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# Revista Brasileira de Geriatria e Gerontologia

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Editorial

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# What is the ideal age limit for a person to be considered an older adult today?

While this is an old debate, it remains current even today. In this editorial we discuss a subject that has long been controversial, and which involves discussions that are often permeated with explicit interests and other motives. Is there, then, an ideal age limit for a country, region or territory today?

In 2018, the Italian Society of Geriatrics and Gerontology adopted an age limit of 75 to be used when considering someone an older adult. According to the directors of the society, the limit of 65 was obsolete, as today's 65-year-olds have similar cognitive and physical functions to a 40- to 45-year-old person from 30 years ago. In this sense, and based on the Italian life expectancy (83 years for men and 86 for women), they proposed an age extension of another ten years before someone could be considered an older adult[1].

Similarly, it was recently reported that the UK intended to change the chronological age at which a person is considered older to 70. As Sara Harper of the Oxford Institute of Population Ageing says, "Old age does not arrive in one's seventies. It arrives when we become dependent"[2].

Based on what was happening around the world, IPEA researcher Ana Amélia Camarano argued in 2013, that when commemorating the tenth anniversary of the Statue of the Older Adult, it would be appropriate to raise the age limit for being considered older from 60 to 65, although the change did not occur. She stated that the aim would be to monitor the health conditions and life expectancy of the population approaching 75 at the time[3].

In 2018, in another interview, this time for the Folha de São Paulo newspaper, the researcher stated that the concept of an older adult had itself become old. She argued that in 2018 a 70-year-old would be similar to a 50-year-old in the past, and even a 60-year-old would no longer be like their grandparents. She also stated that, rather than redefining the borderline ages to be considered older, it was necessary that such an age limit be reflected in government policy. For Camarano, "the definition of older adult for people aged 60 and over dates from 1994. Since then, life expectancy has increased by six years"[4].

In this context, the Brazilian Institute of Geography and Statistics (or IBGE) declared in 2018 that Brazilian life expectancy at birth is 76.3 years, representing over 30 years of survival more than the current elderly population, which in 1950 had a life expectancy of 43.3 years[5,6]. Based on the life expectancy of the Brazilian people disclosed by the IBGE and considering a definition of ten years lower than life expectancy for considering a person older in Brazil, the limit would be 66 years.

Turning to the legal aspects of the discussion, in 2019, the Rio de Janeiro State Court of Justice ruled as unconstitutional 18 articles of a law approved by the state Legislative Assembly which, in 2018, had guaranteed that "older people aged 60 and above would have free admission to museums, public transportation, games, sporting events and other activities," ruling that the benefit should be valid only for people aged 65 and over[7]. Accordingly, the Statute of the Older Adult (Law 10,741, dated October 1, 2003) established a 65-year limit for access to certain rights, such as free public transport and the benefit of a minimum monthly salary for those who do not have the means to support themselves[8].

Considering a single age limit for the entire country seems somewhat unjust, however. Although life expectancy has risen, living conditions in many areas remain precarious, making life expectancies well below those of the country as a whole. Violence, unemployment, hunger, poverty and, above all, multiple forms of social inequities (ethnicity/skin color, social class, gender) have created multiple life expectancies in Brazil, where some areas have Japanese type levels and others have expectancies closer to sub-Saharan Africa.

Nevertheless, would it be wise to raise the chronological age for considering a person an older adult by five years? What are the costs and benefits of such an approach? In order to answer these questions, it is necessary to consider many aspects that directly impact people's lives, especially those in the age brackets that border the defining limit.

We therefore invite researchers, managers and professionals from various levels of health systems to consider and evaluate with us the government policies that permeate the subject, and invite them to submit their studies to a thematic issue of the Brazilian Journal of Geriatrics and Gerontology, which will evaluate these policies that interface with older adults.

**Kenio Costa Lima** ⓘD
Editor associado da RBGG, professor titular da UFRN, pós-doutorado em Saúde Pública pela Agência de Saúde Pública de Barcelona.

**Tamires Carneiro de Oliveira Mendes** ⓘD
Presidente do Conselho Estadual da Pessoa Idosa (CEDEPI/RN), pós-doutorado em Saúde Coletiva pela UFRN,
Sanitarista da Secretaria Municipal de Saúde do Natal, Consultora da RBGG.

