the world. The aesthetics of existence is a choice of existence. The statements below summarize this insertion in a group and the immersion in the self:

> "Participating in the group was the biggest investment I ever made [...]. It was very good. It was as if I had put together the pieces that were half disjointed and had formed a new being, or a whole being. So being here gave me another vision, I see it as a therapy" (E8).

> "I'm a little reserved, I like to listen more, so the experience of one, of the other, works for me too" (E6).

> "Here we can talk, get things out and people listen. Sometimes I do not think I'm going to reveal this in front of the group [...] but then we ended up creating this bond, that makes us talk, this trust that was created between us" (E4).

> "I've been coming to Dialoguing for more than three years. We learn because we have people who have also been through the same thing, they give you encouragement [...] sometimes we think it's just us who are going through it, but it's not" (E8).

> "I think it's important to have these groups, not just here for us, [...] but if everyone could participate it would be nice" (E3).

Caring for the self focuses on occupying the self. This restless position of seeking oneself has become a principle of rational, moral conduct in the world of Hellenistic and Roman thought and "a true cultural phenomenon as a whole"[3]. In this moral itinerary, the subject becomes master of themselves, not in the perspective of a "universal law, to which each and all should submit; but above all as a principle of stylization of conduct for those who want to give their existence the most beautiful and most accomplished form possible"[3].

The well-being, the self-care provided by the coexistence of the elderly women in a group, demonstrated that exploring the depths of the soul, sharing emotions, becomes a fuel, capable of driving new projects, giving meaning to existence. This way of caring for oneself acts in thought, feeling, the perception of oneself, in others and in the world, generating an action, a transformation in the manner of being of the subject, forming a "new being", as expressed in the words below.

> "I discovered that I am not the only one, that everyone is the same and goes through the same pains. We change our ideas and see that we have how we got through it [...], that we are the winners!" (E5).

> "I want to move on, I do not want to go back [...]. The family noticed this, a change" (E3).

> "As a human being, each has of us has our growth, [...] our understanding. [...]. I think that we have to realize what is good for us, not when its imposed on us, because when it's imposed, it's very difficult" (E7).

Corroborating this, one can evaluate that "the existence of collective spaces for the exchange of experiences, as well as the informal contacts of daily life, contribute to bringing the interlocutors closer"[1]. Therefore, caring for the self is an attitude, a way of being and acting in the world and with others[4,5,13,14]. This attitude toward the self makes the subject "consider themselves as an object of knowledge and field of action to transform themselves, to correct themselves, to purify themselves, to obtain their own salvation, etc"[8].

In order to reach this level of moral development, that is, this practice of the self, the care of the self can be related to *parrhesia*, which means speaking the truth, with frankness, being true to oneself, openness of thought, accepting oneself, the "courage of the truth ". [...]. *Parrhesia* involved a series of essential elements to consider the relations between philosophy, ethics, truth, politics and democracy in antiquity". Yet, *parrhesia* is a "way of saying, [...] an ethics of the word [...]. It is the opening of the heart, it is the need, among our peers, to hide nothing from each other and to think and speak frankly"[3].

> "We see that others sometimes have problems that are much more serious than what we are going through. But there came a time when none of this gave me what I needed. It was full of conflict. [...] They were two, three things inside - feelings, emotions that fought within me" (E4).

One of the ways of practicing *parrhesia* is to establish and maintain friendly relationships, especially in old age, because they help and provide emotional and motivational support, including feelings of belonging, trust and encouragement[13,14,15,16]. "Friendship was generally centralized around an individual with whom some were closer and [others] less close,"[3] as well as being the only condition in which one can bear the risks of the frank enunciation of the truth.

CONCLUSION

For the women in this study, sharing experiences in a social group, both through speech and listening, had a positive meaning. The reports of the participants demonstrated that in this space identifications and formations of significant bonds occurred, new demands and perspectives appeared in a late stage of life. Therefore, this space of sociability for the elderly contributes to emotional balance, allowing them to face the challenges of longevity and giving them greater capacity to be inserted in other required contexts of life.

According to the discourse of the participants, the expressions that emerged exalt the search for self-care, such as: learning, helping, welcoming, joy, alliance, friendship, love, collaboration, sharing, trust, communication, knowledge, comprehension, coexisting, complicity, dialogue, pain, understanding, bonding, family, happiness, history, imagination, different ideas, memories, dividing things, remembrances, respect, revival, solidarity and equality. Now, the philosophy of care of the self requires vigilance, energy, learning to live and to dialogue. All these expressions demonstrated a fruitful dialogue with the self and the other.

The opportunity to share joys and sorrows, to talk about themselves, their identity and their subjectivity, allowed the participants to develop new possibilities for learning, immersing themselves in a reciprocal pedagogical relationship of teaching and learning, capable of generating changes in style and in the projects of individual life, a kind of gerontological education based on one's own experience. This " laboratory of awareness" of care of the self that the group has provided for the elderly, has allowed the integral empowerment and overall development of these women, demonstrating that human biopsychosocial development can be a permanent process, extended to all stages of the human existence.

If caring for the self is a lifelong project, the reports of the participants showed that the space for listening, socializing and expressing feelings, achievements, joys, anguish and sadness contributed to the formation of meaningful bonds, of welcoming, dialogue, of finding oneself, of emotional equilibrium, solidarity, providing relief, comfort, motivation and determination to face the challenges of longevity.

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The iatrogenic triad in a group of elderly women contracted to a health plan

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Abstract

Objective: to study the main elements of the iatrogenic triad in a group of elderly women with a Chronic Non-Communicable Disease (CNCD) contracted to a health plan. *Method:* A cross-sectional and descriptive epidemiological study was carried out by analyzing 3,501 medical prescriptions of 725 elderly women aged ≥65 years. The medications were determined to be Potentially Inappropriate Medications (PIM) based on four instruments (AGS Beers 2015, PRISCUS List, EU(7)-PIM, Brazilian Consensus of PIM – CBPIM). In addition, the most prescribed drugs were assessed for possible Drug Interactions (DI) and classified according to degree of severity. *Results:* the present study revealed that 89.3% of the studied group used at least one element of the iatrogenic triad, and 44.9% of the sample were associated with the use of polypharmacy and PIM. A total of 48.0% were taking at least five continuous use medications. The main DI were omeprazole, simvastatin and levothyroxine, all of which are of significant severity and have potential drug-food interactions. A total of 35.1% of PIM were identified through the four criteria used, 26.6% were identified by the CBPIM, 25.8% by the EU(7)-PIM, and 24.6% and 6.6% by AGS Beers and PRISCUS, respectively. *Conclusion:* a high index of continuous use medications, PIM and potential DI were identified, mainly enzymatic inhibitors in a group of elderly women at risk due to their clinical characteristics. Old age was associated with the presence of all the elements of the iatrogenic triad. It was also noted that there were no significant differences between the criteria applied, except for the PRISCUS list.

Keywords: Old Age Assistance. Prescription Drug Overuse. Potentially Inappropriate Medication List. Drug Interactions. Prepaid Health Plans. Public Health.

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INTRODUCTION

The elderly are the most frequent consumers of medications yet at the same time are the most sensitive and exposed to Adverse Drug Related Events (ADRE) such as: prescription or drug cascades; toxic effects; the Iatrogenic triad, defined as the prescription of at least one potentially inappropriate medication (PIM), combined with the continued use of polypharmacy and the presence of potential drug interactions, and adverse drug reactions (ADR). It is estimated that 30% of the healthcare appointments of this age group are related to problems with medications[1,2].

A variety of drugs sold to and consumed by the elderly are associated with the emergence of several types of drug interactions (DI), namely: drug-drug, drug-disease, drug-laboratory test, drug-food and drug-tobacco interactions. Thus, a pharmacological or clinical response where the effects of a drug are altered by the combination of two or more drugs, herbal remedies, food, alcoholic beverages or environmental chemical agents defines the presence of DI[3].

ADR are considered to be a harmful and non-intentional response to the use of a drug whose dosage is normally used for prophylaxis or the diagnosis or treatment of diseases. Diuretics, antilipidemics, beta-blockers, anti-inflammatories, digitalis, inhibitors (omeprazole, cimetidine and captopril) and enzyme inducers (phenytoin and carbamazepine) are some of the medicines that frequently cause ADR and are responsible for approximately 25% of resulting hospital admissions, which are mostly caused by an acute reaction[4,5].

Polypharmacy, which is considered the continuous and simultaneous use of at least five different types of drugs, potentiates the therapeutic risk of potential DI, the prescription of PIM and the causing of ADR. PIM are medications prescribed by physicians which present a risk of causing adverse effects which exceed their benefits, and where there effective alternatives to their use exist. The increased risk of adverse reactions, the use of medications that aggravate the underlying disease or the lack of scientific evidence about the therapeutic efficacy of the medication can also be considered PIM[1,4,5,6].

Faced with this problem, groups of specialists have proposed instruments (criteria) that allow the detection of drugs that are potentially iatrogenic for the geriatric population, considering the degree of evidence for the use of each drug. Each instrument corresponds to the standards of commercialization and the prescription profiles of each country, and include criteria from France, Germany, Australia, Norway, Canada, the United States, England, South Korea and, more recently, Brazil[7]. The best known instruments are the Beers Criteria[8], the Screening Tool of Older Person's Prescriptions – STOPP/ Screening Tool to Alert Doctors to Right Treatment – START[9], Fit for the Aged – FORTA[10] and the PRISCUS List[11].

Although some European countries provide their own criteria, in 2015 the European Union developed the European List of Potentially Inappropriate Medications - EU(7)-PIM. This is an up-to-date instrument with a high level of revision, and contains 282 substances contraindicated for use in the elderly. Unlike other instruments, this list provides therapeutic alternatives to clinicians, which facilitates the replacement of PIM[12].

The Beers Criteria were developed and published by the North American geriatrician Dr. Mark Howard Beers in 1991 to classify the main PIM in use by elderly people living in a long-term care facility. In 1997, the instrument was reviewed and expanded and in 2003 it was adapted for use in several other geriatric services. As of 2012, the American Geriatric Society (AGS) began to participate in periodic reviews, adding quality assessments to the scientific evidence, strengthening these recommendations and helping to disseminate the criteria. The latest review, published in 2015, included a list of potential associated interactions, drugs to be avoided, and those that should have their dosages adjusted based on their renal function in elderly individuals[8].

Based on the content of the Beers Criteria 2012 and the Screening Tool of Older Persons' Prescriptions (STOPP) 2006, the first Brazilian Consensus on Potentially Inappropriate Medications (CBMPI) was validated and published for use in the elderly. This instrument was created with the aim of improving the quality and safety of the prescriptions of elderly people susceptible to ADRE[13].

Studies have shown that the criteria for the verification of drugs which are inappropriate for use with the elderly, as well as the systematic investigation of drug interactions, are still little used in Brazil, especially by the medical profession. In addition to the need to educate and raise the awareness of health professionals working in elderly health care, the use of lists of criteria and programs for detecting DIs, most of which are free and easy to access, along with close collaboration between medical professionals has been found to be effective in reducing potential harm to elderly patients[14,15].

Despite these efforts, there is still a lack of research exploring the pharmacological issues of the elderly in the Brazilian supplementary health sector. This is a probable risk group for ADRE, as they have quick and easy access to a wide range of health services. The present study aimed to investigate the presence of elements of the Iatrogenic Triad (PIM prescription, continuous use of polypharmacy and the presence of the main potential interactions associated with medication) in a group of elderly women participating in a disease management program, who were contracted to a health plan in the city of São Paulo, Brazil.

METHOD

Between September and December 2015, a cross-sectional, descriptive, retrospective study was conducted on the use of drugs by a group of non-institutionalized elderly women, contracted to a supplementary health plan in the city of São Paulo, and who were part of a chronic disease management program (CDM) provided by a health plan provider (HPP) in that city.

All the prescriptions provided to this group of women during the study period were analyzed. The women surveyed were all the elderly women participating in the program, the inclusion criterion of which was age ≥65 years, the age range stipulated by the health plan provider.

Characterization of CDM program

In 2005, the national health agency (NHA), which is responsible for defending the public interest in the supplementary health care sector, ordered that HPP offer health promotion and disease prevention programs in response to a change to the pattern of illness of the population. Since then, resolutions have been issued that aim to encourage the implementation and maintenance of such programs by these companies[16].

These programs should be implemented for a population with a risk profile by instituting actions and multiprofessional coordination, ensuring follow-up, evaluation and continuous monitoring of participants via health indicators. Some operators, mostly multi-nationals, have executed such programs through the methodology of disease management (DM) or CDM[16].

The CDM program is designed with the goal of promoting health and preventing chronic diseases. To this end, it seeks to increase the involvement of the elderly with their illness(s), stimulating self-care, preventing acute crises and complications of chronic non-communicable diseases (CNCD), hoping to beneficially affect the natural course of the disease. This program involves monthly telephone monitoring and home visits, the frequency of which depends on the complexity of the case of each elderly person receiving care. Both actions are performed by trained nurses. Adherence to the program is voluntary and, if there is interest in participating, there is no time limit for participation[16].

All participants in this program must have at least one diagnosed CNCD, in addition to being ≥65 years of age and be receiving medical follow-up care and treatment for their illness. It should be noted that the physicians who accompany these elderly people have no relationship or interaction with the program, and the elderly choose them freely through the service provided by the health plan itself.

Exclusion criteria

Only elderly women using single medication were excluded from the study as they did not present a risk of drug interaction. In addition, the medical prescriptions of products such as moisturizing creams, eye drops, sunscreens, vitamins, herbal products and medicines in formulas were excluded.

Study variables

The study variables were age; number and type of drugs prescribed for the elderly; potential DI and severity, and the presence of PIM according to the following instruments: AGS Beers Criteria 2015[8], PRISCUS list[11], the European Union PIM list - EU(7)-PIM[12] and the Brazilian Consensus of PIM - CBMPI[13]. In this way, it was possible to analyze the prevalence and concomitance of the elements that make up the Iatrogenic Triad, as well as their distribution according to age group (65-69, 70-79 and ≥80 years).

Methodological development

During the activities of the previously mentioned program, information was collected on the medical prescriptions provided to this group and included in an electronic database. The inclusion of all medical prescriptions provided, by more than one specialist and used by the group were analyzed because of the high frequency of fragmented healthcare provided to the elderly. In addition, some medical prescriptions had been active since 1971, and had been updated regularly in terms of the posology and date of prescription until the year of collection. The descriptive analysis comprised categorical and continuous measures, the latter expressed in the form of measures of central tendency and dispersion measures. The categorical data were expressed by absolute (n) and relative (%) frequency distribution.

All drugs were analyzed according to the Anatomical Therapeutic Chemical Classification (ATC)[17].

The ATC classification is recognized and recommended by the World Health Organization (WHO) as an international standard for drug use studies. This classification system divides medications into different levels according to the organ or system in which they act (1st level) and their therapeutic (2nd level), pharmacological (3rd level) and chemical (4th and 5th level) properties[17].

All the medications analyzed were classified according to the ATC and divided according to the anatomical group or main system in which they act (1st level). To identify the substances from their trade names, a pharmaceutical specialty dictionary (PSD) was used. Medications without a specific ATC code were classified as far as possible by identifying the group, class or therapeutic action.

The prescriptions were classified as polypharmacy or otherwise through the number of drugs prescribed, based on a minimum of five or more drugs in continuous use by the elderly. It should be noted that despite the presence of several definitions of polypharmacy, both qualitative and quantitative, and the lack of consensus, the present study opted for the definition of prevalence applied in literature and commonly used in clinical practice[1,2,4,5].

Potential drug interactions were identified through three software programs available online, initially by Medscape® (Drug Interaction Checker), followed by confirmation via Micromedex® (University of Maryland Medical Center Drug Checker) and Drugs.com® (Drug Information Online). All interactions were validated according to their potential severity and confirmed by the programs to increase the accuracy of the information. The researchers opted to use the Medscape® software to analyze the impact of the interactions associated with medication as it is a widely used and accepted program and is considered the gold standard in this segment. In cases of disagreement between the databases regarding the classification of interaction, the lower classification of severity was adopted. Based on the information available in the databases consulted, only the most prevalent drugs were described and classified for severity, and the DI could be considered non-significant, significant and highly significant.

To determine PIM regardless of diagnosis and clinical condition, the Beers Criteria 2015, PRISCUS list, EU(7)-PIM and CBMPI were used. The selection of these criteria was based on the prevalence of use in literature and the fact that they covered different regions of the world. In terms of screening, PIM was considered present when identified by any of the criteria mentioned above.

Ethical assumptions

The study was explained to all the participants in the study, who were also informed about the

voluntary, optional nature of their involvement and the confidentiality of their data. After signing a Free and Informed Consent Form (FICF), a team of nurses collected the data in the patients' homes during the CDM program activities. The research project was approved by the Research Ethics Committee of the Centro Universitário São Camilo, SP, CAAE: 48122015.7.0000.0062.

RESULTS

Prescriptions were given to 725 elderly women contracted to a health plan in the city of São Paulo, whose mean age was 77.9 (± 7.37) years, ranging from 65 to 101. Longevity was observed in the studied group, as 41.1% were 70-79 years old and 40.4% were aged ≥80 years.

A total of 3,501 drugs were prescribed by physicians, with an average of 5.8 (± 2.49), ranging from two to 13 drugs/elderly woman, with a median of 6 and an interquartile between 4 and 7. The prevalence of elderly women taking ≥5 drugs on a concomitant and continuous use basis was 48.8% (348). When analyzing mean drug consumption versus age range, a maximum mean of polypharmacy of 6.1 (± 2.51) was observed in elderly women aged ≥80 years, as shown in Table 1.

The three most prevalent DI with significant severity were simvastatin versus omeprazole (151; 20.8%), simvastatin versus levothyroxine (120; 16.5%) and omeprazole versus levothyroxine (108; 14.8%). All three drugs mentioned presented a potential drug-food interaction risk, with omeprazole and levothyroxine having significant severity and simvastatin highly significant severity. The distribution of the most prevalent DI according to age, severity level and potential ADR are shown in Table 2.

Table 1. Analysis of medical prescriptions according to the number of medications, age and presence of continuous use medication, of a group of elderly women contracted to a health plan in the city of São Paulo, Brazil, 2015.

	n (%)	Age	Continuous use medications
65-69 years	134 (18.5%)	67.1 (±1.5)	5.0 (±1.9) (02-10)
70-79 years	298 (41.1%)	74.8 (±2.6)	5.8 (±2.6) (02-13)
≥80 years	293 (40.4%)	84.9 (±4.0)	6.1 (±2.5) (02-13)
Overall	725 (100%)	77.9 (±97.3)	5.8 (±2.4) (02-13)

Table 2. Main drug-drug interactions found in prescriptions given to a group of elderly women contracted to a health plan in the city of São Paulo, Brazil, 2015.

Variable	Drug-drug interactions		
	Simvastatin *versus* Omeprazole	Simvastatin *versus* Levothyroxine	Omeprazole *versus* Levothyroxine
Severity	Significant	Significant	Significant
Potential risk	Serum increase of simvastatin leading to myopathy (rhabdomyolysis) and liver disease	Decreased therapeutic efficacy of levothyroxine leading to adverse effects (fatigue, drowsiness, constipation, weight gain, feelings of depression, low temperature intolerance, cutaneous and capillary xerosis)	
Age			
65-69 years	27 (3.7%)	20 (2.7%)	12 (1.6%)
70-79 years	65 (8.9%)	50 (6.8%)	38 (5.2%)
≥80 years	59 (8.1%)	50 (6.8%)	58 (8%)
Total	151 (20.8%)	120 (16.5%)	108 (14.8%)

All the drugs were analyzed and determined as appropriate or potentially inappropriate. For this, four screening instruments were used, as mentioned, and all were grouped as PIM. It was found that 81.1% (588) of the studied women use at least one PIM, with an average of 2.8 (± 1.43) PIM/elderly woman and a median of 3 [IQ 2- 4] PIM/elderly woman.

All 1,232 (35.1%) PIM identified by the four criteria were grouped, analyzed and classified according to the ATC classification. A high prevalence of prescriptions for the digestive system and metabolism (494; 40.0%) was observed, followed by for the central nervous system (351; 28.4%), cardiovascular system (128; 10.3%), skeletal muscle system (107, 8.6%) and blood and hematopoietic organs (55, 4.4%). The groups with the lowest prevalence were systemic use hormones and antiparasitic products (<0.1%). Table 3 presents the main PIM as defined by the ATC classification, according to the age group of the studied group.

A high prevalence of prescriptions of PIM, defined in accordance with the CBMPI (932; 26.6%), the EU(7)-PIM (904; 25.8%) and the Beers Criteria (864, 24.6%) was also observed. The PRISCUS list identified only 6.6% (233) of PIM (Table 4). The mean number of PIM per elderly person was 2.2 ±1.21 (1-7) according to the CBMPI, 2 (±1.02) (1-5) according to the EU(7)-PIM, 1.9 (±1.01) (1-5) according to the Beers Criteria and 1.3 (±0.54) (1-3) according to the PRISCUS list. The main PIMs prescribed to the group were omeprazole, insulin, furosemide, clonazepam, promethazine and aspirin.

Table 3. Anatomical Therapeutic Chemical Code (ATC) classification of the main potentially inappropriate medications according to age, prescribed to a group of elderly women linked to a health plan of the city of São Paulo, Brazil, 2015.

Code	Systems	n (%)	n (%)	n (%)
		65-69 years	70-79 years	≥80 years
A	Digestive system and metabolism	85 (6.8)	213 (17.2)	196 (15.9)
B	Blood and Hematopoietic Organs	08 (0.6)	22 (1.7)	25 (2.0)
C	Cardiovascular system	11 (0.8)	50 (4.0)	67 (5.4)
D	Dermatological	03 (0.2)	07 (0.5)	10 (0.8)
G	Genito-urinary system and sex hormones	08 (0.6)	14 (1.1)	07 (0.5)
H	Systemic use hormones, excluding sex hormones	-	-	01 (0.08)
J	General anti-infectives for systemic use	06 (0.4)	10 (0.8)	11 (0.8)
M	Muscle skeletal system	23 (1.8)	47 (3.8)	37 (3.0)
N	Central nervous system	46 (3.7)	135 (10.9)	170 (13.7)
P	Antiparasitic Products	-	01 (0.08)	-
R	Respiratory system	06 (0.4)	03 (0.2)	07 (0.5)
S	Sense organs	01 (0.08)	-	02 (0.16)
	Total	197 (15.9)	502 (40.7)	533 (43.2)

Table 4. Main PIMs identified by the Beers 2015, PRISCUS, CBMPI and EU(7)-PIM criteria, among a group of elderly women contracted to a health plan in the city of São Paulo, Brazil, 2015.

n	233 (6.6%) PIM, according to the PRISCUS list 189 elderly persons (26%) used at least one PIM identified by these criteria
41	Bromazepam
20	Alprazolam
18	Fluoxetine
17	Zolpidem
15	Nitrofurantoin
12	Meloxicam
09	Sotalol
09	Oxybutynin/Dimenhydrinate
07	Ticlopidine
06	Methyldopa/Pentoxifylline
	864 (24.6%) PIM, according to Beers 2015 criteria 480 elderly women (66.2%) used at least one PIM identified by this criteria
336	Omeprazole
71	Insulin
50	Clonazepam
44	Promethazine
42	Aspirin
27	Orphenadrine/Quetiapine
22	Diclofenac
20	Alprazolam
19	Carisoprodol
17	Zolpidem
	904 (25.8%) PIM, according to EU(7)-PIM 516 elderly women (71.1%) used at least one PIM identified by this criteria
336	Omeprazole
71	Insulin
50	Clonazepam
44	Promethazine
41	Bromazepam
23	Glimepiride/Sitagliptin
22	Diclofenac
20	Alprazolam
18	Fluoxetine
17	Zolpidem
	932 (266%) PIMs, according to CBMPI 525 elderly persons (72.4%) used at least one PIM identified by this criteria
336	Omeprazole
58	Furosemide
50	Clonazepam
44	Promethazine
42	Aspirin
27	Quetiapine
22	Diclofenac
20	Alprazolam
19	Carisoprodol
17	Prednisone/Zolpidem

PIM: Potentially inappropriate medications;

EU(7)-PIM: EU list of potentially inappropriate medications;

CBMPI: Brazilian consensus of potentially inappropriate medications.

The analysis of the elements of the Iatrogenic Triad revealed that 89.3% (648) of the elderly women met at least one element of the same, and 44.9% (326) were associated with the continuous and simultaneous use of polypharmacy and PIM. Of these, 46.0% (150) corresponded to elderly women aged ≥80 years, 38.3% (125) to elderly women aged 70-79 years, while the lowest number, 15.6% (51), were aged from 65 to 69 years.

DISCUSSION

In recent years, a Brazilian demographic phenomenon has attracted the attention of researchers: the high prevalence of the female gender in the geriatric population. The latest data, published in 2018, from the Brazilian Institute of Geography and Statistics (IBGE), show that women make up the majority of this age group, with 16.9 million (56% of the sector), compared to 13.3 million elderly men (44%). Elderly women ≥80 years old are twice as numerous as men of the same age, while there are four to five times more women than men aged 100 or over[18]. In terms of the demographic characteristics of elderly persons receiving care from the Brazilian supplementary health sector, the greatest coverage is among female elderly persons, in the age group between 70 and 79 years, mainly in the southeast of Brazil, data concordant with the findings of this sample[19].

The female gender remains a constant risk factor for numerous conditions in advanced age, such as the continuous and concomitant use of ≥5 medications (polypharmacy), the use of psychotropic drugs and PIM[20,21]. According to national studies conducted with elderly people from this segment, the general average daily consumption of medication per elderly person ranges from 3.5 to 5.9. When consumption among elderly women was investigated, a higher average than the overall group, which was similar to the data found in the present study, was identified[22,23].

As described, the group of elderly women participating in the present study are part of a program for which, as an inclusion criterion, the diagnosis of at least one CNCD is required. This determines the greater clinical and therapeutic vulnerability of the group, highlighting the importance of avoiding the irrational use of medications, especially those considered potentially inappropriate. Thus, the risk of the occurrence of ADR, illness, decompensation of the underlying disease(s), profiles of confusion (delirium), dependence, hospitalization and institutionalization increases significantly[5,23].

The main interactions found in the studied population were between omeprazole, simvastatin and levothyroxine, and all were classified as of moderate or significant severity. The DI found are related to enzyme inducer or inhibitor medications, mechanisms which favor the development of DI and the combinations of which should be avoided as they involve pharmacokinetic processes of the hepatic inhibition of other drugs[24,25].

The combination of omeprazole and simvastatin was present in 20.8% of prescriptions, resulting in an interaction of significant severity. These medicinal products are administered concomitantly in hospitalized and outpatient clinical practice, especially for long-term outcomes in patients at risk of cardiovascular events. The sole prescription of HMG-coa reductase inhibitors involves a risk of myopathy, especially rhabdomyolysis, a pathological condition which may be increased when combined with antimicrobials (azithromycin, ciprofloxacin, clarithromycin and fluconazole). When combined, these drugs may lead to the competitive inhibition of intestinal β-glycoprotein and biotransformation by CYP4503A4 and/or cytochrome P450, resulting in increased plasma concentrations of simvastatin, augmenting the risk of side effects such as liver damage, muscle tissue degradation leading to rhabdomyolysis and acute renal injury. During the evaluation of these patients, the clinical non-specificity of the condition may lead to underdiagnosis and thus, a delay to the correct management of the condition[24-26].

The combination of simvastatin and omeprazole with levothyroxine leads to a reduction in the therapeutic efficacy of levothyroxine. Levothyroxine is the synthetic form of the thyroid hormone thyroxine (T4) and is used for hormone replacement in cases of hypothyroidism, regardless of the etiology. This synthetic hormone should be administered in

the morning after fasting, one hour before breakfast, due to the potential risk of drug-food interaction. The reduced therapeutic efficacy of levothyroxine may lead to adverse effects such as tiredness, drowsiness, constipation, weight gain, feelings of depression, low temperature intolerance, cutaneous and capillary xerosis. In the long term, serum levels of cholesterol, homocysteine, and C-reactive protein increase. There is also a risk of bone fractures and increased arterial stiffness, which becomes a significant risk factor for cardiovascular diseases[27].

It should be noted that the administration of simvastatin, levothyroxine and omeprazole near meal times should be contraindicated. These also a significant risk of drug-food interaction, as the reduction in the rate of drug absorption slows gastric emptying, causing interactions that lead to harm. Therefore, respecting the gaps between the administering of these drugs and meals is important for the bioavailability of the impact of the medication[28].

Proton pump inhibitors (PPI), such as omeprazole, are commonly prescribed drugs for the treatment of gastroesophageal reflux disease, esophagitis, gastritis, peptic ulcers, gastrointestinal bleeding, and gastric protection. However, use for more than eight weeks is contraindicated and inappropriate, due to the potential for the development of loss of bone mass leading to osteoporosis and fractures, dementia, renal injury, pneumonia, altered gastric pH favoring Clostridium difficile infections, hydroelectrolytic disorders (hypomagnesaemia, hypokalemia) and even vitamin B12 and iron deficiency due to gastric atrophy and malabsorption. The prolonged use in the elderly with *Helicobacter pylori* infection or with successful eradication is associated with an increased risk of developing gastric neoplasia. In addition, the use of PPI concomitantly with other drugs represents a high risk for DI, and these drugs should be prescribed with caution[8,12,13,29,30].

It is important to note the high prevalence of PIM in the studied group, similar to that described in literature for elderly people in this health sector, with a prevalence ranging from 11.7 to 41.9%[20,21,27]. However, when assessing hospitalized or institutionalized elderly persons or only those in outpatient follow-up care, there is great variability in the prevalence of PIM (2.9% to 91.9%),[30,31].

Despite the large number of criteria for PIM screening available, not many are applicable in different regions of the world, and few studies have compared these criteria to determine their differences, applicability or ability to identify PIM. The present study applied four criteria from different regions of the world (the USA, the European Union, Germany and Brazil) and found similarities in prevalence among CBMPI, EU(7)-PIM and AGS Beers 2015. The PRICUS list identified a low prevalence of PIMs in the sample studied. In a study by Novaes et al.[28], a high prevalence of PIM (50% for AGS Beers 2015 and 59.5% for EU(7)-PIM) was found among Brazilian elderly persons residing in the community. This same study found a high degree of agreement between the criteria and noted that the EU(7)-PIM criterion had greater sensitivity and the Beers had a more balanced profile between specificity and sensitivity. However, further studies in Brazil should be carried out.

The use of more than one instrument for screening in the present study allowed more accurate PIM screening, as each of the instruments has flaws for the reality of Brazil. It is worth mentioning the importance of periodic reviews, the insertion of other medications that are widely used by the Brazilian geriatric population and an annex with therapeutic alternatives. In addition, the participation/partnership of the Brazilian Society of Geriatrics and Gerontology (SBGG) in the reviewing and divulgation of this instrument for professionals in the area is of the utmost importance.

When the presence of at least one element of the Iatrogenic Triad was analyzed, it was observed that 89.3% of these elderly women used PIM, polypharmacy or potentially interacting drugs, and it was noted that 44.9% used at least two elements of the triad on a daily basis.

These data, associated with the high prevalence of PIM (35.1%) in this group and the excessive use of prescribed medications (48.8%), are a concern

for the researchers. The findings, added to the advanced age identified and the presence of chronic conditions, make the studied group highly susceptible to unfavorable outcomes of ADRE.

Limitations

It should be noted that the present study has some limitations. The sociodemographic and clinical particularities of risk in the studied group make it impossible to generalize and compare the results obtained. Furthermore, elderly women who used two or more drugs were included in the study as they presented a risk of drug interaction, leading to an overestimation of the results obtained by measures of central tendency in terms of the number of drugs prescribed. Due to the lack of analysis of the type and number of diagnoses of the elderly, it was not possible to state whether the findings were harmful to this group. It is also worth noting that functional deterioration, self-medication, interaction with underlying disease(s), the occurrence of ADR and the outcome of the ADRE (institutionalization, hospitalization or death) were not evaluated in the present study.

CONCLUSION

The present study identified a high level of Potentially Inappropriate Medications and the taking of continuous use drugs – mainly enzymatic inhibitors – as well as a significant risk for the development of drug interactions in a group of elderly women with chronic non-communicable diseases contracted to a health plan in the city of São Paulo, Brazil. The advanced age of the group and the high prevalence of elements of the Iatrogenic Triad were concerning. The association between the demographic and clinical characteristics of the investigated group also predisposes the further association of these findings with functional deterioration, prescription cascades, hospitalization and morbidity and mortality.

There was no difference in the prevalence of potentially inappropriate drugs identified by the criteria used in this study, except for the PRISCUS list. Although the Brazilian Consensus on Potentially Inappropriate Medications, the European List of Potentially Inappropriate Medications and the Beers 2015 Criteria have been found to be effective, the application of more than one instrument seems to have allowed greater screening accuracy.

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Analysis of risk factors for falls among institutionalized elderly persons

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Abstract

Objectives: to identify the demographic and clinical profile, context of risk and the occurrence of falls among institutionalized elderly persons; analyze the association between the classification of risk of falling using the Brazilian version of the Morse Fall Scale and the occurrence of falls in such individuals. *Method*: A cohort study was performed in two long-stay institutions in the city of Porto Alegre, Brazil. The sample consisted of 193 elderly persons. Descriptive and inferential statistics (Chi-squared and Fisher tests) were used for analysis. *Results*: The occurrence of falls was associated with hearing impairment, hand grip strength, Katz Index score, degree of dependence according to Collegial Board Resolution 283/2005 and risk of falls according to the MFS-B. *Conclusion*: Falls have multifactorial causes, which makes it important to identify the agents that contribute to their occurrence, as it is known that institutionalization significantly increases the risk of falling. Multidisciplinary actions are important for reducing the risk of falls, together with the use of instruments that can predict such risk among institutionalized elderly people.

Keywords: Patient Safety; Accidental Falls; Risk Factors; Elderly; Homes for the Aged.

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INTRODUCTION

The Brazilian Ministry of Health[1], through Ordinance nº 529 dated April 1, 2013, established the National Program for Patient Safety (PNSP) for the monitoring and prevention of harm in healthcare. Among the objectives of the program are to create a culture of patient safety, implement safety practices and reduce events that cause harm to the patient. Nine thematic areas were established for the construction of protocols, guides and manuals for patient safety. One these areas is the prevention of falls.

According to the World Health Organization[2], falls are defined as the event in which a person "comes to rest inadvertently on the ground or floor or other lower level, excluding an intentional change of position to rest on furniture, walls or other objects".

Generally, falls in patients are associated with factors related to both the individual and the environment. Factors related to the individual include advanced age; a recent history of falls; a reduction in mobility; urinary incontinence; use of medications and postural hypotension, while notable among environmental and organizational factors are uneven floors, objects dropped on the floor, inadequate chair height, insufficient or inadequate human resources[3,4].

Falls are the second leading cause of accidental or unintentional injury deaths worldwide. Each year, about 646,000 people die from falls around the world, 80% of whom live in underdeveloped or developing countries. Adults over 65 suffer a greater number of fatal falls. Each year, 37.3 million falls are severe enough to require medical attention[5].

Several studies conducted over the years were analyzed by the Brazilian Society of Geriatrics, which classified the risk factors for falls into three categories: intrinsic factors, extrinsic factors and behavioral factors[6].

Of adults hospitalized in Brazil for falls from November 2013 to November 2014, 25% were elderly, while 63% of elderly patients who had fallen died as a result of their fall. According to data contained in the Protocol for the Prevention of Falls of the Brazilian Ministry of Health, "among patients who suffered falls there are reports of a greater occurrence in patients in transfer to long-term care environments"[3].

In Brazil, there is no single meaning for a long-term care facility for the elderly (LTCF). Throughout its history, the origin appears linked to asylums or shelters, led by Sisters of Charity organizations[8]. Collegial Board Resolution (RDC) Nº 283/20059 defines a LTCF as a "governmental or non-governmental institution of a residential nature, intended for the collective domicile of persons aged 60 or over, with or without family support, in freedom and dignity and with citizenship".

The risk of falls can be monitored by means of validated scales for this purpose, such as the Morse Fall Scale[10] which was translated and adapted for Brazil in 2013[11] and validated in 2016[12]. This scale was validated for use in hospitalized patients and there is no knowledge of its application in LTCFs, nor of the use of any other specific scale for this population.

Based on the above, there is a need to identify the risk behavior for falls among elderly residents of an LTCF, justifying the present study. The research was therefore guided by the following question: What is the risk scenario for falls, based on the Brazilian Version of the Morse Fall Scale, and the occurrence of such events?

The objective of the study was (1) to identify the demographic and clinical profile, context of risk, and occurrence of falls among institutionalized elderly persons and (2) to analyze the association between the Brazilian version of the Morse Fall Scale classification of risk and the occurrence of falls among such individuals.

METHOD

A prospective cohort study was performed, with initial data collection and follow-up and evaluation of the occurrence of falls over a nine month period. The study was developed in two LTCFs (LTCF 1 and LTCF 2) in the city of Porto Alegre, Rio Grande do Sul, Brazil, from April to December 2016. The choice of these institutions was due to the fact that they were the two largest

LTCFs in the city. LTCF 1 was founded 87 years ago and is maintained mainly by the collaboration of the community, partner companies and service groups. It has a multiprofessional team that serves the elderly residents of the institution. It is one of the largest LTCFs in Rio Grande do Sul (RS) and houses elderly people in situations of vulnerability. LTCF 2, meanwhile, was founded 120 years ago, is a non-governmental, nonprofit organization with a multiprofessional service, and is considered the oldest LTCF in Rio Grande do Sul. The study population consisted of all the institutionalized elderly persons in the two LTCFs (235 individuals), 120 from LTCF 1 and 115 from LTCF 2. A sample calculation was performed to identify a suitable sample size for the study, considering a ratio of 50%, a sample error of 5% and a 95% confidence interval, resulting in a minimum sample of 147 elderly persons. All the elderly individuals were invited to participate and those who met the criterion of possessing adequate cognitive conditions to answer the questions, according to the mini-mental state exam, were included, resulting in a total of 193 elderly persons. Twenty-three individuals did not agree to participate in the study and 19 were excluded due to possible cognitive decline.

Data were collected by trained academics and health professionals using a guiding operational manual. Data collection was performed through the direct evaluation of the elderly persons and their medical records. The instrument was composed of sociodemographic variables (age, gender, length of institutionalization, schooling) and risk factors for falls and occurrence of falls [evaluation of musculoskeletal problems; visual and hearing impairment; medical diagnostics; suitability of footwear; hand grip strength; medications used; assessment of activities of daily living using the KATZ index[13]; degree of dependence according to RDC N° 283/2005[9]; the Brazilian version of the Morse Fall Scale (MFS-B)[11,12] and the occurrence of falls.

Each elderly person was evaluated at the beginning of data collection, however, the trained staff also evaluated those individuals who fell after the first evaluation on a weekly basis. Musculoskeletal problems were defined as yes or no based on the physical evaluation of the elderly and those referred to in their medical records, while hearing and visual impairments were self-reported by the elderly. The diagnoses of illness and medications in use data were collected directly from the records of the elderly and classified into groups.

Footwear was assessed for suitability and categorized into appropriate (covers the back of the foot and heel and is securely attached to the foot; or those not wearing footwear due to being bedridden) and inadequate footwear (covers the dorsum of the foot and heel and is not securely attached to the foot, or footwear that covers neither the back of the foot nor the heel, or that covers the back of the foot but not the heel).

Muscle strength was evaluated by the application of the Handgrip Strength Test (HST), using a dynamometer and an office chair (without support on the sides). The two hands, both dominant and non-dominant, were measured. Measurement was carried out three times, alternating between the dominant and non-dominant hand, with timed rest intervals of one-minute between each measurement. For the classification of handgrip strength, the maximal force obtained in the dominant limb by gender was used. Elderly women with a maximum strength of ≥11 kgf were classified as normal and those with a maximum strength of <11 kgf were considered to have reduced handgrip strength; while elderly men with a maximum strength of ≥18 kgf were considered normal, and those with a maximum strength <18 kgf were considered to have reduced handgrip strength[14].

The Katz Index is composed of six evaluative items: bathing, dressing, going to the toilet, transference, continence and feeding, which classify the elderly as either completely or partially dependent. All the elderly persons who were independent in the six evaluation items were classified as independent; those who were dependent in one to five items of the scale were classified as partially dependent and those who were dependent in all six evaluative items were considered totally dependent[13].

The degree of dependence established in RDC No. 283/20059 was also measured, with the following classification: degree of dependence I - independent elderly persons, even if they require the use of self-

help equipment; degree of dependence II – elderly persons who were dependent in up to three self-care activities of daily living, such as: feeding oneself, mobility, hygiene, who were not cognitively impaired or had a controlled cognitive disorder; degree of dependence III - dependent elderly persons requiring assistance in all self-care activities of daily living and/or who were cognitively impaired.

The Brazilian version of the Morse Fall Scale contains six evaluation items: history of falls (yes, has fallen in the last three months: 25 points, has not fallen in the last three months: zero points); secondary diagnosis (yes, has more than one diagnosis of illness: 15 points, not more than one diagnosis of illness: zero points); walking aid (does not use: zero points; totally bedridden: zero points; walks assisted by health professional: zero points; uses crutch/walking stick: 15 points; holds on to furniture/wall: 30 points); intravenous therapy/saline or heparinized intravenous device (does not use: zero points, yes, uses: 20 points); gait (normal/doesn't walk/completely bedridden/uses wheelchair: zero points; weak gait: 10 points; impaired/unsteady gait: 20 points); mental state (oriented/able to extent of capabilities/limitation: zero points; overestimates ability/forgets limitations: 15 points)[12]. The sum of the scores of each item generates a score for classification into low risk (0-24 points), moderate risk (25-44 points), high risk (≥ 45 points)[10,11].

Descriptive and inferential statistics techniques were used. The descriptive statistics used measures of central tendency and dispersion (mean and standard deviation) and absolute (n) and relative (%) frequency. The inferential part consisted of tests of association (Chi-squared and Fisher's exact). A significance level of 95% ($p \leq 0.05$) was applied.

The research project complies with Resolution No. 466/2012 and Resolution No. 510/2016 and was approved by the Research Ethics Committee of the Pontifícia Universidade Católica of Rio Grande do Sul, under approval No. 1,303,603. All participants signed a Free and Informed Consent Form (FICF) and in cases where the elderly persons were unable to sign the form, authorization was requested from the legal guardian.