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# The application of transpersonal and spiritual care for older adults receiving palliative care

Johnata da Cruz Matos[1]  ID
Silvia Maria Ferreira Guimarães[1]  ID

## Abstract

*Objective:* To identify the perception of nurses regarding spiritual care for older patients undergoing palliative care. *Methods:* A descriptive study with a qualitative approach was carried out with 27 care nurses at the Hospital Universitário de Brasília, Brazil, in 2018. The interviews were conducted through a semi-structured script and submitted to content analysis. The discourse structuring for the collective subject technique was applied. *Results:* Five discourses of the collective subject were constructed and grouped into two categories entitled Spiritual Care Provided By Nurses, and Favorable and Unfavorable Factors For the Provision of Spiritual Care For Older Patients. From the central nuclei contained in the reports, the respondents considered spiritual care and family participation in palliative care important. However, they mainly attributed the role of intervening in spirituality to religious volunteers and the family. *Conclusion:* The study shows that despite the difficulties in providing spiritual care, family support, moments of listening and the carrying out of activities that motivate inner peace are significant for an improved response to the spirituality of older patients.

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[1] Universidade de Brasília (UnB), Faculdade de Ceilância, Programa de pós-graduação em Ciências e Tecnologias em Saúde. Brasília, DF, Brasil.

Correspondence
Johnata da Cruz Matos
johnata.matos@hotmail.com

## INTRODUCTION

Aging is a natural process and represents a stage of human life. Technological advances have brought about a reduction in mortality rates resulting from improved sanitary conditions and a decrease in fertility rates due to birth control, meaning the age pyramid in Brazil continues to undergo a process of inversion, causing increased population aging. However, aging is also one of the risk factors for the development of chronic diseases, including cancer[1].

The development of the ability to think rationally and logically resulted in a need to try to understand the meaning of life and death, especially for individuals who had exhausted the therapeutic possibilities of a cure, and who required different care from those who seek healing treatment[1].

Palliative care is a modality of care granted to the patient and their family when faced with a disease or clinical condition that threatens the continuity of life. These interventions are provided by a multidisciplinary team that observe the patient in their physical, social, psychological and spiritual aspects, with the purpose of improving the quality of life, carrying out the prevention and identification of diseases, as well as relieving suffering and pain, permeated by effective communication. In this sense, this new approach is essential when clinical and therapeutic healing interventions are no longer effective[2].

In 2015, Brazil ranked 42nd in the Quality of Death Index, which evaluated the palliative care provided by eighty countries through the analysis of reports from health professionals, the existence of national policies and investments aimed at palliative care[3]. Despite Brazil's growth in relation to previous editions of the index (2009 to 2014), and the existence of legislation that ensures citizens' right of access to this type of therapy, the country continues to have difficulties in implementing quality of care[4].

While for many the terms spirituality and religiosity have the same meaning, they are in fact different processes. Spirituality corresponds to a unique knowledge of each individual that seeks explanations that go beyond their understanding of the existential process. It has an essential role in the process of care and treatment of diseases, as it is not based exclusively on religion, but on principles linked to its own values, and can thus be included in the various stages and contexts[1,5,6].

In contrast, religiosity refers to a practice based on belief and bringing the believer closer to specific deities. In this sense, religious activities govern a collective behavior and way of life that can be shared between people of the same religion[1,5,6].

The theorist Jean Watson became a reference within the nursing practice, as during her professional experiences she attributed a new meaning to care practice, advocating an approach that would allow her to go beyond scientific knowledge and consider humanistic aspects to meet the needs of the patient, family and community. Therefore, the Theory of Transpersonal Caring is defined as a framework that contemplates care in different scenarios and with greater interaction between the health professional and the patient[7,8].

Transpersonal Caring advocates the promotion of a spiritual approach in the care process. Nursing should not be based on the traditional biomedical model, which focuses only on curing diseases through a series of established protocols, but identifies spirituality as an important aspect in the patient's comprehensive care. In addition to including a spiritual dimension in care, Watson explains that through the nurse's interaction with the patient, it is possible to explore the emotions and subjectivity of both and analyze their relationship in the care process[9].

Palliative care has become increasingly present in nursing interventions for older patients. It is therefore necessary to understand the perception of nurses regarding the importance and meaning that spirituality has in care. Since these professionals spend more time with patients and family members during hospitalization, they often perceive their particularities more easily. In this sense, apprehending their perception is essential to broaden debates on this topic.

In the face of so many challenges involving the spiritual dimension in palliative care, the present study is based on the following guiding question: How do

nurses perceive the importance of spiritual care for older patients in palliative care? The study therefore aims to understand the perception of nurses about spiritual care for older patients in palliative care.

## METHOD

A descriptive study with a qualitative approach was carried out. To better understand the thoughts of the subject, group or collective unit, one should explore their ideas through qualitative knowledge, which aims to assess quality subjectively[10].

The study involved 27 care nurses from the Hospital Universitário de Brasília (HUB) in the period from July to November, 2018. The inclusion criterion was nurses who had worked in the Medical Clinical sector of the HUB for a minimum period of one year, with this time established to ensure that these professionals had sufficient experience with palliative care to achieve the research objectives. The exclusion criteria were nurses who were on vacation or leave during the period of data collection, as well as those who did not perform care activities, that is, who only worked in administrative roles.

Subsequently, the data were collected through an interview conducted with a semi-structured script, audio recorded in a private location, confirming the right of the participants to data confidentiality.

The interviews were transcribed in their entirety and analyzed using the content analysis technique, where ideas are described as a union of different methodologies which have the function of examining various forms of arguments, with the purpose of observing all the data obtained, whether verbal or non-verbal[11]. The textual corpus was submitted to the content analysis technique. Through the analysis of extracts from the discourse of the participants, it was possible to identify the central nuclei found in the reports, and this allowed the formation of

the DCS. In this sense, priority was given to the main approaches and meanings of spiritual care and organized to carry out the application of Jean Watson's Theory of Transpersonal Caring.

The technique of structuring the Discourse of the Collective Subject (DCS) brings together social representations, linking individual interpretations with collective perspectives, that is, it groups together particular ideas with a similar logic, to build a discourse that expresses the concept of the collective point of view[12]. There is no individual identification of the research participants, as the statements present a collective idea. The ethical recommendations were met, and the research was approved by the Ethics and Research Committee of the Faculdade de Ceilândia (the University of Ceilândia) (FCE), of the Universidade de Brasília, under decision number 2.642.997 on 08/03/2018.

## RESULTS

The studied sample consisted of 27 nurses who work in direct palliative care for older adults with no possibility of cure, as described in Table 1.

Of the participants, 74% were female. When asked how much nursing training they had, 37% had fewer than five years, 37% had five to ten years, and 26% had more than ten years of training.

Regarding the length of experience with palliative care, all participants had less than five years and 51.5% reported having completed at least one training program focused on the topic of palliative care and terminality of life.

The technique of content analysis and the structuring of the discourse of the collective subject allowed two categories to be distinguished, entitled Spiritual Care Provided By Nurses, and Favorable and Unfavorable Factors For the Provision of Spiritual Care.

**Table 1.** Distribution of the sociodemographic characteristics of the participants. Brasília, Distrito Federal, 2019.

| Analyzed variable | N (%) |
|---|---|
| Sex | |
| Female | 20 (74%) |
| Male | 07 (26%) |
| Years of nursing training | |
| Fewer than 5 | 10 (37%) |
| From 5 to 10 | 10 (37%) |
| More than 10 | 07 (26%) |
| Years of experience with palliative care | |
| Fewer than 5 | 27 (100%) |
| From 5 to 10 | - |
| Participation in training courses | |
| Did not participate | 13 (51.5%) |
| Participated in training | 14 (48.5%) |

## Spiritual Care Provided By Nurses

When faced with nursing care based on biomedical models and focused only on curing the disease, an approach that values the patient fully is required, treating each individual according to their specificities and diverse needs, as noted in DCS 1.

> Care is not just about providing nursing care. All of this involves psychological, spiritual, religious aspects, because everyone is different, everyone has their own beliefs. We have to know how to respect the opinion of the individual. The spiritual part is very important. Knowing that we don't take anything with us from this life. So, we work with pain control, psychological work, comfort, in general, so that the patient even improves during the stage of accepting their own death, especially older patients. However, more important than the technique, than the technical procedures, I think, is this more humanistic approach, to see the patient as a being, who thinks, with needs, who has their religion, who has their beliefs, their values.