RESULTS

Of the 235 individuals assessed, 19 were excluded due to possible cognitive decline and 23 due to refusal, giving a total sample for this study of 193 institutionalized elderly persons. The mean age was 79.04 (± 8.9) years, with a median of 80 years (61-98). The majority were women (n = 121, 62.7%). Regarding time spent in the LTCF, 64 (33.2%) had lived in the facilities for up to two years; 62 (32.1%), from 2.01 to 5.9 years, and 67 (34.7%) had been institutionalized for more than six years. As for schooling of the institutionalized elderly persons, 65 (33.7%) had an incomplete primary education, while the next largest group was illiterate elderly persons with 50 (25.6%). A total of 27 (14.0%) had completed elementary education; 20 (10.4%) were literate; 16 (8.3%) had completed high school; eight (4.1%) had a university education and seven (3.6%) elderly persons had an incomplete high school education.

Table 1 shows the data for the clinical variables related to visual and hearing impairment, diagnosis of pathologies, use of medications and classification of dependence or risk. The mean number of diagnoses of illness among the elderly was 3.6 (± 2.3), with a median of 3.0 (0-11). The elderly persons took an average of 6.2 (± 3.0) medications, with a median of 6.0 (0-15). Of the 149 elderly people who were able to perform the HST test, the mean strength in kgf in the dominant limb was 11.6 (± 7.3), with a median of 10.0 (0.0-39.3)

Table 2 presents the data for falls occurring after the first evaluation. Of the elderly persons evaluated, 53 (27.5%) fell after the first evaluation and two fell seven times. The morning shift was when the greatest number of falls was concentrated and the bedroom was where the greatest number occurred.

Table 3 shows data on the occurrence of harm, as well as the type of harm (physical, psychological or social), environmental and personal factors, and the report of the categorized context of the falls of elderly persons who fell after the first evaluation. Of the 53 elderly patients who fell, half suffered some type of harm, with physical damage being the most common in elderly persons with some type of injury.

Data on the association between falls and sociodemographic and clinical variables, such as visual and hearing impairment, number of diagnoses of illness, number of medications taken, as well as Katz score, degree of dependence, hand grip strength and risk of falls according to the MFS-B, are shown in Tables 4 and 5.

Falls were associated with some clinical variables, notably the Katz Index score, degree of dependence according to RDC Nº 283/2005, and risk of falls assessed by the MFS-B.

Table 1. Clinical characteristics of institutionalized elderly persons (N = 193) in two long-term institutions for the elderly. Porto Alegre, Rio Grande do Sul, 2016.

Variables	n (%)
Visually impaired	
Not impaired	33 (17.1)
Impaired	160 (82.9)
Hearing impaired	
Not impaired	87 (45.1)
Impaired	106 (54.9)
Diagnosis of illnesses	
No diagnosis	15 (7.8)
Up to three diagnoses	95 (49.2)
Four or more diagnoses	83 (43.0)
Katz Index Score	
Independent	84 (43.5)
Partially Dependent	51 (26.4)
Totally Dependent	58 (30.1)
Degree of dependency	
Degree of dependency 1	99 (51.3)
Degree of dependency 2	27 (14.0)
Degree of dependency 3	67 (34.7)
Suitability of footwear	
Suitable	108 (56.0)
Not suitable	85 (44.0)
Number of drugs	
Does not use medicines	5 (2.6)
Up to four medications	50 (25.9)
Five or more medications	138 (71.5)
Handgrip Strength Test (n = 149)	
Reduced female	75 (50.3)
Normal female	19 (12.8)
Reduced male	27 (18.1)
Normal male	28 (18.8)
Risk of falls according to Brazilian version of Morse Fall Scale (MFS-B)	
Low	35 (18.1)
Moderate	85 (44.0)
High	73 (37.8)

Table 2. Context of falls of institutionalized elderly persons who fell after the first evaluation in two LTCFs. Porto Alegre, Rio Grande do Sul, 2016.

Variables	n (%)
Falls after 1st evaluation (n = 193)	
Did not fall	140 (72.5)
Fell	53 (27.5)
Total falls	
None	140 (72.5)
One	34 (17.6)
Two	12 (6.2)
Three	3 (1.6)
Four	1 (0.5)
Five	1 (0.5)
Seven	2 (1.0)
Time of fall (n = 53)	
Morning	20 (37.7)
Evening	9 (17.0)
Night	15 (28.3)
Not reported	9 (17.0)
Fall Type 1 (n = 53)	
From own height	28 (52.8)
From chair/sofa/wheelchair	15 (28.3)
Not reported	10 (18.9)
Fall type 2 (n = 53)	
Fell to ground	47 (88.7)
Did not reach ground – was supported or supported self	5 (9.4)
Not reported	1 (1.9)
Fall site (n = 53)	
Recreation Room	4 (7.5)
Refectory	3 (5.7)
Courtyard	5 (9.4)
Bathroom	6 (11.3)
Consulting room	1 (1.9)
Nursing area	1 (1.9)
Bedroom	24 (45.3)
Hall	8 (15.1)
Not reported	1 (1.9)

Table 3. Characterization of the occurrence of harm and contributory factors for the risk of falls among institutionalized elderly persons who had suffered falls, from two long term care facilities for the elderly. Porto Alegre, Rio Grande do Sul, 2016.

Variables	n (%)
Occurrence of harm (n = 53)	
No harm	26 (49.0)
Suffered harm	27 (51.0)
Physical harm (n = 53)	
No	29 (54.7)
Yes	24 (45.3)
Psychological harm (n = 53)	
No	43 (22.3)
Yes	10 (5.2)
Social harm (n = 53)	
No	48 (90.6)
Yes	5 (9.4)
Total specific physical harm (n = 24)	
Edema	2 (8.3)
Bruise	3 (12.5)
Fracture	2 (8.3)
Skin Lesion	7 (29.4)
Local pain	2 (8.3)
Edema/hematoma	2 (8.3)
Hematoma/skin lesion	2 (8.3)
Edema/hematoma/skin lesion	2 (8.3)
Not reported	2 (8.3)
Specific psychological harm (n = 10)	
Fear of falling	6 (60.0)
Shame	2 (20.0)
Crying	1 (10.0)
Not reported	1 (10.0)
Specific Social harm (n = 5)	
Removal from activities	4 (80.0)
Not reported	1 (20.0)
Environmental factors (n = 53)	
Unsuitable gurneys	10 (18.7)
Slippery floor	8 (15.1)
Open wing division gate	1 (1.9)
Defect with wheelchair	1 (1.9)
Not reported	33 (62.4)
Personal factors (n = 53)	
Unsuitable shoes	15 (28.3)
Shaking	6 (11.3)
Not adhering to instructions	14 (26.4)
Unaccompanied	1 (1.9)
Visual impairment	1 (1.9)
Not reported	16 (30.2)

to be continued

Continuation of Table 3

Variables	n (%)
Fall context report (n = 53)	
Imbalance	12 (22.6)
Not reported	13 (24.5)
Slipped	12 (22.6)
Tripped	7 (13.2)
No restraints	2 (3.8)
Shaking	6 (11.4)
Unsuitable bed	1 (1.9)

Table 4. Association between falls and sociodemographic and clinical variables of elderly persons institutionalized in two long term care facilities for the elderly (N=193). Porto Alegre, Rio Grande do Sul, 2016.

Variables	n (%)	Falls		*p*
		No - n (%)	Yes - n (%)	
Gender				
Women	121 (62.7)	82 (67.8)	39 (32.2)	0.054*
Men	62 (37.3)	58 (80.6)	14 (19.4)	
Age				
Up to 79 years old	96 (49.7)	73 (76.0)	23 (24.0)	0.278*
80 years and over	97 (50.2)	67 (69.1)	30 (30.9)	
Schooling				
Illiterate	50 (25.6)	36 (72.0)	14 (28.0)	0.277**
Literate	20 (10.4)	12 (60.0)	8 (40.0)	
Incomplete elementary education	65 (33.7)	51 (78.5)	14 (21.5)	
Complete primary education	27 (14.0)	17 (63.0)	10 (37.0)	
Incomplete high school education	7 (3.6)	5 (71.4)	2 (28.6)	
Complete high school education	16 (8.3)	11 (68.8)	5 (31.3)	
University graduate	8 (4.1)	8 (100.0)	0 (0.00)	
Time in LTCF				
0 to 2 years in LTCF	64 (33.2)	49 (76.6)	15 (23.4)	0.685*
From 2.01 to 5.9 years in LTCF	62 (32.1)	44 (71.0)	18 (29.0)	
Over 5.91 years in LTCF	67 (34.7)	47 (70.1)	20 (29.9)	
Diagnoses of illness				
None	15 (7.8)	12 (80.0)	3 (20.0)	0.261**
Up to three diagnoses of illness	95 (49.2)	73 (76.8)	22 (23.2)	
Four or more diagnoses of illness	83 (43.0)	55 (66.3)	28 (33.7)	
Total medications				
Does not use medications	5 (2.6)	5 (100.0)	-	0.132**
Up to four medications	50 (25.9)	40 (80.0)	10 (20.0)	
≥ Five medications (polypharmacy)	138 (71.5)	95 (68.8)	43 (31.2)	

* Pearson's Chi-Squared; ** Fisher's Exact.

Table 5. Association of falls with clinical variables of institutionalized elderly persons (N = 193) from two long-term care facilities for the elderly. Porto Alegre, RS, 2016.

Variables	n (%)	Falls		*p*
		No - n (%)	Yes - n (%)	
Visual impairment				
No	33 (17.1)	23 (69.9)	10 (30.3)	0.688*
Yes	160 (82.9)	117 (73.1)	43 (26.9)	
Hearing impairment				
No	87 (45.1)	72 (82.8)	15 (17.2)	0.004*
Yes	106 (54.9)	68 (64.2)	38 (35.8)	
Hand Grip Strength (n = 149)				
Reduced female	75 (50.3)	47 (62.7)	28 (37.3)	0.004*
Normal female	19 (12.8)	16 (84.2)	3 (15.8)	
Reduced male	27 (18.1)	19 (70.4)	8 (29.6)	
Normal male	28 (18.8)	27 (96.4)	1 (3.6)	
Katz Index Score				
Independent	84 (43.5)	76 (90.5)	8 (9.5)	<0.001*
Partial dependency	51 (26.4)	30 (58.8)	21 (41.2)	
Total dependency	58 (30.1)	34 (58.6)	24 (41.4)	
Degree of dependency				
Degree of dependency 1	99 (51.3)	87 (87.9)	12 (12.1)	<0.001*
Degree of dependency 2	27 (14.0)	17 (63.0)	10 (37.0)	
Degree of dependency 3	67 (34.7)	36 (53.7)	31 (46.3)	
Suitability of footwear				
Suitable	108 (56.0)	85 (78.7)	23 (21.3)	0.031*
Unsuitable	85 (44.0)	55 (64.7)	30 (35.3)	
Risk of falls				
Low risk	35 (18.1)	29 (82.9)	6 (17.1)	0.012*
Moderate risk	85 (44.0)	67 (78.8)	18 (21.2)	
High risk	73 (37.8)	44 (60.3)	29 (39.7)	

* Pearson's Chi-squared.

DISCUSSION

The present study describes the demographic and clinical profile and the context of risk and the occurrence of falls among institutionalized elderly persons. The participants were mostly women. The predominance of women in LTCFs is due to the fact that this segment of the population has a longer life expectancy[15].

A total of 34.7% of the elderly persons had been institutionalized for more than 5.9 years. A study carried out with elderly persons in an LTCF in the state of Bahia found that the predominant period of institutionalization was 1 to 10 years among the majority of the elderly[16]. The findings indicate that the majority of the elderly persons had low levels of schooling, with the largest proportion having an incomplete primary education, followed by illiterate individuals. This finding is similar to that of another study, which found that the majority of the elderly were illiterate (25.5%) or had a low level of education (59.6)[17].

The majority of the elderly persons evaluated were visually impaired, however, this variable was not associated with the occurrence of falls. These data corroborate another study, which found that the majority of the elderly had problems with vision[16].

In terms of hearing impairment, more than half of the elderly persons had some degree of deficiency. These findings were associated with the occurrence of falls. This risk factor is related to senescence, when there is a decline in hearing; as the ear is also responsible for body balance, disturbances in this sense organ can cause the occurrence of falls. A study that evaluated the risk of falls in elderly people living at home reinforces this finding, as impaired hearing was associated (p=0.001) with a high risk of falls[18].

Almost half of the elderly persons had up to three diagnoses of illness. However, almost the same percentage had four or more such diagnoses, most frequently between four and seven. These data show that the elderly persons assessed had poor health conditions, which requires greater care from the professionals responsible for this population. While worrying, this factor was not associated with falls in the present study. A study conducted in a region of Minas Gerais showed that the majority of the elderly (38.2%) had two to three types of diagnoses of illness[19].

In the evaluation of performance by the Katz Index, it was found that the largest proportion of the elderly independently performed six items on the scale, while the next largest group was those who were totally dependent. The high degree of independence of the institutionalized elderly is due to the profile of one of the institutions, as it accepts only independent elderly persons.

The Katz Index score was associated with the occurrence of falls. Literature[17,20] suggests that the elderly should be encouraged to perform their activities of daily living in order to maintain their independence longer, with institutionalization representing a limiting factor. A study that correlates the risk of falls and functional autonomy in institutionalized elderly persons shows that there is an association (p = 0.001) between the Katz Index score and the occurrence of falls[20]. In another study, in the evaluation of the performance of basic activities of daily living by the Katz Index, it was found that the majority of the elderly were independent (93.6%)[17].

In relation to the degree of dependency defined by RDC Nº 283/2005, the greatest percentage of the elderly persons were classified as degree of dependency 1, followed by degree of dependency 3. No studies were found relating the RDC Nº 283/2005 degree of dependency with the risk of falls. However, this classification was associated with the occurrence of falls. The purpose of RDC No. 283/2005 is to define rules for the functioning of LTCFs in order to guarantee the elderly population the rights guaranteed by current legislation, seeking to prevent and reduce the health risks of elderly people living in LTCFs, as well as to define and implement what measures should be taken regarding the degree of dependence of this population. Thus, further studies are needed to address degree of dependence and its relation to falls, so that care can be increased to prevent falls in this population.

The present study found that the majority of the evaluated elderly persons had adequate footwear. However, the use of inadequate footwear has been found to be associated with falls. A study of 42 elderly persons who fell found that 36 (85.7%) used inadequate footwear and only six (14.3%) used adequate footwear[21]. The present study corroborates these data, reinforcing that this may be one of the contributory factors for falls. It is known that LTCFs receive footwear donations, which suggests a need for sorting the type of footwear received, in order to establish safety restrictions related to this item, which can be one of the factors that triggers falls in the elderly.

There is a greater predominance of the use of five or more mediations, which characterizes polypharmacy, which is defined as the simultaneous use of five or more medicines[22]. A small proportion of the elderly did not use any type of medication, while some elderly persons took 15 different types of medications in a single day. However, although the use of multiple medications and their possible interactions is alarming, this factor was not associated with falls in this study. The data corroborate two other studies, one in Belo Horizonte, Minas Gerais, which reported that 91.5% of the elderly were using medications[20] and another study which tested the association between the quantity of medications used

and the presence of falls, and found no significant statistical relationship[16].

HST evaluation showed that the institutionalized elderly men and women have reduced strength in their dominant hand, and that this variable was associated with falls. HST measurement is one of the predictors for assessing the strength of the elderly and their functional capacity, and may be related to the risk of falls. A study with the elderly illustrated the difference between the hand grip strength means of elderly persons who fell and those who did not fall after institutionalization. A large part of the elderly persons residing in the community who had fallen had a lower HST score (11 to 20 kgf) than those who had not fallen (21 to 30 kgf)[23].

Regarding the classification of the risk of falls defined by the MFS-B, the largest proportion of elderly participants of the study exhibited moderate risk, followed by the group with a high risk of the occurrence of falls. The risk of falls according to the MFS-B was associated with falls. The use of scales to evaluate the risk of falls may anticipate the identification of elderly individuals with a potential for falls. Although there are no studies that apply the MFS-B in LTCFs, it is widely used in the hospital environment to identify the risk of falls in hospitalized patients. A study using the MFS in the hospital context found that moderate and especially high risk was associated with the occurrence of falls (p=0.000)[24].

During the study a notifications book was created to record the falls that occurred in the two LTCFs, with the aim of identifying factors that could contribute to such events, in addition to the application of the MFS-B. In the period from April to December 2016, 27% of the elderly participants in the study suffered falls, representing a high percentage for a population living in a LTCF. Of the 53 elderly people who suffered falls, 34 fell once, 12 fell twice and two fell seven times. This shows the need for the creation of surveillance measures among elderly persons who fall and prevention measures for those who had not fallen.

The highest occurrence of falls was during the morning shift, followed by the night shift. The morning is the period of greatest activity in institutions, during which the elderly perform their hygiene routines. The morning shift was also related to the occurrence of falls in other studies[21].

As for the type of fall, falls from the individual's own height and falls to ground predominated. A fall from one's own height is described as a public health problem, as well as resulting in serious consequences for the elderly when they strike the ground. In relation to external factors, these falls can be predicted and avoided through health education and by providing a suitable environment for the institutionalized elderly persons.

The most frequent place for falls was the bedroom, followed by the hallways and bathrooms of the institutions. Knowing the location of the falls is important so that risk prevention initiatives can be taken, since there are numerous factors that predispose the elderly to falling. The same sites have been described in other studies with institutionalized elderly people[21,25].

Harm from falls is poorly addressed in studies, especially psychological and social harm. In this study, half of the elderly presented some type of harm, which was classified as physical, psychological or social. In almost half, the elderly who fell exhibited physical harm, with skin lesions being the most frequent, followed by bruising. However, there were elderly individuals who exhibited up to three types of physical harm at the same time. Alvares et al.[25] reported in their study that one of the main consequences of falls are ecchymosis or skin lesions. The psychological impact of falls can include fear of falling and loss of confidence, and both can result in social isolation[26].

In the context of the fall itself, imbalance and slipping were reported by the elderly as the cause of the fall. Imbalance may be associated with factors of aging itself, while slipping is associated with environmental and personal factors. Factors that can be predicted. A study that described the reason for the occurrence of falls in the elderly found that imbalance and slipping are among the main factors[25].

Limitations of the present study were the lack of a daily evaluation by the researchers. However,

the care team was trained to apply the MFS-B and for the notification of the broader context of falls. Another aspect that needs further investigation in future studies is the analysis of elderly persons with cognitive impairment, in order to better understand the risk factors of falls in this population. Furthermore, as the MFS-B cannot be used for this segment, prediction studies should be performed, as one of the items of the scale relating to the use of an intravenous treatment device always scored zero, as the elderly persons in the LTCFs investigated did not use this type of treatment. These aspects constitute a limitation of the study and a gap in the research which future studies can fill.

CONCLUSION

The present study achieves the proposed objectives by describing factors associated with the occurrence of falls in institutionalized elderly persons. It has been observed that falls are a frequent occurrence in the life of the elderly and bring with them the presence of harm, not only physical, which can impact the health of such individuals.

The factors associated with falls in the present study were also described in other studies, reinforcing the idea that there is no single causal agent of this event. In this way, multifactorial causes require knowledge of and adherence to multidisciplinary actions, in order to identify elderly persons at risk and establish effective and efficient prevention measures, with the purpose of reducing the harm related to this event. The classifications of risk in the Brazilian version of the Morse Fall Scale were associated with the occurrence of falls. However, this scale requires validation for use in long-term care facilities for the elderly. This study is in the implementation phase.

In view of the findings, the implementation of care protocols for the prevention of falls is recommended. These should employ a multidisciplinary approach to minimize the occurrence of this event, which is extremely harmful to elderly persons residing in long-term care facilities, and to ensure their general safety.

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Perceptions of the elderly and their relatives about aging

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Abstract

Objective: to identify the meaning of aging as perceived by the elderly and their relatives. *Method*: an exploratory, descriptive and qualitative study was carried out in 2014, based on semi-structured interviews with eight elderly participants of a social group and five relatives of elderly people. The information was synthesized using Bardin's content analysis, from the description of the subjects' speech in terms of units of significance. *Results*: content analysis revealed two thematic categories: the meaning of aging in the perception of the elderly and human aging in the understanding of the relatives. *Conclusion*: the perceptions of the interviewees regarding aging refer to successful, dignified and active aging, with autonomy, independence and the possibility of accomplishment, considering the specificities and difficulties of understanding the process of living and coexistence between family members. The caregivers reported concerns about the future of the elderly in terms of health, dependence, and physical, psychic and social limitations, with a combination of positive and negative feelings, but recognized their responsibility of care.

Keywords: Elderly; Caregivers; Family; Aging; Perception.

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INTRODUCTION

The Brazilian population is aging rapidly yet has not solved its social and political problems, inheriting a history of inequalities and elitism[1]. With a larger elderly population, a greater number of poor elderly persons are envisaged, as the "socioeconomic, political, and cultural transformations that occurred in society in the 20th century have brought significant changes in the lives of individuals"[2].

Such a demographic scenario triggers new medium and long term demands. Public policies, training institutions for professionals and researchers, society and family groups will be increasingly called upon to contribute to healthy aging, which is the art of living well with a good quality of life. Among the main factors in this process of aging are the maintenance of functional capacity, the practice of physical activities, the control or absence of chronic diseases, the acceptance of biopsychosocial changes, health, autonomy, independence and creativity, avoiding depression, being happy with one's home environment and having friends, social insertion and seeking means of learning.[3]

Of the innumerable problems of the aging process, some are more directly related to the areas of social and human sciences. They are concerned, by their nature, with perceptions of the different ways of dealing with old age, and depend on socioeconomic profile, schooling and family configuration.

The family environment is considered a priority area for the permanence and care of the elderly person. However, in order to understand the process of aging, it is necessary to take into account life history and the family, social, economic and cultural reality of the individual, especially the role of women as caregivers[4,5,6]. Thus, for Carvalho and Neri[7], the role of the family caregiver is an "enterprise that unfolds in day-to-day, individual and family time, competing with the work, social participation and family commitments of the caregiver".

The family institution has undergone profound transformations, becoming increasingly dynamic and less homogeneous. In historical terms, family ties exceed parameters of consanguinity, as they are also based on affectivity, coexistence and mutual relations of care and protection between individuals. The contemporary family is characterized by different compositions of the family nucleus. The idea of the nuclear family, composed of father, mother and children, is no longer a relevant model. However, the family continues to play an essential role in the lives of individuals, generating identity, language, culture and care[2,6,8,9].

The purpose of this study is to understand the meaning of aging in the perceptions of the elderly and their family caregivers.

METHOD

An exploratory, descriptive and qualitative study was performed, based on semi-structured interviews conducted with eight elderly people from a social group and five family caregivers of the respective elderly people, carried out in 2014. The participants of the study were randomly selected from a total of around 60 elderly persons in the group, based on probabilistic sampling. The inclusion criteria were: age 60 years or over and, for the family members, living with the elderly person and performing the role of caregiver. The interviews were performed by the authors of the study, according to the availability of each participant, and recorded and transcribed, subject to the signing of a Free and Informed Consent Form.

The study was approved by the Research Ethics Committee of the university (Opinion No. 732.873). The script of the interviews with the elderly comprised questions about age, level of schooling, past life, daily life, aging and relationship with family. For caregivers, the interview was based on age, kinship, occupation, the aging process and difficulties in the daily care and routine of the elderly.

Data from the interviews were analyzed using the Bardin content analysis technique[10]. The practice of content analysis involved the description of the content of the discourse, identifying indicators that allowed knowledge of the different perceptions of aging of the elderly and their family caregivers to be inferred. According to the research objective and as a result of the information, two categories emerged: the meaning of aging in the perception of the elderly and human aging in the understanding of family members.

RESULTS AND DISCUSSION

The meaning of aging in the perception of the elderly

The age of the participants ranged from 64 to 77 years. All were married, had children, were retired, and lived in their own homes, with a relative as a caregiver. Four resided in the rural area and three in the urban area of the municipal region. The average monthly income was equivalent to the minimum salary.

The narratives of the elderly revealed their perceptions about the process of aging, considering it a normal, natural and inherent step of the human condition:

> "For me, aging is that when we are born we are children, and then we mature, and so we reach old age" (E 1).

> "I don't care much about getting old. I know that everyone will one day grow old. Those who are young today will one day be old" (E 6).

It was also recognized that "getting old" is part of existence and that it is impossible to turn back the clock, meaning that it is necessary to adapt to this new reality and experience the moment as it presents itself. For Sá et al.[2], human aging is a universal, complex, dynamic, progressive, multidimensional, interdisciplinary process with "biological, social, psychic and spiritual aspects." It is a phase that requires adaptation and acceptance of one's specificities, and can be lived through healthily. The participants also understood that aging is a process that begins in childhood and that the experiences of the past reverberate today.

> "All the work we did in childhood, working from sun up to sun down, with no rest, threshing soy, plowing with an ox, it was all the start of our illnesses, pains. So today everything hurts and comes from that time. We did not take care of ourselves, we hardly went to the doctor. Ever since I was 12 years old I have worked a lot," (E 8).

> "There were days when I was in the fields all day, weeding, because we didn't have any poison then, I got home very late, very tired and then there was no food. I went to bed hungry so many times. All these difficulties reappear today and reverberate in our lives. [...]. It's impossible to be healthy." (E 7).

From these words, it can be inferred that if the elderly had had less difficult adolescences and childhoods, they could have reached a healthier old age. Thus, there are those who are 60 years old and no longer work; while others, aged 90, are still active. For the WHO[3], the problems of old age are linked to the social determinants of aging, and the limitations between health and disease. This concern can be seen in the discourse of the elderly.

On the other hand, if the elderly individual has positive health conditions, they can experience old age with a good quality of life[6,2], with autonomy, independence, family life and social groups. In this way, negative representations are still a reality in terms of health conditions. For Tong et al.[11], the perceptions of aging are synonymous with the limiting and loss of one's social role, which is still common, as the discourse reveals:

> "Aging is a time of change, we no longer have the same agility we had when we were 18 years old. [...]. In these situations you can see that elderly people need care, as we end up becoming depressed, if isolated. After I turned 40, I realized that my body had changed." (E 6).

> "Aging is a process of wear and tear, limitations, pains arise, we begin to look ugly, we have difficulty walking. Depending on the day, sometimes it's so hard to do things that we don't even want to get out of bed" (E 4).

The main changes identified include a lack of agility when performing daily tasks, pain, discomfort, poor motor coordination, cognitive decline and memory loss. Afram et al.[12] emphasized that the changes of the aging process, especially the reduction of functional capacity and cognitive decline, are not accepted by the elderly. There is, however, a need and challenge to adapt to the new reality and seek resilience.

Concerns about isolation are also mentioned, as this can generate anxiety and depression:

> "Lately, due to the aging process, I've ended up isolating myself, because I find the process a bit sad, I don't see any happiness, only difficulties" (E 3).

> "I always felt really happy, but when I got older, things changed a lot, and sometimes we suffer. When I saw that I couldn't do some things that I like, I felt bad and only thought about silly things, so much so that I had to take medication, I was going crazy, it's sad" (E 7).

The feelings described reveal a loss of friends, changes in the body, and the lack of coexistence with the family. Feeling sad is a common response to the limitations of solitude, social isolation, and difficulties in keeping up with societal changes[6,10]. In this sense, contact with others, dialogue and care are fundamental for dealing with this existential phase. Sharing experiences, expressing frustrations, and talking about anxieties and distress are healthy forms of therapy, capable of generating autonomy, empowerment and self-esteem[12].

Another factor mentioned was depression. Studies show that living alone produces social isolation and increases the possibility of triggering depressive symptoms, a condition that affects health, well-being and lifestyle[9,5,3].

Work was also one of the themes most mentioned by the elderly. They described memories of "the old days". Work has always been a part of life, and with aging the elderly exhibit feelings of failure. However, they did not express a desire to stop performing their activities:

> "I suffered a lot because of depression, after I stopped working, and over time I saw that I couldn't do anything [...], I couldn't take this life" (E 6).

> "Work is what gives us the energy to continue. We forget about our problems. If I stay still I'm sure I'll get sick. I think that people who have worked since childhood can't get rid of the habit. [...]. When I work, I'm happy." (E 7).

A diminished ability to work is one of the causes of depression and suffering. According to Derrosso and Oliveira[13], "with an increase in life expectancy, the elderly tend to remain in, or seek a place in the labor market. [...]. Retirement means major losses, both because of the need to maintain their income and that of their family," as well as the loss of individual and social identity. In contemporary society, a person is valued for their production and wealth:

In western and capitalist society, any valuation is based on the basic idea of productivity inherent in capitalism itself. In this way, the individual, with the diminution of working strength characteristic of old age, becomes someone who is incapable of producing, losing their role in society, where values related to the capacity for work and independence predominate, and their condition is devalued[14].

Many elderly persons became emotional when discussing old age. They expressed the joy of living in a group and reaching old age, but also sadness due to a lack of vitality and being dependent, and mentioned the possibility of transcending these difficulties and living happily. They emphasized that meaning lies in living in the moment, valuing the knowledge and wisdom inherent in life and having projects, such as spirituality/religiosity and spaces of sociability. Almeida et al.[9], in a study carried out with 40 elderly people from a social group on feminization in old age, found that aging brings benefits, such as "being healthy, going out and taking trips, going to *forró* dances, walking, carrying out one's ordinary activities and having one's own money". A study by Jonsén, Norberg and Lundman[8], with ten elderly persons aged 85-95 years, using interviews, also revealed that satisfaction with life requires self-esteem, self-care, and a passion for beauty, joy and happiness.

Human aging in the understanding of family members

A total of 60% of the family members were aged between 20 and 35 years, and 40% were between 35 and 50. Of these relatives, 40% were single and 60% were married. In terms of degree of kinship, 80% were daughters and 20% were daughters-in-law. Despite the new family configurations, male figures continue to perform the role of working outside the

home. Although women are increasingly present in the labor market, they are still expected to assume the role of caregiver for the elderly[15]. It should be emphasized that this role of family caregiver has been historically constructed and is based on the "cultural and social values of the first half of the last century, in which women assumed a domestic role, and therefore did not need to study"[7].

The family is present in the process of aging, being responsible for care, among other things. The conceptions of aging are perceived from the particularities of each family arrangement, socioeconomic conditions and cultural and moral values. In view of this, the family caregivers interviewed were all female and lived with the elderly persons. Cardoso et al.[5] stress "that care is exercised, most of the time, by women ... - wives, daughters and grandchildren." Furthermore, all the caregivers had jobs and did not depend on the income of their elderly relative. Thus, the income/benefits of the elderly are, in principle, used for their own livelihood. It should be noted that in the case of the elderly contributing to family expenses, is considered "a little extra help". The narratives of the family caregivers reveal that once one has defined who is responsible for the care of the elderly, this responsibility is not only seen as an obligation but as repaying the dedication of parents experienced throughout life:

> "I feel good taking care of the elderly, because one day we will get old too and will need to be taken care of in the same way" (F 3).

> "I do not see any problem in taking care of my father and my mother, after all they still look after themselves. All my brothers and sisters would take care of our parents, because they recognize the importance they have had in our lives." (F 5).

> "I feel good when I take care of my mother, after all she gave me life, taught me the values, that make me the human being that I am today" (F 2).

In a study on the same theme, Cardoso et al.[5] emphasize that care is seen as a form of repaying the dedication of parents in the past. The family interviewees reported that the care given to the elderly person is an example for other generations, who will receive the same care in the future.

It was noted that the time spent by family members meeting the needs of the elderly did not represent a barrier to their professional activities. However, due to the complexity of the care process, we sought to identify the relationship between the relative and the elderly person:

> "Our relationship is not the best. I think I leave a little to be desired, but also the elderly person should respect the people they live with" (F 1).

> "The relationship is quite relaxed. Sometimes we argue, but soon we understand each other, I like the culture and the process. I accept them the way they are. Of course we cannot forget that there are days when the relationship is more conflictive" (F 3).

> "I get on well with him. I always try to understand the elderly person, although I can see that we are different to each other, this is because he has the habits from his time, which was different. Sometimes this change causes conflicts because my children think that the elderly have to adapt to modernity" (F 2).

For Cardoso et al.[5] and Carvalho and Neri[7], there is often burden in the activities of caregivers, accompanied by a lack of free time when taking care of their private lives, as well as physical and emotional exhaustion resulting from conflicts. The study by Afram et al.[12] also describes the burden of informal caregivers, especially those who care for the elderly with dementia.

The family members identified that there is a cultural shift associated with the process, as the elderly have their own worldview, inherent in their culture, and conflicts are often unavoidable in everyday relationships. There are cases where the elderly lack freedom and autonomy; while in other situations they make the decisions, as reported below:

> "My mother wants to be in charge of everything: how to do things, how others should do them. If she sees that someone is abusing an old man, she gets involved, and I say, "Mum, be quiet, why do you say these things; sometimes I am embarrassed [...]. I admit it! I will often turn my back on her." (F 2).

> "Sometimes we sit down to decide a family problem, and then mum and dad tell us what they think. One day my son told his grandfather to be quiet, that he doesn't know anything. Then we argued with him and among the family and made it clear that while his grandfather had limitations, he couldn't say what he wanted" (F 5).

It was identified in 80% of the interviews with relatives that the decisions are made by the elderly, while only 20% said that the elderly person is no longer listened to, claiming that "they're no longer aware of their actions." As such, in relation to the question "How do you view the aging process?" some excerpts from the discourse are shown below:

> "It is a stage in the life of the person, because you start as a child and develop and old age is another step. A child has one way of life, a teenager another, while in old age the experience is also different" (F 5).

> "I realized that the aging process brought changes, because before my mother did the chores, but now I see that she can no longer do anything, she has limitations, pains in her legs, arms and spine" (F 2).

The answers revealed that the majority identified aging as a process of changes, most of which are physical. The respondents know that the body changes and feel that the family needs to understand these changes, avoiding frustration for the elderly. Ferreira, Bansi and Paschoal[16] state that there is still a mentality of associating old age with disease. In this sense, the family has concerns about the likelihood of illness in the future.

> "So far everything is alright with my mother, I'm just afraid that from now on she will start to get sick because she's already a good age, and if she gets sick then it's going to be difficult. I took care of my father before he died, spent days in the hospital, but I'm not ashamed to say it, the worst part of aging is sickness" (F 2).

> "My mother-in-law spends her life at the doctors, skin disease, everything. After she reached the age of sixty, she began to get sick, and it's continued, it's always about her health. When she was younger she wasn't so sick. I realize that my routine has changed because of her health" (F 5).

For caregivers, the relationship between old age and health appears as a central concern, because illness can affect their professional activities. However, it was observed that this situation also occurs because the relative is not prepared or equipped with information to provide a quality service. Thus, "for care to be performed well, the preparation and proper choice of the caregiver are fundamental"[13].

There is a need to consider the family as rights holders, based on public policies of care for the elderly:

> "I believe that the policies are effective, but I think that if you invest more in prevention, information and support, the elderly will be much better taken care of." (F 2).

> "I can say that the elderly have been protected, they have laws that guarantee that they are well taken care of, but we are human beings too, right, and we also need rights, that someone listens to us, because they don't" (F 5).

The institution of the family needs to be protected so that it can protect its members. The protection of family members does not depend only on family relationships, but also on the State, through work, housing, food, health conditions, and safety[3,5,15]. The relatives reported that the aging process has benefits, such as life experience, retirement, specific health care and access to rights:

> "I think when they reach this age, they have a lot to tell us, they have very important values and life stories, which are the basis for our life. We learn to live from their teachings" (F 3).

> "I love to hear my mother tell old stories. They have lived through so many things and for them to tell them how they faced them is very gratifying. They know many things that we don't" (F 4).

In general, family members expressed positive feelings towards the elderly in this stage of life and believe that they have the wisdom to make a contribution, through their prudence, balance, knowledge and life experience when faced with day to day challenges. However, there were some feelings

of insecurity, fatigue and fear among caregivers, in relation to their excessive daily workloads, with no time for fun or relaxation[10,8,14,15]. The WHO[3] document points out the need to understand the specificities, rights and expectations of the elderly and their families.

However, the following statements reveal the conflicting feelings of the family, regarding care, responsibility and imminence of death: fear of the death of the elderly person (F 1); fear of not being able to help my parents, of losing my strength due to the exhausting nature of care (F 2); uncertainty regarding my personal life (F 3); fear of the aging of the elderly and insecurity about the future (F 5). For this reason, daily time management helps "caregivers" to organize themselves, have a sense of the continuity of life, maintain a sense of control and to feel secure in relation to the tasks they perform every day"[6]. With advancing age, death has a different meaning, as it appears as the possibility of impossibility, in other words, as it becomes imminent, all existential projects cease, as "its presence is taken for itself, in the disposition of anguish, revealing itself in an original and profound way"[4]. Finally, with the passage of time, the responsibilities of relatives in relation to care, responsibilities and search for biopsychosocial well-being with their elders increase.

CONCLUSION

According to the objective of the study, which is to understand the meaning of aging in the perception of the elderly and their families, the elderly participants perceived the aging process as on the one hand involving a sense of achievement and the autonomy, independence and willingness to overcome daily difficulties, and presented an active, dignified and healthy social imaginary, different from the commonly held conception. On the other hand, however, the impairment of functional capacity, diseases, diminished work performance, intergenerational conflicts and cognitive decline were presented as limiting, but inherent to life.

The family caregivers mentioned the fear and insecurity related to the possibility of the elderly being dependent in terms of functional, psychic and social capacity, requiring greater and greater care. They are aware that, according to the National Policy of the Elderly and the National Health Policy of the Elderly, the family or the caregiver, no matter how limited, is responsible for the integral care of the elderly. Therefore, it is necessary to prepare family members for the future, providing them with information and enabling them to share their experiences and emotions, minimizing the conflicting aspects of these relationships, as it is the family, which is undergoing structural transformations in its modes of living and exercising care, that is responsible for caring for its elderly.

It is also necessary to mention the importance of further studies on the subject, expanding the sample, both with the elderly and their family caregivers, and investigating more deeply issues such as finitude, religion and religiosity in the behavior of the elderly, realities and values that are inherent to the process of human aging.

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The Cognitive Telephone Screening Instrument (COGTEL): a reliable and valid tool for the assessment of cognitive functioning in the Brazilian elderly

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Abstract

Objectives: To study the reliability/stability of the Cognitive Telephone Screening Instrument (COGTEL) for the assessment of cognitive functions, and to investigate the concurrent validity (that is, the relationship between the COGTEL scores and external variables, such as level of education and MMSE results) in a pilot study of elderly persons residing in the community in the municipal regions of Apuí, Fonte Boa and Manaus (Amazonas, Brazil). *Method:* This pilot study included 90 elderly persons (29 men and 61 women) aged 60-85 years of age [68.2 (± 6.7)]. The COGTEL, the MMSE and socio-economic survey were applied in the form of two interviews, a week apart and under the same conditions. *Results:* The test-retest intraclass correlation coefficient of the COGTEL total score (and respective six subtests), MMSE and educational level ranged from acceptable to high ($0.708 < R < 0.946$). There was a strong positive correlation between the total score of the COGTEL with the MMSE ($r = 0.682$; $p < 0.001$), as well as with educational level ($r = 0.604$; $p < 0.001$). *Conclusion:* This study presents preliminary evidence of the reliability/stability and concurrent validity of the COGTEL in the evaluation of cognitive functions in elderly persons residing in the community. The results of this study support the use of COGTEL as a short, reliable and valid instrument for analyzing differences in cognitive functioning in inter-individual studies with elderly persons.

Keywords:
Cognition. Geriatric Assessment. Healthy Aging. Mental Status and Dementia Tests. Cognitive Telephone Screening Instrument.

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INTRODUCTION

The Mini Mental State Examination (MMSE) is one of the most widely used triage or screening tests for the assessment of changes in cognitive functions in both epidemiological studies and clinical settings. It includes orientation, memory, attention and calculation, language and constructive capacity tests[1], and has been successively improved by considering variables such as age, schooling and the definition of specific regional cutoff points. Generally, the MMSE is recognized as a valid instrument that is easy and quick to apply[2]. This is one of reason why it has been extensively included in many epidemiological studies, as well as in studies of aging that seek to assess cognitive functions. However, the use of MMSE alone may result in limitations, particularly in studies with individuals residing in the community who have aged healthily in terms of cognitive functioning[3,4]. This means that the test may not be sensitive enough to differentiate individual performance levels, as it is restricted by its ceiling effect, which makes it difficult to assess and monitor interindividual differences in cognitive functioning[5,6].

The Cognitive Telephone Screening Instrument (COGTEL)[3] battery of tests may be a useful alternative in this respect, as it allows the detailed evaluation of performance in six cognitive domains (prospective, short-term, long-term and working memory, verbal fluency and inductive reasoning) using tests adopted from well- established neuropsychological instruments such as the Wechsler scales, and additionally including a total score that is indicative of general cognitive functioning[3,4].

Thus, the COGTEL can be widely applied in the evaluation of cognitive functions, as it differentiates total cognitive function performance, and identifies not only cognitive deficits but also interindividual differences in cognitive functioning within the range of healthy performance[4]. In addition, the COGTEL can be applied in a flexible manner through either face-to-face or telephone interviews, and takes 10 to 15 minutes to complete[3].

The presentation and evaluation of the psychometric properties of the COGTEL described in this article include the application of the instrument with a sample of elderly adults living in the community in Brazil. To evaluate the reliability of the test, we asked the participants to undertake the COGTEL at two different times (test-retest method). Concurrent assessment was examined, calculating the degree of association between COGTEL scores, MMSE score and level of schooling. Most neuropsychological investigations of the impact of sociodemographic factors on cognitive ability have focused on the role of education[7], as it has been shown to be an important determinant of cognitive performance[8].

The objectives of the present study were: (1) to study the reliability/stability of the COGTEL instrument in the evaluation of cognitive functions, and (2) to investigate concurrent validity (i.e. the relationship between COGTEL scores and external variables such as schooling and total MMSE score) in a pilot study in elderly adults living in the community in the state of Amazonas, Brazil.