From this discourse, it can be seen that the participants believe that addressing spiritual aspects improves the acceptance of older patients in palliative care in the process of the finitude of life.

In addition to ensuring the opinions of individuals and maintaining respect for their religious beliefs, nursing professionals place pain relief as a priority.

Due to the large number of patients, the overburden of work and the excess of technical procedures, the care team is limited to promoting care focused on the biological aspect, relegating care in the other dimensions to a secondary level and not providing adequate spiritual support to the patient, the family and the nursing team itself.

In DCS 2, it can be seen that most participants delegate the function of providing spiritual care to other professional classes, religious entities and even family members.

> In reality, it's not our job, is it? There is work with psychosocial and spiritual aspects, but as in the hospital, nurses are more involved than any other health professional, we try a bit. But care focused on spirituality offered by nursing on a continuous basis doesn't happen. There are also visits, because this is a hospital open to all beliefs and religions and creeds, so each creed, belief, has its spiritual support. So, the spiritual part is mostly up to the volunteers. We promote listening and are more focused on prescription. It is what is written there, it's care. As at some points the patient just wants

a word of comfort, a friendly word and, due to our routine, we are sometimes unable to do this. Then, sometimes, the family also takes on this very important role.

According to the discourse, representatives of different religions provide spiritual support, and according to the participants, mistakenly, this function is not seen as attributed to nursing professionals.

The presence of contradictory concepts can be perceived and this shows us that the participants confuse the meaning of spirituality with religiosity, which may impair the choices of interventions to be provided during spiritual care, as religion provides only part of the spiritual dimension.

The participants, despite attributing the spiritual approach to religious volunteers, promote and stimulate therapeutic listening, which is one of the main methods used in spiritual care. In this sense, the participating nurses do not realize that this is a therapeutic action in the care process.

DCS 3 shows the importance of including the family in the care process. A family educated about conduct within palliative care can act as an aid to the team. However, an uninformed and non-participative family assumes the role of subject to be cared for by the patient.

> If the family does not participate, the patient feels rejected, feels angrier, often they have accepted that there is no point in care and that they are really going to die, so if they realize that the family is there more, they accept it more easily because they know that they're there and they are being cared for, so there is still a prospect of improvement, they might still go home. So, all this has an effect. The family is an antidepressant, the family is often better than medicine. The medication eases their pain, internal pain, the pain suffered, but only the family works for the mind. The approach of the family is essential. So, family is not only a wife, children and grandchildren, you know? Family is who the patient considers family, be it a friend, a companion, a cousin, a neighbor or even a pet. I think the participation of someone n is very important. Nobody wants to die alone, do they?

In care, the importance of the family is well-known, as patients accompanied by their families have a more positive response during the treatment provided, that is, it is not only medication that relieves pain and discomfort, but the support of relatives. On the other hand, those who remain alone, in addition to feeling abandoned, do not express an expectation of progress or improvement of symptoms.

It is possible to observe the benefits if the team includes family members in the process; however, it is important to highlight that nursing professionals must respect the patient's opinion of who makes up their family.

## Favorable and Unfavorable Factors For the Provision of Spiritual Care to Older Patients

It can be seen that in DCS 4 that, when nursing professionals act in a cohesive manner that is focused on the needs of the patient and their family, care becomes more effective and patients experience humanized care.

> What makes it easier? It really is the team, because here the team is really united, organized, we see this commitment, with the patients. The team here is very human. It is important to try to respect the autonomy of the patient. The older patient wants an activity to distract themselves, a painting, a craft or something they have always done at home, we can detect this wish, and if they're able, we offer the activity. We had a patient that painted. She had been a teacher and did several drawings during the day and she gave it to the other patients. So, we put it on the headboard and it was really cool. She felt good about painting. She let us know that she was satisfied. When she was doing this the whole team was involved, encouraging her.

It can be seen that interventions can evolve and go beyond a simple conversation, thus giving a new meaning to spiritual care, easing the anxieties of the patient and allowing an improvement in the quality of life. When the team is united and communication flows effectively between professionals, even the simplest practices result in a diversified and individualized approach.