METHOD

Study design and sample

The present pilot study included 90 elderly adults (29 men and 61 women) aged 60-85 years [68.2(±6.7)]. The present study is part of the "Health, Lifestyle and Aptitude in Elderly Adults from Amazonas" (SEVAAI) research project. The elderly adults were residents of the community from Apuí, Fonte Boa and Manaus (municipal districts in the state of Amazonas, Brazil). To test the reliability of the assessment instrument, 90 elderly adults were reassessed for all the variables seven days after the first evaluation[9]. The evaluations took place in each of the municipal districts in partnership with the local institutions: the Amazonas Federal Institute of Education Science and Technology; the Open University of the Third Age of Amazonas State University; the Social Care Reference Center; the Oscar de Paulo Portela Municipal Library and the Paulista Social Center for the Elderly.

The study field team comprised 21 members: four students from the Master's in Physical Activity and Sport course of the University of Madeira (UMa), Portugal; 15 undergraduate students of the Licentiate degree course in Physical Education of Amazonas State University (UEA); a student from the Uninorte

Physical Therapy course; and an undergraduate degree student from the Federal University of Amazonas (UFAM).

To maximize the consistency of the evaluations, training sessions were conducted with all members of the field team. Firstly, a theoretical explanation of the evaluation protocols and their tests was created. Secondly, the tests and questionnaires were applied among the members of the field team. This training phase lasted one month, with three training sessions per week, each lasting three hours. Thirdly, evaluations were conducted with elderly individuals to calculate the protocol administration times. On the day of the pilot study tests, all the research protocols were explained so that the elderly persons fulfilled the requested tasks.

Inclusion and exclusion criteria

The inclusion criteria of the sample considered in this study were: be a male or female resident in the community aged between 60 and 90 years of age; be autonomous and independent in the accomplishment of activities of daily living, and to have no reported health problems considered absolute contraindications to the practice of physical activity[10].

The following exclusion criteria were used in the present study: to have a low level of physical functionality (assessed by the physical functionality questionnaire[11]; physical functionality questionnaire score <12/24 points); have severe cognitive deficits (assessed by MMSE)[1], MMSE score <15/30 points[2], or severe hearing loss; have a co-morbidity that could compromise participation in physical activities (acute illness, progressive neurological diseases, stroke, unstable chronic conditions)[10], or any of the following conditions: (1) individuals who had been advised by their doctor not to exercise because of medical conditions; (2) those with congestive heart failure; (3) people who had experienced joint pain, chest pain, dizziness or who suffered angina pectoris, and (4) people with uncontrolled blood pressure (greater than 160/100)[11].

The participants were individually tested in face-to-face sessions by field team members trained in the application of the COGTEL, MMSE and the socioeconomic questionnaire.

This research followed the ethical principles contained in Resolution No. 466/12 of the National Health Council of the Ministry of Health of Brazil and was approved by the Ethics Committee for Research Involving Human Beings of Amazonas State University, Consubstantiated Approval No. 1,599,258 - CAAE:56519616.6.0000.5016. The project was also presented and approved by the Scientific Commission of the Department of Sport and Physical Education, of the School of Social Sciences of the University of Madeira, Portugal. Participation was voluntary and participants were recruited through direct contact by the team of researchers responsible for the study. All the participants signed a free and informed consent form (FICF).

Mini Mental State Exam (MMSE)

The Mini Mental State Examination (MMSE)[1] was used to assess mental status. This questionnaire allows a summary evaluation of cognitive functions. The test consists of five subsections covering orientation (0-10 points), immediate and recent memory (0-3 points each), attention capacity and counting backwards calculation (0-5 points), language and constructive capacity (0-9 points). A total score is derived from the sum of the scores of the five subsections.

Level of schooling

Level of schooling was estimated from the socioeconomic questionnaire of the Brazilian Association of Research Companies (ABEP)[12]. To this end, participants were asked about their level of schooling. The following scores were considered for this purpose: 0 = Illiterate/Incomplete primary; 1 = Complete primary/Incomplete junior high; 2 = Complete junior high/Incomplete secondary; 3 = Complete secondary/incomplete higher; 4 = Complete higher.

Cognitive Telephone Screening Instrument (COGTEL)

COGTEL, originally constructed with the dual purpose of being applied by telephone and in face-to-face interviews, is composed of six subtests that cover important domains of cognitive functioning. All the procedures related to the application of COGTEL can be consulted in detail in an earlier publication by the authors of the instrument, Kliegel et al.[3].

COGTEL comprises 6 subtests: (1) Prospective Memory; (2) Short Term Verbal Memory; (3) Working Memory; (4) Inductive reasoning; (5) Verbal Fluency and (6) Long Term Verbal Memory.

Prospective Memory: Prospective memory is evaluated using the "event-based task" system. In this test, the task of executing the intended action is triggered by the presentation of specific external information. At the beginning of the questionnaire, the participants were instructed to say their date of birth without being asked for it at a certain point during the questionnaire. The prospective memory score was 1 if the participant correctly stated their date of birth at the right time. Otherwise, the score was 0.

Short-Term Verbal Memory: In this subtest, eight pairs of words are given to the participants (four or which are semantically related and the remainder of which are unconnected). After giving an example, the field team member reads aloud all the pairs, which the participants memorize. The short-term Verbal Memory score is the number of words correctly associated with the pairs (min = 0; max = 8).

Working Memory: Working Memory is evaluated using the backward digit-span test (saying a sequence of numbers from back to front). Participants hear the sequence of numbers and immediately repeat what they have heard in reverse order. The Working Memory score is the total number of correctly reproduced sequences (min = 0; max = 12).

Inductive Reasoning: In Inductive Reasoning, the member of the field team presents the participants with a sequence of five numbers constructed according to a mathematical rule between each of them. The participants must add the final number to the sequence in order to complete it. The inductive reasoning score is the total number of correct sequences (min = 0; max = 8).

Verbal Fluency: Verbal Fluency (executive functioning) is assessed using two tests: (1) Letter Fluency - participants are instructed to produce words that begin with the letter "A" for 60 seconds; and (2) Category Fluency - participants are instructed to state all the different types of profession they can think of in 60 seconds. The total verbal fluency score is the sum of the "letter fluency" test score + the "category fluency" test score.

Long-Term Verbal Memory: Long-Term Verbal Memory is evaluated in the same way as Short-Term Verbal Memory, using the same word pairs. The Long-Term Verbal Memory score is the number of words correctly associated with the pairs (min = 0, max = 8).

The total COGTEL score is derived from the sum of the scores of each of the six subtests, weighted accordingly, using the following formula: Total COGTEL score = 7.2 x prospective memory + 1.0 x short-term verbal memory + 0.9 × long-term verbal memory + 0.8 x working memory + 0.2 x verbal fluency + 1.7 x inductive reasoning.

COGTEL translation and retranslation procedure

The COGTEL translation team consisted of a committee of five researchers, including the lead author of the instrument (Matthias Kliegel; MK) who published the first English version in 2007 (Kliegel et al.)[3]. Initially, each subtest of the instrument was discussed with its author and the translation from English to Portuguese was performed by a native speaker. Later, the same procedure was carried out from French to Portuguese by a Portuguese-descended researcher, as COGTEL has also been translated into French. In both cases, each final version was back-translated and a final revision of both back-translation versions was made.

The translation, synthesis and back-translation procedures were carried out without difficulties and the modifications of the committee were aimed at

guaranteeing the semantic, idiomatic, cultural and conceptual equivalence of the translated instrument with the original instrument. Finally, the instrument was tested in the community with different age groups (young people, young adults, adults and elderly adults). The purpose of the application of COGTEL in this preliminary phase was to simulate the application of the instrument in a real field context, to calculate application times and gather information relating to the degree of difficulty of the instrument. Prior to the pilot study, the committee reconvened and the version was again submitted for review and adjustment by the author of the instrument (MK), until it was considered ready.

Statistical Analysis

Descriptive statistics (mean and standard deviation) were used to describe the characteristics of the sample. The reliability/stability and concurrent validity of the COGTEL was assessed as follows: first, the test-retest reliability of the total COGTEL score (as well as the six subtests separately) was assessed among 90 elderly adults from the three regions of Amazonas studied using an intraclass correlation coefficient. Next, concurrent validity was evaluated by analyzing the relationship between total COGTEL score and total MMSE score using bivariate correlations (Pearson correlation coefficient). Finally, using the same procedure, the relationship between the total COGTEL score and level of schooling (number of years of schooling) was assessed.

The level of significance was set at $p<0.05$. Analysis was performed using the SPSS statistical program, version 23.0.

RESULTS

Test-retest reliability

The intraclass correlation coefficient (R) and the confidence interval (CI 95%) between the total test and retest COGTEL scores (and the scores of the six subtests), the MMSE scores and levels of schooling are shown in Table 1. A high test-retest reliability was found for the total COGTEL score (R=0.946). In the case of the six COGTEL subtests, reliability ranged from acceptable to high (Table 1). High reliability was also found for total MMSE score, as well as level of schooling, R=0.899 and R=0.985, respectively.

Table 1. Test and retest intraclass correlation coefficient (R) and confidence interval (CI 95%) for total COGTEL score (and its six subtests), MMSE and level of schooling. Manaus, Fonte Boa, Apuí - AM, 2016.

Variables	n	Test Mean (±sd)	Retest Mean (±sd)	R*	95% CI**
Prospective Memory	85	0.1(±0.4)	0.2(±0.4)	0.708	0.550 – 0.810
Short-term verbal memory	90	3.2(±1.5)	4.1(±2.1)	0.777	0.662 - 0.853
Working memory	90	2.8(±1.9)	3.0(±2.1)	0.873	0.808 - 0.916
Verbal fluency	90	13.2(±8.4)	14.4(±8.8)	0.938	0.906 - 0.959
Inductive reasoning	90	1.0(±1.2)	1.1(±1.3)	0.807	0.707 - 0.873
Long-term verbal memory	90	3.7(±1.9)	4.5(±2.2)	0.882	0.821 - 0.923
Total COGTEL *** Score	90	24.1(±12.4)	27.3(±14.3)	0.946	0.919 - 0.965
Total MMSE **** Score	90	23.8(±4.5)	24.4(±4.0)	0.899	0.847 - 0.934
Level of schooling	90	0.8(±1.4)	0.8(±1.4)	0.985	0.977 - 0.990

*Intraclass correlation coefficient; **Confidence interval; ***_Cognitive Telephone Screening Instrument_;****Mini Mental State Exam.

Concurrent validity

The relationship between the total COGTEL score (as well as for each of the six subtests) and MMSE and level of schooling was investigated using the Pearson correlation coefficient. Preliminary analyzes were carried out to ensure assumptions of normality, linearity and homoscedasticity. There was a positive correlation between total COGTEL score and MMSE (r=0.682, p<0.001), as well as level of schooling (r=0.604, p<0.001). The correlations in the remaining cognitive function subtests and MMSE ranged from weak for prospective memory (r=0.237; p<0.05) to strong for working memory (r=0.655; p<0.001) (Table 2).

Table 2. Bivariate correlations between total COGTEL score (as well as the six subtests) and total MMSE score and level of schooling. Manaus, Fonte Boa, Apuí - AM, 2016.

Variable	MMSE*	p	Level of schooling	p
Prospective Memory	0.237**	0.025	0.162	0.128
Short-term verbal memory	0.501**	<0.001	0.456**	<0.001
Working memory	0.659**	<0.001	0.592**	<0.001
Verbal fluency	0.655**	<0.001	0.622**	<0.001
Inductive reasoning	0.584**	<0.001	0.559**	<0.001
Long-term verbal memory	0.561**	<0.001	0.455**	<0.001
Total COGTEL *** Score	0.682**	<0.001	0.604**	<0.001

*Mini Mental State Exam ** Pearson (sig. 2-tailed) correlation coefficient; ***Cognitive Telephone Screening Instrument.

DISCUSSION

The present study sought to evaluate the reliability and concurrent validity of the COGTEL instrument in a pilot study with 90 elderly adults from the Amazon region. Test-retest reliability was high for the total COGTEL score and acceptable-to-high for the remaining six subtests of the instrument. Similar test-results were found for MMSE score and level of schooling. The intraclass correlation coefficient is the most commonly used measure to study the stability of the scores in the two tests[13].

The reliability values reported in our pilot study are comparable to those found for other scales. For example, on the Wechsler scale (intelligence assessment), reliabilities ranging from 0.38 to 0.87 were found for young adults and adult-adults[14,15]. When considering the reliability measures of by the MMSE[16], meanwhile, the values generally range between 0.80 and 0.95. The test-retest reliability reported in the present pilot study for the MMSE and the level of schooling was equally high, at 0.899 and 0.985, respectively.

These results indicate that COGTEL (as well as its subtests), the MMSE and level of schooling (evaluated from the socioeconomic questionnaire proposed for the Brazilian population) have an acceptable degree of reliability/stability, taking into account the points mentioned by Thomas and Nelson[13]. This means that these tests can be reliably used for assessing cognitive functioning and level of schooling in elderly persons. These results are in agreement with a recent study published in Dementia and Geriatric Cognitive Disorders Extra by the research team that translated and developed the COGTEL for the Portuguese language, Ihle et al.[4]. COGTEL is thus proposed as a quick and reliable assessment tool for cognitive functions, which can be used in epidemiological studies with elderly adults.

The present study also found a strong positive correlation between total COGTEL score and MMSE score, as well as level of schooling. Concurrent validity involves a measuring instrument and an evaluation criterion administered at the same time[13]. In the present study, MMSE was considered as a popular criterion measure, validated and widely

accepted for the evaluation of cognition, particularly in elderly adults, and COGTEL was the instrument to be validated for this population. Ihle et al.[4], in a Brazilian sample of 361 elderly men and 507 elderly women living in the community, with a mean age of 70.1 (± 6.8) and a variation of 57-92 years, established the correlations between COGTEL and MMSE. A substantial correlation was found between total COGTEL and MMSE score ($r = 0.65$, $p < 0.001$). These results are very similar to those found in the present pilot study ($r = 0.68$, $p < 0.001$).

Kliegel et al.[3], when evaluating the simultaneous validity of the COGTEL instrument, calculated the Pearson correlations between total COGTEL score and level of schooling. Higher total COGTEL score values were associated with more schooling, r=0.47. The results of the present pilot study support the results of the authors of the COGTEL, Kliegel et al.[3], obtaining even higher correlation values (r=0.60).

As previously suggested by Kliegel et al.[3], in the present study the concurrent validation of COGTEL was performed by comparing the results of this instrument with those of other cognitive evaluation instruments, such as the MMSE. As described in literature, Creavin et al.[2] corroborates the finding that MMSE is one of the most used tests, both in epidemiological studies and in the context of clinical practice, mainly due to its established validity, as well as its quick and easy application. We are, therefore, dealing with an appropriate criterion. Since there was a strong positive correlation between total COGTEL score and the MMSE ($r=0.682$; $p < 0.001$), we can say that there is concurrent validity in these instruments.

In contrast, the application of the COGTEL instrument presents some advantages over the MMSE in the evaluation of cognition. Firstly, in the quantification of total COGTEL score, six subtests are considered (prospective memory, short-term verbal memory, working memory, inductive reasoning, verbal fluency and long-term verbal memory) with different weightings in the final COGTEL equation. In the case of the MMSE, all the tasks have the same weighting in the final calculations. Secondly, the MMSE has exhibited limitations in studies in individuals living in the community with healthy cognitive functioning aging. This means that the MMSE is not sensitive enough to differentiate individual performance levels, as it is restricted by its ceiling effect[3,4]. In other words, it does not allow the monitoring of interindividual differences in cognitive functioning in individuals who have already reached the total score of the scale[5,6].

In addition, in order to study concurrent validation, we have supported our findings with previous studies[16,17,3] in which the associations between the tests of cognitive functions and level of schooling were calculated. This conceptual framework is based on the assumption that schooling, usually defined as the number of years of formal study completed, has proven to be an important determinant of cognitive performance[8]. Therefore, there is some unanimity in the idea that intellectual capacity and schooling contribute to the development of cognitive reserve, behind which lies an ability to attenuate the effects of neural impairment on the cognitive abilities resulting from the aging process[2,18,19]. These results support the use of COGTEL as a valid instrument for assessing cognitive function, which can be used in epidemiological studies with elderly adults residing in the community.

The present study, however, presents some limitations that must be considered when interpreting the results. Firstly, the participants were essentially voluntary, and therefore, may be generally healthier than those who did not participate. Second, survival bias, especially among men in older age groups, can not be ruled out as a potential confounding factor, particularly in comparisons between genders. Finally, although cases of severe hearing loss were identified, small auditory deficits were not totally controlled, which may have led to difficulties in understanding the tasks to be performed by the elderly.

CONCLUSION

The present study presents preliminary evidence of the reliability/stability and the concurrent validity of COGTEL in the evaluation of cognitive functions in elderly adults living in the community. The results of the present study support the use of COGTEL as a quick, reliable and valid instrument to analyze interindividual differences in cognitive functioning in studies with elderly adults.

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Changes in quality of life: the experience of elderly persons at a university of the third age

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Abstract

Objectives: The aim of the present qualitative and quantitative study was to investigate whether the participation of elderly persons in the University of the Third Age (U3A) of the Federal University of São Paulo, Baixada Santista (Unifesp/BS) led to a perceived improvement in quality of life; the meaning of the term quality of life for the participants; and whether education and social interaction are considered relevant in any such perceived improvement. *Method*: Data were collected through the SF-36 questionnaire and semi-structured interviews at the beginning and end of the academic year. *Results:* The quantitative data did not differ significantly between the beginning and end of the research period, except for the variable Vitality (V). The qualitative results, however, signaled a perception of change in terms of education, social interaction and quality of life. *Conclusion:* The data indicated that participation in the University of the Third Age at the Federal University of São Paulo, Baixada Santista (Unifesp/BS) was associated with a perception of positive changes in the quality of life of the elderly persons, who considered social interaction and education to be an important part of these improvements.

Keywords: Elderly. Education. Social Interaction. Quality of Life. University of the Third Age.

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INTRODUCTION

Aging and quality of life

Aging can be interpreted as a process of various dimensions which encompasses changes dependent on biological, psychological and socio-historical factors. It includes aspects particular to each individual, such as genetics and everyday habits; and that are common to a certain group, such as socioeconomic and cultural factors[1-3]. It should be emphasized, however, that this changing stage of life involves not only physical and emotional decline, but also opens the door to new explorations and experiences[2,4].

According to the Global AgeWatch[5] international organization 18.8% of the population of Brazil will be over 60 years old by 2030, while by 2050 this percentage will reach 30%, meaning that the total number of elderly people aged over 80 years will be greater than the number of children under four[6]. This significant increase in the elderly population presents new challenges for society and its institutions, such as the creation and expansion of public policies to improve the quality of life of the elderly and allow them to break the paradigm of unproductiveness and dependence to enjoy a dignified and participatory old age[7-9].

Quality of life, a subjective concept, has been defined as a phenomenon of multiple perspectives. In old age it is related to a fair socioeconomic situation and the protection of the family, the maintenance of intellectual activity, and the ability to adapt to physical, social and emotional losses. In short, it is related to the appreciation of the favorable aspects of life[2,8,10]. In this sense, social interaction, leisure and education are important dimensions of maintaining the quality of life of the elderly[8,11].

Education and social interaction in the third age

The concept of permanent education suggested by the United Nations Educational, Scientific and Cultural Organization (UNESCO) is based around a dynamic system in which the construction and appropriation of knowledge occur throughout life, at a constant pace[12,13]. The participation of the elderly in the educational process represents a preponderant factor for their quality of life, through which they can remain integrated within an evolving society, develop their critical sense and be recognized as agents of their own history[13,14] . The educational activities in the third age which are provided by Universities of the Third Age (U3A) must therefore meet the specificities of this age group, valuing their life histories and involvement, their broader social relations and relevant new learning[9,13-15].

Partnerships between the U3As, educational institutions and qualified professionals contribute to the reduction of stereotypes and help create new social interpretations[2,16] encouraging so-called active aging[2,17]. This new paradigm requires changes that emphasize respect for the elderly and their ability to contribute to society in this stage of life as much as any other, helping to solidify a new perception of aging, which will be fully accomplished when public policies of valorization and support become a reality[2,9,17].

The benefits of intergenerational relationships in the third age should be emphasized[2], as the interaction between the young and old in education programs encourages new perceptions and the renewal of expectations regarding the future[2,18]. Social groups such as U3As are therefore consecrated as an environment of integration in which education can be reaffirmed through new learnings and exchanges[12], helping the elderly to improve their physical and mental quality of life, making them aware of the importance of self-care and self-worth, increasing their motivation and self-esteem and renewing their sense of citizenship[2,4].

The U3As and the U3A UNIFESP/BS

The first U3A was created by Pierre Vellas in France in the early 1970s to promote interaction among the elderly[13]. In Brazil, however, the first incursion into elderly education was developed by the Social Service of Commerce of São Paulo (SESC) in the 1960s. Since then, U3As have become more accessible and popular, supporting the development of the physical mental health and social life of the elderly through the pedagogical dynamics of the universities. The majority of the U3A programs in Brazil aim to promote reflections on aging and its

biopsychosocial developments, helping to overcome old-age-related prejudice and stigma[12-19].

A study of U3As in Brazilian federal universities[20] has found that many offer such spaces in which the elderly can participate. Of the total surveyed, 36 maintain U3As that offer courses and activities for the elderly, study centers linked to extension and research, projects and programs aimed at this age group or some kind of partnership with foundations, associations, states and municipalities. Three such programs, such as Unifesp/BS, allow the elderly to attend some undergraduate classes. The teachers are, for the most part, university professors and employees who work on a voluntary basis. These universities, depending on their location and characteristics, offer courses, lectures, workshops and leisure activities to participants[20–22].

The present study aimed to identify if the participation of the elderly at Unifesp/BS promotes a perception of improvement in their quality of life; characterize this concept from the perspective of the participants; and verify if education and social interaction were relevant aspects of this perception. The research is important as the results of the study can encourage the participation of a greater number of elderly persons in academic and extension activities, as is the case with the University of the Third Age of the Universidade Federal de São Paulo-Baixada Santista (Unifesp/BS).

METHOD

A qualitative and quantitative descriptive and exploratory study was carried out. The participants were students from the two units of the U3A-Unifesp/BS, (Silva Jardim and Zona Noroeste). Each group comprised 50 students, who were predominantly female (93%), and lived in Santos, São Paulo.

The names of all the U3A-Unifesp/BS participants were listed in alphabetical order, and a randomized selection of the elderly was performed using the BR.Calc program, which allocated random numbers to the 50 names listed. This process was repeated until the expected number of participants was reached, which was ten for each group, based on a sample calculation performed considering the mean variable of the SF-36[23] instrument, an estimated standard deviation of 15, a difference to be found of 22, a level of significance of 5% and a test power of 90% for comparison between means. The following inclusion criteria were established: age between 65 and 90 years old; participate in one of the groups of the U3A-Unifesp/BS and respond to interviews and questionnaires at the beginning and end of the academic year, hereby indicated by (I) and (II). Participants who did not meet these criteria were excluded, along with those who participated in other social groups after the beginning of U3A-Unifesp/BS activities.

The participants were contacted and interviews were individually scheduled with those who agreed to take part in the study, respecting pre-established ethical aspects and subject to the signing of a Term of Free and Informed Consent. All the interviews were carried out and recorded by the researcher in one of the rooms of the institution.

In order to obtain the quantitative data, the Brazilian version of the SF-36 Quality of Life Questionnaire (SF-36)[23], translated, adapted and validated in Brazil by Ciconelli et al.[23], was applied at the beginning and end of the academic year of the U3A-Unifesp/BS. This is a generic questionnaire that aims to measure the perception of quality of life of the elderly through items, divided into eight domains: physical functioning, role limitations (physical), bodily pain, general health, vitality, social functioning, role limitations (emotional) and mental health. Its score ranges from zero to one hundred points, so that the higher the score, the better the perception of the quality of life of the interviewee.

The quantitative data were entered in an Excel spreadsheet for description, calculation of mean and standard deviation of the different variables. After confirming the absence of normality of data according to the D'Agostino-Pearson Test, the Wilcoxon Comparison Test was performed for the dependent samples, between the start and end of the academic year, and the Mann Whitney test for independent samples between groups was applied with a significance level of 5%, $p \leq 0.05$. These analyzes were performed using the S GraphPad Prism7 software.

In addition to the SF-36[23], the Socio-Economic Questionnaire of the Brazilian Association of Market

Research (ABIPEME)[24] was applied to classify the groups of participants. This instrument uses schooling and the possession of consumer goods to socioeconomically categorize a population.

For the qualitative analysis, semi-structured interviews guided by a script were recorded before the SF-36[23] questionnaire was applied, at the beginning and at the end of the academic year. The questions asked about the decision to join the U3A– Unifesp/BS; expectations regarding participation and opinions about the activities proposed during the lessons. The elderly participants were asked to conceptualize the term "quality of life", evaluate it and report on the aspects that influenced it.

Following this stage the interviews were transcribed and analyzed using the Content Analysis/thematic analysis technique[25]. The study was approved by the Research Ethics Committee of the Federal University of São Paulo - approval nº. 936.239 and observed all the directives indicated by this body.

RESULTS AND DISCUSSION

Initially, of the 20 names drawn, 16 women and two men responded to the research instruments (ten from the Silva Jardim group and eight from the Zona Noroeste group), and are hereby referred to as E1 to E18. In the second interview, however, two participants were excluded as they had joined other social groups and two withdrew from the study. To homogenize the sample group, another man was excluded as the sample size was not representative of the total sample. The final sample of this study was therefore composed of thirteen women: (n=7) in the Silva Jardim (SJ group) with a mean age of 74.86 (± 3.34) years and a socioeconomic classification categorized as B, and (n=6) in the Zona Noroeste group (ZN group), with a mean age of 74.86 (± 3.34) years and a socioeconomic classification of C.

The results regarding the perception of quality of life obtained by the SF36[23] instrument are shown in Table 1, below:

Table 1. Perception of the Quality of Life (SF-36[23]) of elderly women attending the University of the Third Age. Santos, SP, Brazil, 2016.

Variables	Total sample (N=13)	SJ group (n=7)	ZN group (n= 6)
Physical functioning	70.00 (± 17.56)	70.71 (± 18.80)	69.17 (± 17.72)
Physical functioning 2	71.54 (± 19.41)	80.00 (± 13.23)	61.67 (± 21.83)
Role limitations (physical)	71.15 (± 41.89)	71.43 (41.90)	70.83 (± 45.87)
Role limitations (physical) 2	69.23 (± 44.67)	78.57 (± 30.37)	66.67 (± 51.64)
Bodily pain	67.08 (± 20.43)	70.57 (± 17.79)	63.00 (± 24.19)
Bodily pain 2	66.54 (± 19.70)	70.14 (± 23.55)	62.33 (± 15.03)
General health perceptions	65.15 (± 17.18)	65.57 (± 14.35)	64.67 (± 21.47)
General health perceptions 2	63.15 (± 23.57)	67.86 (± 15.77)	62.33 (± 31.86)
Energy/Vitality	63.08 (± 19.64)	53.57 (± 15.20)	+74.17 (±19.34)
Energy/Vitality 2	72.69*****(± 21.85)	70.00***** (± 15.81)	75.83 (± 28.71)
Social functioning	80.77 (± 18.83)	76.79 (± 18.30)	85.42 (± 20.03)
Social functioning 2	82.37 (± 24.34)	76.79 (± 22.16)	88.89 (± 27.22)
Role limitations (emotional)	76.92 (± 39.40)	71.43 (± 40.50)	83.33 (± 40.82)
Role limitations (emotional) 2	79.49 (± 34.80)	71.43 (± 71.43)	88.89 (± 27.22)
Mental health	77.23 (± 17.16)	68.57 (± 16.40)	87.33 (± 12.50)
Mental health 2	80.31 (± 15.53)	77.14 (± 15.09)	84.00 (± 16.59)
Mean	71.42 (± 17.76)	68.58 (± 15.75)	74.74 (± 20.86)
Mean 2	73.43 (± 18.20)	73.99 (± 16.31)	73.83 (± 24.34)

The number 2 next to the variables of the SF-36[23] refers to the results at the end of the academic year. Significance: $p = \leq 0.05$ represented by (*) for comparison between moments, and (+) for comparison between groups. Total score: $*p = 0.044$ between initial and end of academic year for Vitality. Group SJ: $*p = 0.009$ between initial and end of academic year for Vitality $+p = 0.049$ comparing values between groups.

The quantitative results suggested that there were no significant difference between the initial and final data for the results of the SF-36[23] questionnaire in the Zona Noroeste group. In the Silva Jardim group, no relevant variations were recorded other than for Vitality (V), the value of which increased significantly between the initial and final moments (p = 0.009) and between groups (p = 0.049). The same was observed in the total sample, indicating that the increase in Vitality (V) in the Silva Jardim group affected the variation of these data. Comparing Vitality values (V) for both groups and considering a previous study by Bittar et al.[26] [n = 53; average age 67.90 (± 6.11)], whose initial values for this aspect [68.56 (± 23.18)] were similar to the Zona Noroeste group [74.17 (± 19.34); mean age 67.83 (± 1.17)], it could be inferred that the initial value for Vitality (V) in the Silva Jardim group [53.57 (± 15.20)] was lower than expected before the beginning of U3A-Unifesp/BS activities, although the mean age of the participants was higher [74.86 (± 3.34)].

Almeida et al.[27] also obtained positive results in all domains of the SF-36[23] in a comparative test between a group of elderly participants of a social group (G1) and a control group (G2). The differences between the groups were statistically significant, especially for the variables physical functioning (p=0.000), overall health perception (p=0.004), vitality (p=0.014), social functioning (p=0.005) and mental health (p=0.035).

The qualitative results, on the other hand, revealed that the interviewees considered their experience at the U3A-Unifesp/BS as notably beneficial. Content analysis of the interviews identified nuclei of meanings, later synthesized into themes, which are described below.

The interviews were about the decision to attend U3A- Unifesp/BS; expectations regarding participation, and opinions of the proposed activities. The elderly were asked to conceptualize the term "quality of life" and evaluate and report on aspects that influenced it. The answers revealed that most were encouraged to attend U3A-Unifesp/BS by relatives or friends; their expectations were related to socializing or occupying their free time, while the vast majority of the proposed pedagogical activities aroused their interest and curiosity both in the classroom and daily life.

> "I saw that we were going to talk about water and I thought that's interesting. It's something I'm going to have to use in the class project. So I started, I spent Sunday watching Cultura TV, talking about water, about the planet. So it's things that are interesting, that alter our lives and yet do not arouse our interest. Then U3A and the project opened my mind, which had been limited to recipes and the TV news. You begin to give importance to things that had previously gone unnoticed in your life" (I) (E7).

In the first interviews the participants related quality of life to health and happiness, satisfying basic needs and interacting with family and friends. In the second interviews more detailed elements were added and other dimensions were described, such as enjoying physical and emotional health; having access to good food and decent housing; participating in cultural and leisure activities; carrying out benevolent actions, having autonomy and peace of mind, as well as maintaining good family relations. This reaffirms that such formulation is conceived in a subjective and varied manner, which takes into account determinant factors such as health, emotional well-being, family, sociability, motor and intellectual functions, family relationships, satisfaction with life, self-care and spirituality[3,28,29].

> "Quality of life is to be healthy, right? Enjoying a certain comfort, living somewhere practical, being able to move around, right? But the main thing is health!" (I) (E2).

> "Quality of life? It's if an elderly person is able to take part in activities, to go out, to go to the movies, to be able to go to the movies, to the theater, which, by the way, I like very much!" (II) (E13).

When evaluating their quality of life, some of the participants of the Silva Jardim group displayed dissatisfaction in the first interviews. At the end of the academic year, however, both groups assessed their quality of life as good or great.

> "Currently? Oh it's great! Yeah, I go out. I go for a walk. I have fun. I go out when I want to. I come back when I want, so... (laughs)" (II) (E1).

> "I think my quality of life is good! First of all I do a lot of physical exercise, I care about what I eat too, right? And I try to get on with other people" (II) (E16).

Regarding influences on quality of life, at the beginning of the academic year, elements related to work, family and children were mentioned. At the end of the year, however, these multiplied and others were added, such as marital status, health, family, children, functional capacity and autonomy, self-image, social interactions, and romantic relationships.

> "What do I think has the most influence? The love my children have for me" (II) (E4).

> "In my quality of life, it was the U3A and him (her boyfriend). That's what I said in an interview that we had there. No! in a description of the U3A, and at the end I said yeah, that God ... that I was very happy! That I [...] I already missed the U3A because it gave him to me... this year of college and it gave me the person who is making me so happy, because it happened at the U3A" (II) (E1).

The participation of the elderly in educational activities has been related to positive consequences, such as the reduction of psychosomatic diseases[12-19], the increase of cognitive reserve[12,30] and the consequent improvement in quality of life[12]. In the same context, it was found that participation in the U3A-Unifesp/BS made it possible to review what the participants had studied in their youth, to acquire new knowledge, to express one's own ideas, to listen and to be heard, and to put into practice the acquired learning, in an exercise of what is conventionally called lifelong education[12,15,19,30].

> "I didn't recycle. So with the lessons I'm having, the class project [...], with the work we're doing about the environment, I now separate everything. You can't mix your recyclables! I'm using it, right? And I took it more like this: Gee, I'm wrong, right?" (II) (E2).

Although the term education was not mentioned in the interviews, the use of similar terms: learning, to learn and knowledge, allied to the benefits of taking part in the U3A-Unifesp/BS were repeatedly observed showing that the elderly recognize the relevance of education to quality of life.

> "I didn't like computers and yet I was able to learn, within what I wanted to study! To look for a recipe, handicrafts, I'm already managing it" (II) (E8).

The elderly participants also emphasized, on several occasions, the importance of social interaction in their quality of life[2,12] both in terms of the expectations they described at the beginning and end of the academic year. Participation in the U3A- Unifesp/BS seems to have provided the elderly with social support, providing them with new opportunities for interaction, the maintenance of cognitive health and greater autonomy[12, 30,31].

> "I had a health problem, I had to miss classes at the time, when I came back, I had a feeling, you know? That everyone noticed my absence and that I was valued, right? I felt valued because they'd noticed I wasn't there" (II) (E7).

As for Vitality (V), the meanings provided seemed to be associated with the questions proposed by the SF-36[23]. *Do you feel full of pep? Do you have a lot of energy? Do you feel worn out? Do you feel tired?* Drawing a parallel between the Vitality (V) domain and the quality of life assessments in the interviews at the beginning of the academic year, the quality of life evaluation of the Zona Noroeste group was already predominantly positive and by the end it had undergone very few changes. In the Silva Jardim group, the assessment of quality of life at the beginning of the academic year displayed a variety of evaluations. By the end of the year, however, it was predominantly positive, depicting a shift similar to that of the Vitality domain (V/V2) in this group. Relevant changes in health conditions were not mentioned, and non-U3A- Unifesp/BS associations that could explain this change were excluded, such as adopting new physical activities or new social engagements, which often contribute to the maintenance of physical and mental well-being in old age and help to keep loneliness and depression at bay[12,27,32].

> "Discouragement, depression, disbelief [...] I did not believe my husband had died. And once I came to the U3A, I got better again. I came back to life!" (II) (E11).

Another aspect is the socioeconomic classification, identified by the application of the socioeconomic questionnaire[24]. The Silva Jardim group was categorized as B, while the Zona Noroeste group as C (60.57 ±10.41x 46.20 ±8.29 p=0.015). The total sample was also categorized as class C (57.17 ±10.01). Regarding social class, it can be suggested that a lower socioeconomic status does not necessarily imply a worse perception of domains related to aspects of quality of life and vice-versa, as it is impossible to restrict this concept to a single element, and several factors can contribute to a better or worse quality of life [33].

The fact that the group characterized as class C evaluated their quality of life as predominantly positive from the beginning of the academic year, in contrast to the group characterized as class B, can be interpreted by a series of factors, among which are the need to manage daily problems without the help of others; a more frequent interrelationship with younger members of the family, who depend on the help of the elderly person for everyday situations, and finally the social condition itself, which may favor valuing events considered insignificant by financially more fortunate individuals.

Besides pointing out the importance of interacting socially and making new friends[2,12] the interviewees reported that they felt capable and well-received. One pointed out the fact that she did not suffer any form of discrimination.

> "The affection, the affection the teachers displayed towards us, without any differences... in social status or class or race. When I came here, through the invitation of a friend, I felt good, I was welcomed; and I believe I didn't, I had no difficulty, none. Especially because I felt inferior to people due to my social standard, you know? And I felt very happy, because there weren't any differences here. None!" (I) (E5).

It should be emphasized that reports of this nature indicate individuals victimized by the prejudice associated with their socioeconomic status and by the notion that public policies are the result of favors and charitable attitudes, rather than legitimate rights. It is impossible to think about quality of life without considering the inherent aspects of survival, such as low income, precarious housing and lack of food, among others factors that frequently cause discouragement and indignity[3,9].

Participation in the U3A-Unifesp/BS seems to have encouraged considerations on the elements that affect personal satisfaction and consequently quality of life[3,12,27]. At the end of the academic year, the reports of the interviewees did not merely describe the minimum or the general aspects of the concept, but were incisive and detailed, and referred to other significant components. The testimonies, in spite of the difficulties inherent to age and social conditions and taking into consideration the significant experiences and histories of the interviewees, support the qualitative data of this study, which suggests that participation in U3A-Unifesp/BS improved the quality of life of participants[2,12,27]. Additionally, the interviewees also described education and especially social interaction as the most relevant elements:

> "And interacting with other people as well. You can't just stay home alone. That is very bad. I think it isn't quality of life. Because the moment you get lonely, you don't talk to anyone. Or you shrink inside yourself. So interacting with other people is very important. I think that human beings aren't supposed to live alone" (II) (E16).

In the present study qualitative and quantitative approaches were adopted to provide a more comprehensive picture of the perceptions of elderly persons attending the groups of the U3A-Unifesp/BS. Neither approach was found to be better or more correct, nor was there direct opposition among the presupposed subjectivity and objectivity in the two methodologies[34]. However, the prevalence of one of the types of research and the deficiencies of both are commonly observed, while their interweaving provides a broader and deeper insight into the subject of this study[35].

In this context, it is necessary to mention the limitations of this research, namely the absence of a control group for data comparison, as the study was carried out entirely in the Baixada Santista *campus*. It should also be remembered that the fact that some elderly persons left the study, as was their right in

accordance with the Free and Informed Consent Form, contributed to a reduction in the previously established number of participants, which became a limitation for other inferences of the quantitative analyzes.

CONCLUSION

The results obtained by the quantitative and qualitative instruments in the present study produced complementary data. The interviews revealed a perception of improvement in the quality of life of the participants, even though no changes were observed in most of the areas investigated by the SF-36. It seems that the evaluation of improvement in the quality of life of the participants was not due to the sum of the aspects in the quantitative instrument, but to one aspect in particular, namely vitality. From a qualitative point of view, education and social interaction were also emphasized, and an association between the results of the two instruments is therefore suggested.

The present study sought to draw a parallel between the insertion of the elderly in the two groups of the University of the Third Age- Unifesp/BS and the perception of changes in their quality of life based on their testimonies and evaluations. The elderly characterized their quality of life as having changed positively. It can therefore be affirmed that the University of the Third Age at the Federal University of São Paulo, Baixada Santista encouraged the perception of changes in the quality of life of the participants in the groups.

The results of the study emphasize the importance of creating public policies aimed at implementing other initiatives such as Universities of the Third Age, to improve the quality of life of the elderly by fostering social interaction and continuous learning and helping leverage self-esteem, inclusion and new life goals.

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Factors associated with temporomandibular dysfunction in the elderly: an integrative literature review

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Abstract

Objective: To identify the factors associated with temporomandibular dysfunction among elderly persons. *Method:* An integrative literature review was carried out, evaluated by scientific publications indexed in five databases: MEDLINE/PubMed, SCOPUS, WEB OF SCIENCE, CINAHL and LILACS, without date or language restrictions. The adapted Newcastle-Ottawa Scale was used to evaluate the articles. *Results:* Of the 888 articles from the databases, four were considered eligible for this review. Risk of bias analysis classified one article as low risk and the other as intermediate risk. *Conclusion:* The factors associated with temporomandibular dysfunction in the elderly indicated by the studies were: female gender, age between 60-70 years, a low income, suffering from tinnitus, dizziness, depression, headache or bruxism; experience temporomandibular joint palpation, masticatory and cervical muscle pain, a low number of teeth and the use of complete dentures.

Keywords:
Temporomandibular Joint Disorders. Elderly. Aged, 80 and Over.

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INTRODUCTION

The population segment aged 60 years and older is growing rapidly in relation to other age groups, with some 962 million people aged 60 or above, representing 13% of the total population. According to World Population Prospects: 2017 Revision, the global population reached almost 7.6 billion by the middle of 2017, and the number of elderly people in the world is projected to be 1.4 billion by 2030, 2.1 billion in 2050, and 3.1 billion in 2100[1]. Unlike the other regions of the world, Africa is in the early stages of demographic transition and has high fertility rates, with its population structure made up of more young people. Less than 5% of the total population of the vast majority of African countries is aged 65 and above, and in 21 countries this group represents 3% of the population or less, including Ethiopia (2.9%) and Uganda (2%)[2].

Although aging is a natural process, changes in the human body due to advancing age involve systemic, physiological and/or anatomical characteristics and influence the presence or absence of diseases. Health-related factors also emerge from the lifestyle of each individual and play an important role in planning care for such individuals[3].

The limitations found in aging occur, on average, in the group aged between 50 and 60 years, at which point the decline of functional motor units begins, combined with atrophy of the body tissues. Functional alterations also involve the oral cavity region, which presents disorders such as loss of mucosal elasticity and changes in the underlying and supporting tissues, muscular and bone structures. In this region there is an increase in the connective and adipose tissue in the tongue, a reduction in the number of teeth, as well as gustatory limitations and a reduction in taste, leading to a decline in the quality of life of the elderly[4-6].

Temporomandibular joint dysfunction (TMD) may include disorders related to the temporomandibular joint (TMJ) or the musculoskeletal structures, characterized by pain or discomfort in the TMJ or both. It is the main cause of non-dental pain in the orofacial region, and may lead to the restriction of mandibular movement, increased muscle tension, and grinding, affecting the quality of life of the individual[7]. Furthermore, functional overload in the TMJ can occur during aging, caused by the failure to replace missing teeth, parafunctional habits, poor occlusion or even trauma/disorders[8].

With such disorders in the oral cavity, it is pertinent to suggest that the elderly can suffer from TMD. The data available on this condition are conflicting, however. While some studies indicate that it may be present[9] or rare[10,11] among the elderly, other studies report that the elderly in general may suffer from TMD[12].

In view of the above, the objective of the present study was to conduct a survey of scientific literature in order to identify the factors associated with temporomandibular joint dysfunction in elderly persons.

METHOD

A descriptive, integrative review type study was performed[13]. Six methodological steps were applied: 1) establishing of the research question; 2) literature search; 3) data evaluation; 4) categorization of studies; 5) interpretation of results and integration of data; and 6) presentation of the integrative review. The following guiding question was used: "What factors are associated with temporomandibular dysfunction in elderly persons?".

The search for scientific articles was carried out in October 2017 and the following databases were accessed: MEDLINE/PubMed (Medical Literature Analysis and Retrieval System Online), SCOPUS (Bibliographic Database), WEB OF SCIENCE (Bibliographic Database) CINAHL (The Cumulative Index to Nursing and Allied Health Literature) and LILACS (Latin American and Caribbean Literature in Health Sciences). No language or date restrictions were applied in order to increase the sensitivity of the search. The search strategies used to locate the articles in each database are described in Chart 1. Where applicable, descriptors of the MeSH (Medical Subject Headings) and DeCS (Health Science Descriptors) were used.

Chart 1. Database search strategies used. Recife, PE, 2018.

DATABASE	SEARCH STRATEGY
MEDLINE/PubMed	((*"temporomandibular joint disorders"[MeSH Terms] OR* ("temporomandibular"[*All Fields] AND "joint"[All Fields] AND "disorders"[All Fields]) OR "temporomandibular joint disorders"[All Fields]) AND ("aged"[MeSH Terms] OR "aged"[All Fields])) AND ("aged, 80 and over"[MeSH Terms] OR "80 and over aged"[All Fields] OR "aged, 80 and over"[All Fields])*
SCOPUS	*(TITLE-ABS-KEY (temporomandibular AND joint AND disorders) AND TITLE-ABS-KEY (aged) AND TITLE-ABS-KEY (aged, 80 AND over))*
WEB OF SCIENCE	*(temporomandibular joint disorders) AND (aged) AND (aged, 80 and over)*
CINAHL	*temporomandibular joint disorders AND aged AND (aged, 80 and over)*
LILACS	*transtornos da articulação temporomandibular* (temporomandibular joint disorders) [Words] *AND idoso* (elderly person) [Words] *AND idoso de 80 anos ou mais* (elderly person aged 80 or older)[Words]

The review included scientific studies evaluating the factors associated with TMD in the elderly (60 years or older). Literature review articles and two articles written in Chinese and Japanese that were not available in full were excluded.

The selection of the studies was carried out in two stages: reading of the titles/abstracts and subsequent complete reading of the selected papers. The first stage was carried out independently by two investigators, based on the inclusion and exclusion criteria, classifying the potentially eligible studies and disregarding the duplicates. In the second stage, the selected articles were read in full and divergences during selection were resolved through a consensus meeting between the researchers.

Data collection was carried out using a data extraction form, created specifically for this review, containing the following items: author, year, country, sample size, gender, objective, assessment instruments and variables associated with TMD (Chart 2). Using the extracted data, analysis of the risk of bias of the articles was performed using the adapted version of The Newcastle-Ottawa Scale (NOS) for cross-sectional studies[14-15]. The NOS scale evaluates the methodological quality of a study in terms of the selection of study groups, comparability between groups and outcomes. For each scale item, a high quality is represented by a star, while low quality is shown without a star.

RESULTS

The search in the selected databases resulted in the identification of 888 articles with the potential for inclusion in this integrative review, of which 400 were duplicates and were subsequently disregarded. Of the remaining 488 articles, 16 were read in full. Of these, 12 did not meet the eligibility criteria and were excluded. Finally, four papers[17-20] were selected to compose the present review. The steps comprising the process of selection of the studies are shown in the flowchart proposed by PRISMA[16] (Figure 1).

Of the four articles included[17-20], two involved special populations (institutionalized individuals) and all were cross-sectional studies. Two were carried out in Brazil, one in Sweden and the other in the United States. The sample size of the studies ranged from 117 to 8,619 elderly people of both genders, aged 60 to 94 years, and the year of publication ranged from 1990 to 2016 (Chart 2).

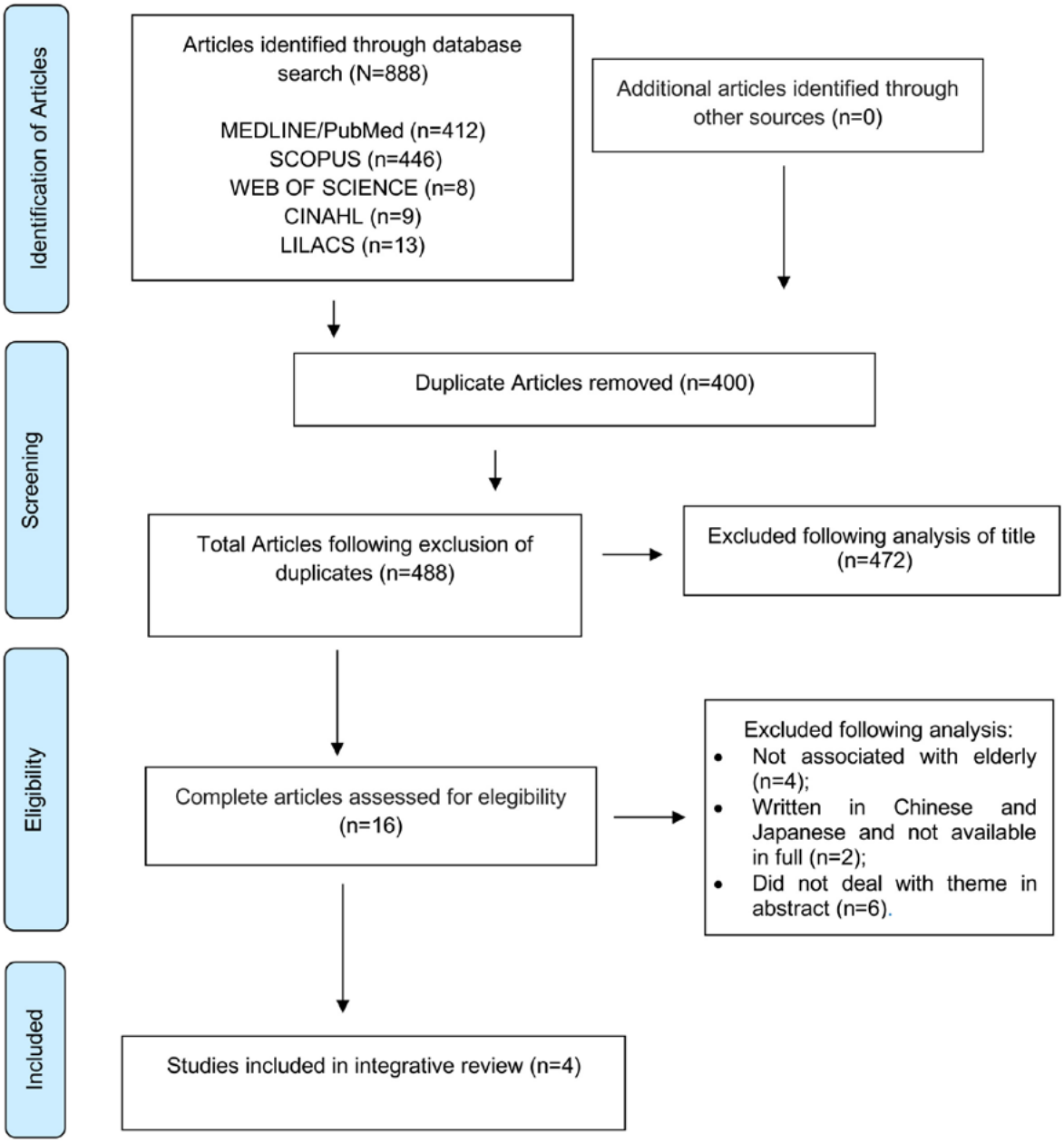

Figure 1. Flowchart of stages of selection process of articles in accordance with PRISMA. Recife, PE, 2018.

Chart 2. Overall characteristics of articles included in the review. Recife, PE, 2018.

Author, year, country	Sample size and gender	Objective	Assessment Instruments	Variables associated with TMD
Sampaio et al., 2016, Brazil[17]	307 Elderly persons of both genders.	To determine the factors associated with TMD in institutionalized and non-institutionalized elderly persons.	Fonseca anamnestic index (FAI).	TMD in 50.5% of the sample. Non-institutionalized (49.8%) and institutionalized individuals (52.5%). Prevalence of TMD, with statistical significance for women, aged 60-70 years, with a low income, presence of tinnitus, dizziness and depression.
Camacho et al., 2013, Brazil[18]	200 Elderly persons of both genders.	To investigate the prevalence of TMD in the elderly and association with palpation of the TMJ and the masticatory and cervical muscles, as well as the presence of headaches and joint noises.	Anamnestic questionnaire, evaluation of TMJ and muscular examination.	TMD in 61% of the sample. Higher among women (72.4%). Significant association between severity of TMD and palpation of the TMJ ($p = 0.0168$), the masticatory muscles ($p < 0.0001$) and the cervical muscles ($p < 0.0001$). Headaches and TMD present.
Carlsson et al., 2014, Sweden[19]	8619 Elderly persons of both genders.	To assess the prevalence of TMD-related symptoms in two population samples, aged 70 and 80 years in two Swedish counties.	Questionnaire with 53 questions. Prepared by the researcher.	TMD in 34% of the sample. Among those aged 70, the prevalence was 12% of women and 7% of men. Among those aged 80 years, the prevalence was 8% and 7%. Bruxism was associated with TMD.
Harriman et al., 1990, USA[20]	117 Elderly women.	To examine the association between TMD and age, education, mental status, physical functions, arthritis and dental health in an elderly population.	Pfeiffer's Mental State Questionnaire. Williams test. Pre-structured questionnaire created by the authors. The diagnostic criteria for signs and symptoms of TMJ developed by Fricton and Schiffman were used (cracking, locking, opening, lateral deviation, crepitus and coarse crepitus).	TMD in 22% of the sample. Associated with the presence of complete dentures ($p = 0.05$) and the absence of posterior teeth.

Key: TMD: Temporomandibular Disorder; TMJ: Temporomandibular Joint.

All articles were written in English and presented the following risk of bias scores according to the NOS scale: one with seven stars[19], indicating a low risk of bias, and the remainder with five stars[17,18,20], representing an intermediate risk. The results of the risk of bias analysis are shown in Chart 3.

Chart 3. Risk of bias analysis based on The Newcastle-Ottawa Scale (NOS) for cross-sectional studies (adapted)[14]. Recife, PE, 2018.

	SELECTION				COMPARABILITY	RESULTS	
	Sample representativeness	Sample size	Non-respondents	Instrument	Confounding Factors controlled	Assessment of results	Statistical Test
Sampaio et al., 2016, Brazil[17]			NR	**	*	*	*
Camacho et al., 2013, Brazil[18]			NR	**	*	*	*
Carlsson et al., 2014, Sweden[19]	*	*	*	*	*	*	*
Harriman et al., 1990, USA[20]			NR	**	*	*	*

Scoring: Selection – Up to five stars; Comparability – Up to one star; Result – Up to three stars. Key: NR – Not reported *by researcher.*

In the evaluation of the methodological quality of the articles based on selection, only the Swedish study reported the representativeness of the sample through random sampling, and a comparison was made between respondents to the questionnaires and non-respondents. The other three studies had a selected group of users (self-reported information), did not describe the sample calculation and did not report the non-response rate.

Regarding comparability and results, the four studies were presented in a similar manner, with control for additional factors, self-reported results and a statistical test for analysis of the described and appropriate data (with confidence intervals and *p* value). The main factors associated with TMD in the elderly persons identified in this review were: being female, age 60-70 years, low income, suffering from tinnitus, dizziness, depression, headache or bruxism, TMJ palpation pain and pain in the masticatory and cervical muscles, a reduced number of teeth and the use of complete dentures.

DISCUSSION

The aging process often brings with it changes that affect both general and oral health, and which become part of the functional decline of the individual due to chronic and behavioral conditions related to time and health[21].

When the signs and symptoms of TMD described in the studies studied were analyzed, no consensus of results was found among the authors[17-20]. One study reported an association between the severity of the disease and the presence of pain related to TMJ palpation, headaches and pain in the masticatory and cervical muscles[18]. Others related TMD to bruxism[19], the absence of the posterior teeth and the use of complete dentures[20], and ontological factors such as tinnitus and dizziness, as well as depression[17]. Although these signs and symptoms are frequent in patients with TMD, they cannot be considered diagnostic symptoms, as they can also be found in individuals who do not suffer from the disease[22].

There was a higher prevalence of TMD among women[17-20], a finding that agrees with the results of other studies[23,24], with women affected more frequently. Emotional factors[25], hormonal changes (menopause)[26] and anatomical disorders, related to poor posture of the occipital condyles, TMJ anterior disc displacement and ligament laxity are factors indicated as possible explanations[27,28].

The conditions of social inequalities of a population reflect a differentiation in the epidemiological profiles when different groups are observed. Thus, the socioeconomic, cultural and environmental conditions of a population generate a stratification of individuals and population groups, with different social positions that are directly related to health conditions. These disparities are expressed through income, education and social class, representing social inequalities[29]. With the objective of determining which sociodemographic factors were associated with TMD in the elderly, Sampaio et al.[17] analyzed the prevalence of this disorder among different educational levels and observed that non-institutionalized elderly individuals who studied up to elementary school only had a prevalence of TMD of 62.7%.

Sampaio et al.[17], 307 elderly people of both genders, 80 of whom were institutionalized and 227 of whom were non-institutionalized. The overall prevalence of TMD was 50.5%, while among non-institutionalized elderly persons it was 49.8% and among institutionalized elderly persons it was 52.5%. Among the non-institutionalized elderly, there was a higher prevalence of TMD in those aged 60-70 years (59.5%), those with a low income (100%), and those with tinnitus (64.4%), dizziness (68.4%) and depression (67.2%)[17]. These data corroborate with other studies that described tinnitus and dizziness as common symptoms among the elderly[30,31], as well as among individuals with TMD[32,33]. They differ from a study carried out with elderly institutionalized women in Minnesota[20], which found no association between the severity of TMD and age group and observed a tendency for the symptoms of the disease to decrease with increasing age, becoming completely absent in those aged over 80 years.

In the study by Carlsson et al.[19] it was found that being elderly and suffering from bruxism can increase the odds of developing TMD three to six fold. Bruxism is a rhythmic attrition of the non-chewing movement of the teeth and jaw. It is related to parafunctional activities and may occur when

the individual is asleep or during the day. It can be associated with dental tightening, biting of the lip, cheek or other objects, thumb or finger sucking, improper posture habits, as well as other habits that individuals perform, mostly unconsciously[34].

The loss of teeth or edentulism can alter the mechanics and pressure in the mouth, and thus cause a mechanical overload of the TMJ, leading to clinical disorders[35,36]. This finding was observed in the study by Harriman et al.[20] who verified that the absence of posterior teeth and the use of complete dentures influenced the presence of TMD. This result disagrees with the study by Ribeiro et al.[37] in which no association was found between the use of dentures and TMD.

Depression was the strongest predictor associated with the prevalence of TMD[17]. In many studies, psychological factors are indicated as etiologic for TMD, however, little is known about the relationship between TMD and the neurophysiological etiology of depression[38,39]. For institutionalized individuals, the prevalence of TMD among those with depression was 72.2%[17], representing an increase in comparison with those without depression (67.2%).

There was divergence between the selected studies in terms of sample size. Most of the studies did not perform sample calculations, which may limit the interpretation and generalization of the results and the conclusion of this review. Only one study reported on the cognitive assessment test used prior to data collection with the elderly[20]. None analyzed the issue of swallowing and the nutritional status of those interviewed with TMD. In addition, the samples were selected for convenience, in a non-random manner and identified in a specific health service[17,18,20], which may generate selection bias. The present review found that several instruments were used to evaluate TMD, and the studies included used validated measurement tools or those described by the authors. There was no report of a specific instrument adapted for elderly people in the articles analyzed, however, which may reflect a calibration bias and interfere with the results obtained.

CONCLUSION

The present integrative review revealed that the main factors associated with temporomandibular dysfunction in the elderly were: female, 60-70 years old, low income, suffering from tinnitus, dizziness, depression, headache or bruxism, having pain related to palpation of the temporomandibular joint, the masticatory and the cervical muscles, a reduced number of teeth and using complete dentures.

The growing number of elderly persons has resulted in a high number of surveys aimed at this audience. Emotional and social factors and systemic pathologies can affect the elderly, and it is essential to understand the morphological and pathological disorders that may be associated with the same.

Understanding the health and well-being of the elderly is essential, not only for the elderly individuals themselves, but also for health professionals, in order to achieve the correct diagnosis and provide better care, and for the economic and social care systems. Such knowledge makes it possible to plan a range of health policies and services and to provide social support, subsequently improving the quality of life of the elderly.

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Factors associated with multimorbidity in the elderly: an integrative literature review

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Abstract

Objective: The objective of the present study was to identify factors associated with multimorbidity in the elderly through an integrative literature review. *Method*: The "Cochrane Library", "MEDLINE", "Web of Science", "Scopus" and "LILACS" databases were used, as well as the "SciELO" virtual library and the electronic search engine "Google Academic". The following search terms were applied: "multimorbidity"; "multimorbidity"; "comorbidity; "multiple diseases"; "elderly"; "major adults", "older people", "older persons", "aged", "associated factors", "correlated factors", "socioeconomic factors" and "demographic factors." The inclusion criterion was that the object of the study was the elderly population with multimorbidity. Studies in which multimorbidity was not the dependent variable were excluded. *Results:* a total of seven articles were included in this review. A prevalence of multimorbidity in the elderly ranging from 30.7% to 57% was found. The associated factors were smoking, alcohol consumption, lived in rural areas, low levels of schooling, the female gender, older elderly persons and not living with children. In the majority of articles a low level of family income was also associated with multimorbidity. *Conclusion:* The results suggest that multimorbidity in the elderly is a common condition and that it is influenced by socioeconomic and demographic factors, lifestyle and family structure.

Keywords: Elderly. Multimorbidity. Chronic Disease.

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INTRODUCTION

In modern times, it has become increasingly important to take care of one's health, since reducing vulnerability to illness strengthens protection against disability, chronic suffering and premature death. In the elderly, specifically, identifying and seeking to reduce the factors that lead to illness is crucial, as this segment of the population is characterized by vulnerability and the reduction of functional capacity in their stage of life[1].

Although infectious diseases remain and are still important, there is a significant increase in chronic non-communicable diseases[2]. Such conditions are capable of generating disabilities and a high level of limitation in activities of daily living and leisure, as well as placing great pressure on the health services[2].

With the increase in life expectancy and the occurrence of chronic diseases, multimorbidity, which corresponds to the occurrence of different health problems in the same individual, is a frequent problem, especially in the elderly population[3]. Although this concept is well-established in literature, the definition of multimorbidity in relation to the number of chronic conditions considered varies greatly, with some authors considering the condition to be the presence of at least two chronic diseases and others the presence of at least three[4].

Considering its prevalence, severity and impact on quality of life, multimorbidity is a current public health problem[5]. The global prevalence of different health problems in the elderly is high, with a percentage of over 50% and, according to studies, there is a tendency for this number to increase[6-9]. The consequences of multimorbidity include greater risks of death and functional decline, as well as an impact on the reduction of life expectancy[10,11]. Although it can be controlled, adequate management of multimorbidity is a challenge for global health systems and services due to the high cost and complexity of treatment[6,12].

The identification of associated factors related to the prevalence of multimorbidities, through current data, is paramount for the definition of health policies aimed at the prevention of disease, and to support the formulation of public policies in the areas of health promotion, vigilance and care[13].

The present study therefore aimed, through an integrative literature review, to identify factors associated with multimorbidity in the elderly.

METHOD

An integrative review of cross-sectional and longitudinal studies published in literature was carried out to identify factors associated with multimorbidity among the elderly. The inclusion criteria consisted of cross-sectional or longitudinal studies with the object of study the elderly population (individuals over 60 years old) with multimorbidity.

The review included studies that considered multimorbidity to be the accumulation of two or more chronic diseases, and those that considered it to be the accumulation of three or more. In addition, chronic diseases were considered to be those proposed in 1957 by the Cambridge Commission on Chronic Diseases (United States), which include all conditions containing at least one of the following characteristics: permanence, presence of residual disability, non-reversible pathological alteration to the body system, need for special training of patient for rehabilitation and provision of a long period of supervision, observation and care[14].

There was no restriction of year of publication and language. We excluded studies evaluating multimorbidity and its associated factors in children, adolescents and adults. In addition, we also excluded studies in which multimorbidity was not considered as the dependent variable.

The electronic search strategies were conducted by three researchers, independently, during the period from May 2018 to July 2018, in the Cochrane Library, MEDLINE, Web of Science, Scopus and LILACS databases. The "SciELO" virtual library and the "Google Scholar" electronic search engine were also used. The following descriptors and/or keywords were used: *"multimorbidity"; "multi-morbidity"; "comorbidity"; "multiple diseases"; "elderly"; "major adults", "older people", "older persons", "aged", "associated factors",*

"correlated factors", "socioeconomic factors" and "demographic factors". In addition to surveying the aforementioned databases, manual searches were also carried out using the references of articles on the subject. The search strategies developed for each database are described in Chart 1.

After the database and manual searches, the titles and abstracts were organized into a standard form. Using the same selection criteria, the three main researchers then chose the studies with the potential to be read in their entirety and included in the review.

Data from the studies read in full and included in the review were recorded in a data extraction sheet by the three authors who independently and jointly recorded data relating to the survey (sample, country where the study was conducted and factors associated with multimorbidities), methodological characteristics (type of study) and outcomes.

In the presence of disagreements, the authors consulted a fourth author and, through a consensus, reached a common decision. For the evaluation of the quality of the selected studies, the method proposed by Loney[15] was used, which critically evaluates studies on the prevalence or incidence of health problems. This critical evaluation is based on eight items: appropriate study design, sampling process design, adequate sample size, use of validated methods, unbiased measurement of data, sample loss of less than 30%, confidence intervals present in the sample, determination of prevalence or incidence and detailed description of study subjects. Each of these items, when appropriate, scores 1 point, and in total each study can vary in score from 0 to 8 points.

RESULTS

The electronic search strategy used resulted in 356 titles and abstracts. Of these, 25 were selected from the inclusion and exclusion criteria and read in their entirety. The manual search, made from the references of the articles read in full, resulted in the retrieval of one article. In the end, seven studies were selected for inclusion in the review (Figure 1).

Chart 1. Search strategies used in databases, virtual library and electronic search engine.

BASE	STRATEGY
Pubmed, Medline	("*multimorbidity*" OR "*multi-morbidity*" OR "*multiple diseases*" OR "*comorbidity*") AND ("*elderly*" OR "*major adults*" OR "*older people*" OR "*older persons*" OR "*aged*") AND ("*associated factors*" OR "*correlated factors*" OR "*socioeconomic factors*" OR "*demographic factors*")
Web of Science	TS=("*multimorbidity*" OR "*multi-morbidity*" OR "*multiple diseases*" OR "*comorbidity*") AND TS=("*elderly*" OR "*major adults*" OR "*older people*" OR "*older persons*" OR "*aged*") AND TS=("*associated factors*" OR "*correlated factors*" OR "*socioeconomic factors*" OR "*demographic factors*")
Scopus	TITLE-ABS-KEY("*multimorbidity*" OR "*multi-morbidity*" OR "*multiple diseases*" OR "*comorbidity*") AND TITLE-ABS-KEY("*elderly*" OR "*major adults*" OR "*older people*" OR "*older persons*" OR "*aged*") AND TITLE-ABS-KEY("*associated factors*" OR "*correlated factors*" OR "*socioeconomic factors*" OR "*demographic factors*")
Cochrane	"*multimorbidity*" OR "*multi-morbidity*" OR "*multiple diseases*" OR "*comorbidity*" and "*elderly*" OR "*major adults*" OR "*older people*" OR "*older persons*" OR "*aged*" and "*associated factors*" OR "*correlated factors*" OR "*socioeconomic factors*" OR "*demographic factors*"
Lilacs	"*multimorbidity*" OR "*multi-morbidity*" OR "*multiple diseases*" OR "*comorbidity*" [Words] and "*elderly*" OR "*major adults*" OR "*older people*" OR "*older persons*" OR "*aged*" [Words] and "*associated factors*" OR "*correlated factors*" OR "*socioeconomic factors*" OR "*demographic factors*" [Words]
Scielo	("*multimorbidity*" OR "*multi-morbidity*" OR "*multiple diseases*" OR "*comorbidity*") AND ("*elderly*" OR "*major adults*" OR "*older people*" OR "*older persons*" OR "*aged*") AND ("*associated factors*" OR "*correlated factors*" OR "*socioeconomic factors*" OR "*demographic factors*")
Google Scholar	"*multimorbidity*" + "*multi-morbidity*" + "*multiple diseases*" + "*comorbidity*" + "*elderly*" + "*major adults*" + "*older people*" + "*older persons*" + "*aged*" + "*associated factors*" + "*correlated factors*" + "*socioeconomic factors*" + "*demographic factors*"

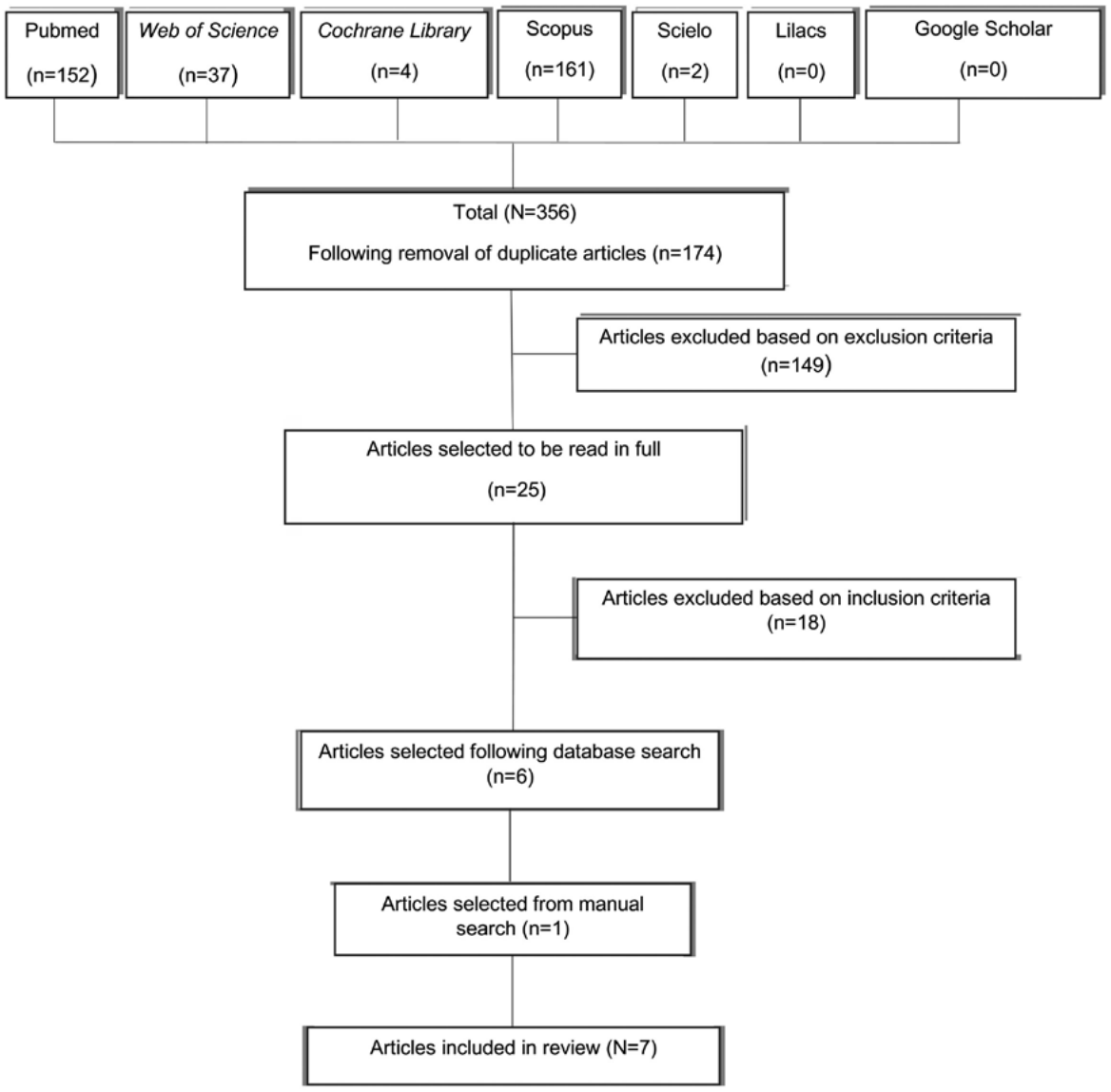

Figure 1. Flowchart of studies analyzed.

A total of 17,003 elderly persons were evaluated, of which 10,098 were women (59.39%). All the studies included in this review were cross-sectional studies. In these, multimorbidity was found to be associated with smoking, alcohol consumption, living in rural areas, low schooling, the female gender, older elderly persons, the use of health services in the preceding week, family structure (not living with children), polypharmacy and negative self-perception of health (Table 1). Although most studies reported an association between multimorbidity and low economic status, there was a divergence in the results, in this review, when assessing the influence of economic status on the prevalence of multimorbidity. The quality score of the studies ranged from 7 to 8 points.

Mini et al.[35] in 2017, aimed to calculate the proportion of elderly people with multimorbidity and identify the associated factors, as well as their implications. A total of 9,852 elderly people aged 60 or over were interviewed. As a result, the authors found that in individuals aged ≥ 70 years, alcohol users, women, tobacco users, and those who were better off were more likely to suffer from multimorbidity.

Ha et al.[36], sought to determine the prevalence of multimorbidity in the elderly and to identify associated factors in an elderly population in southern Vietnam. The sample was 2,400 individuals aged 60 years or older. After a multivariate analysis, age, gender, and need for help when performing basic activities of daily living lost statistical significance. On the other hand, being illiterate, living in rural areas and using health services in the previous week were associated with the presence of multimorbidity.

In 2014, Banjare et al.[37] evaluated the prevalence of the accumulation of chronic conditions among rural elderly persons, as well as associated socioeconomic and demographic factors. A total of 310 elderly individuals were aged 60 years or older. The results obtained from logistic regression analysis showed that older elderly persons, those who were economically dependent and those who smoked were more likely to present multimorbidity. In 2013, Jerliu et al.[38] evaluated the prevalence of multimorbidity and associated demographic and socioeconomic factors in elderly people in Kosovo. A total of 1,890 individuals aged 65 years and over participated in the study. A total of 45% of the elderly had at least two chronic diseases. Based on a multivariate analysis, the factors related to the presence of multimorbidity were the female gender, advanced age, self-perceived poverty and difficulty accessing medical care.

Agborsangaya et al.[39], in 2012, aimed to identify the prevalence of multimorbidity and its sociodemographic factors in adults aged 18 years or older. This study evaluated different age groups, including elderly people aged 65 or over. The sample corresponding to the elderly was 776 individuals. For this population group, multimorbidity was associated with females and those who did not live with children. In 2008, Marengoni et al.[40] investigated the role of age, gender and socioeconomic status in the occurrence of multimorbidity in the elderly aged from 77 to 100 years. Old age, the female gender and a lower level of schooling were shown to be associated with multimorbidity.

Finally, in 2017, Cavalcanti et al.[41] sought an association between multimorbidity in the elderly and sociodemographic variables, self-perception of health and polypharmacy. The sample consisted of 676 individuals aged 60 years or older residing in small municipal regions in the north of the state of Rio Grande do Sul, Brazil. Following adjusted analysis, the occurrence of multimorbidity was associated with the variables: negative perception of health and use of polypharmacy. In the crude analysis, multimorbidity was related to the female gender, advanced age, low socioeconomic level and mental disorders. However, when performing the adjusted analysis, these variables lost significance.

Table 1. Characteristics and summary of results of studies included in review.

Author and year of study	Type of study	Aim and location of study	Sample and prevalence of multimorbidity	Factors associated with multimorbidity	Score and limitations
Mini et al. 2017[35]	Cross-sectional	The present study aimed to calculate the proportion of elderly people with multimorbidity, their associated factors and implications. The present study included elderly people from seven states of India (Kerala, Tamil Nadu, Punjab, Himachal Pradesh, Maharashtra, Orissa and West Bengal).	The prevalence of multimorbidity was 30.7% (3024 elderly), among a sample of 9852 elderly .	Richer (PR=4.68) and older (70 years or older) (PR=2.44) elderly persons, women (PR=1.51), and alcohol (PR=1.53) and tobacco (PR=1.22) users were more likely to suffer from multimorbidity.	8 points
Ha et al. 2015[36]	Cross-sectional	The study aimed to examine the prevalence of multimorbidity and associated factors among elderly people in Southern Vietnam.	39.2% of the elderly persons (941 individuals) exhibited multimorbidity. The sample was 2400 elderly persons.	The prevalence of multimorbidity is more statistically significant in illiterate individuals (p= 0.001), those who did not work (p=0.001), those who live in rural areas (p<0.001), and those who used health services in the week before the interview (p=0,001).	8 points
Banjare et al. 2014[37]	Cross-sectional	To investigate the prevalence of multimorbidity in rural elderly people and associated socioeconomic and demographic factors. The survey was conducted in the Bargarh district of Odisha, India.	A total of 310 elderly persons were evaluated, of which 177 had multimorbidity (prevalence of 57.0%).	Logistic regression analyzes revealed that older elderly persons (75 years of age or older) (PR=4.65), those who are financially dependent (PR=5.21), and those who smoke (PR=1.85) had a greater chance of acquiring multimorbidity.	8 points
Jerliu et al. 2013[38]	Cross-sectional	To identify the prevalence of chronic morbidity and to seek associations with demographic and socioeconomic factors in an elderly population in Kosovo.	In the present study, 45.0% (851 individuals) of the elderly population had multimorbidity. The sample consisted of 1890 elderly people .	Factors associated with multimorbidity were the female gender (p=0.001), advanced age (p<0.001), self-perceived poverty (p<0.001), and inability to access medical care (p<0.001).	8 points
Agborsangaya et al. 2012[39]	Cross-sectional	This study aimed to estimate the prevalence of multimorbidity and associated factors in different age groups in the province of Alberta, Canada.	The sample corresponding to the elderly was 776 individuals, of which 35.8% (278 elderly) exhibited multimorbidity .	For the elderly, multimorbidity was associated with the female gender (PR=1.55) and those who did not live with children (PR=8.45).	7 points. The elderly persons who participated in the study represented less than 30.0% of the total sample.

to be continued

Continuation of Table 1

Author and year of study	Type of study	Aim and location of study	Sample and prevalence of multimorbidity	Factors associated with multimorbidity	Score and limitations
Marengoni et al. 2008[40]	Cross-sectional	The aim was to investigate the role of age, gender and socioeconomic status in the occurrence of multimorbidity in elderly persons aged between 77 and 100.	In this study, 55.0% (602 individuals) of the elderly population had multimorbidity. The sample was composed of 1099 elderly persons.	Older elderly persons (aged 85 or older) (PR=1.9), women (PR=1.5) and those with lower levels of schooling (PR=1.6) had a greater chance of exhibiting multimorbidity.	7 points. The sampling process was not described.
Cavalcanti et al. 2017[41]	Cross-sectional	To verify the association between multimorbidity and sociodemographic variables, self-perception of health and polypharmacy in the elderly. The study was carried out in small municipalities in the north of the state of Rio Grande do Sul, Brazil.	Of the elderly interviewed (676 individuals), 45.0% (304 elderly) exhibited multimorbidity.	After adjusted analysis, the occurrence of multimorbidity was associated with the following variables: negative health perception (p<0.001) and use of polypharmacy (p<0.001).	8 points

PR = Prevalence ratio; p = probability of significance ("p" values less than or equal to 0.005 were considered statistically significant).

DISCUSSION

The present study sought to identify, through an integrative literature review, the factors associated with the presence of multimorbidity in the elderly. As a result, all types of studies found that met the established inclusion criteria were included in the review. It was not, however, possible to perform a systematic review of randomized clinical trials, the level of scientific evidence of which is high. The objective of the present study is justified by the absence of elderly persons with multimorbidity in these types of studies, as in most methodological designs, this population group are removed following the application of the exclusion criteria precisely because they suffer from chronic diseases. With regard to the quality of the studies included, the results demonstrated reliability and internal and external validity, with scores ranging from 7 to 8 points, the latter being the maximum score.

From the results of the search strategy a small number of studies which included multimorbidity as the dependent variable were found, which made it difficult to identify more factors that could influence the effects of multimorbidity on the elderly. Furthermore, the age groups of the populations of the studies found varied, reflecting a low level of scientific evidence in responding to the objective of the present study.

In general, the results of the review point to an association between multimorbidity in the elderly and smoking, alcohol consumption, living in rural areas, low schooling, use of health services in the previous week, the female gender, older elderly persons, family structure (not living with children), polypharmacy and a negative self-perception of health. The studies diverged on the influence of economic status on the prevalence of multimorbidity[35-41].

With regard to lifestyle, only smoking and consuming alcohol were evaluated. Such habits have been found to be associated with multimorbidity, and this correlation can be explained by their interference with the adequate nutrition of the elderly, since alcohol and tobacco compete with nutrients from ingestion to absorption and use[42]. In addition, from a public health perspective, alcohol and tobacco are among the five most important risk factors for the emergence of chronic non-communicable diseases[42].

The strong association between rural living and multimorbidity in the elderly may be due to the poor availability of health services and access to information in these places, which result in fewer opportunities for these elderly people to acquire the healthy habits that prevent the accumulation of chronic diseases[43]. Due to this situation, more efforts should be made to improve health services in these areas, especially for the elderly.

With regard to literacy, the results indicate that people with greater education are less likely to suffer from multimorbidity. Education empowers an individual to seek knowledge. Therefore, educated people may be able to access more information on health promotion and adopt healthy lifestyles, preventing the onset of certain chronic diseases[36].

The use of health services in the preceding week was positively associated with the prevalence of multimorbidity in the study by Ha et al.[36] As the authors established multimorbidity as a dependent variable, the results suggest that the use of health services in the preceding week results in a greater prevalence of multimorbidity. As it is a cross-sectional study, the cause-and-effect relationship of the studied variables cannot be well-established. Therefore, the use of these services seems to be a consequence of the accumulation of chronic diseases, rather than the other way around, since in cases of poorer general health, the elderly seek health services more frequently.

The same occurred with the variables polypharmacy and negative self-perception of health in the study by Cavalcanti et al.[41] The use of several drugs and the reporting of poor or very poor health seem to be a consequence of the accumulation of chronic diseases, rather than the other way around. The use of polypharmacy can be understood by elderly people's frequent need to take medications for the treatment of chronic diseases, while self-perception of health tends to be negative due to the greater number of hospitalizations of elderly people who suffer from multimorbidity.

In studies that sought to associate multimorbidity in the elderly with socioeconomic and demographic factors, there was some divergence regarding the associations with gender and family income[35-38,41]. Ha et al.[36] and Cavalcanti et al.[41] found no association between multimorbidity and the female gender, whereas Mini et al.[35], Jerliu et al.[38], Agborsangaya et al.[39] and Marengoni et al.[40] identified such an association. The same thing occurred with economic status. In the study by Mini et al.[35] an association between multimorbidity and richer elderly persons was observed, whereas Banjari et al.[37] and Jerliu et al.[38] observed an association between multimorbidity and self-reported poverty and financial dependence.

The divergence between these studies in relation to such variables may be due to the different age groups of elderly persons analyzed. Mini et al.[35], Ha et al.[36], Banjare et al.[37] and Cavalcanti et al.[41] considered elderly persons aged 60 years or older, while Jerliu et al.[38] and Agborsangaya et al.[39] considered the elderly as being those aged 65 years and over. Marengoni et al.[40], meanwhile, studied only elderly persons aged from 77 to 110[35-41]. The association between the female gender and the prevalence of multimorbidity may be related to the fact that women have a longer life expectancy and worse health status than men[35,38,39].

Most of the studies found that older and poorer elderly persons tend to have higher occurrences of multimorbidity[36,38]. It is suggested that older elderly persons tend to have more multimorbidities than younger elderly individuals people due to physiological aging[38]. With regard to poorer individuals, economic difficulties continue to be a strong predictor of health, even in the elderly. Poverty appears to be part of a vicious circle: a low income during adulthood favors the persistence of poverty in the aging phase, which in turn contributes to poor health outcomes[38].

The fact that the high prevalence of multimorbidity is affected by whether the elderly person lives with children or not suggests that living with other people, irrespective of whether it is a spouse, child or grandchild, is extremely important for the health care of the elderly. In addition, the importance of family support through the management of chronic diseases may be an important component in reducing the likelihood of developing other chronic conditions[39].

The present review found that the prevalence of multimorbidity in the elderly varies from 30.7% to 57.0%. This broad variation may have occurred due to the study of distinct age groups of elderly persons, as well as the variety of chronic diseases assessed in the different studies. The results showed that multimorbidity is a very common condition in the elderly. Thus, in order to tackle the health care related challenges that aging brings for society, it is necessary to review the organization of health services. Further efforts should be directed at educating health professionals to prioritize primary health care, with a focus on chronic disease prevention. Furthermore, additional health care related to multimorbidity should be dedicated to older, female elderly persons and rural residents.

Finally, considering the small number of studies that include multimorbidity as a dependent variable and that evaluate its associated factors, as well as the divergences regarding the influence of socioeconomic variables, studies with greater population coverage that evaluate the factors associated with multimorbidity in the elderly are required to confirm the results of this review.

CONCLUSION

In conclusion, the results indicate that multimorbidity in the elderly is a relatively common condition which is influenced by socioeconomic, demographic, lifestyle and family structure factors. The influence of the economic status of the elderly is not yet a consensus in literature.

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