Based on the discourse, the promotion of activities that stimulate happiness, pleasure and satisfaction, alleviate the disabilities that older patients experience during hospitalization. These dynamics allow the growing desire to live and the search for feelings of usefulness and functionality during palliative care.

In DCS 5, it can be inferred that the nursing professionals do not feel prepared to provide spiritual support, describing obstacles such as a lack of time due to the demands of the hospital, not having a private environment for such care, the difficulty of talking about issues religious beliefs, the patient's lack of confidence in the nursing professional, and also because they do not have adequate knowledge or training.

> And you have to have training too, right? I think this is essential because, sometimes, we do not know how to deal with the patient, how to deal with the family. The family member can be very unstable, because for them, maybe it's not well explained or they don't accept the condition of the patient. They are very shaken up. Even though they know it's palliative, they want them to carry out often unnecessary interventions, up to the last moment. There is also the issue of work overburden, which I consider to be the main factor that makes it difficult. Sometimes, you want to provide good care, but due to the large number of patients, you can't provide it as you would like. Nobody accepts death, it makes it very difficult. Today, the professional training for everyone is to take care of those who will survive. You leave college thinking that you are going to save lives. It's pretty complicated. Another thing that I think is difficult is the lack of communication, the lack of dialogue between different professions. I almost can't, for example, talk to the psychologist or the doctor. This is a problem.

During the interview the nurses clarify that the family can interfere with care by not understanding the patient's health status. Therefore, nursing professionals must be able to provide spiritual care for this group, in the context of restrictions such as mourning, the constant search for life and interference in the care provided by the team.

## DISCUSSION

The analysis of the duality between life and death and the clear perception of the proximity of the end of life, results in the emergence of varied, often conflicting, feelings, such as anxiety, grief, fear, peace and acceptance, all perceived in the search and experience of spirituality. Each patient who undergoes palliative care perceives this moment of great complexity in a unique and personal way[13].

Difficulty in dealing with death, attachment to the constant struggle to maintain life, fear and the search for the prevention and relief of pain and suffering are significant aspects in the lives of older patients who are in vulnerable conditions. It is important for patients at this time to highlight feelings such as the relevance of faith and the meaning of life, which can contribute to the relief of various symptoms[14].

The Theory of Transpersonal Caring applies the faith-hope stimulus and correlates it with nursing care to promote patient stability. By respecting the beliefs and limitations of each patient, transpersonal caring is guided beyond human needs and the health recovery process[9]. The inclusion of spiritual care is essential in palliative care, given that family support, love, hope and faith are fundamental characteristics to meet the needs of clients during team interventions[8].

A large part of health practices are still limited in terms of the care of the spiritual dimension. Often due to the lack of skills and abilities of professionals, taking care of aspects that involve body, mind and spirit, remains a great challenge. Thus, it is important to understand the importance of integral care in order to overcome paradigms that can have repercussions on therapy and the entire care process[3].

When considering the assumptions of Transpersonal Human Caring, Jean Watson describes the need to promote incentives that include integral care for families. Thus, such conditions should always permeate spiritual care both for the older patient during the terminal life process, and for the family until the end of the grieving period[15].

The family is one of the most important sources of support for older patients in palliative interventions. It enables and facilitates spiritual care by allowing the team access to the patient's life stories, their beliefs, expectations and reluctances. In this sense, it is up to nursing professionals to promote the inclusion of people who represent an affective bond for the patient, in order to assist in the assistance and contribute to the nurse's performance. These relatives and friends also suffer through the patient's illness and it is the team's role to welcome and mitigate the suffering of all involved[16,17].

One of the central axes presented by the theory of Transpersonal Human Caring, consists of the development of a relationship of help and trust that enriches the individual growth of the nurse and the patient, guaranteeing a relationship without therapeutic impasses which allows the new goals in the care process to be established[15,18].

The performance of nursing professionals in teamwork allows the provision of humanized care to patients and their families. A spiritual approach is not limited to theories and protocols, and it is necessary to promote moments of listening, paying attention to the patient's preferences and providing moments that value their comfort and well-being[14].

It is important to analyze how the treatment of older patients in palliative care is still an obstacle for nursing. In order to build a transpersonal relationship, it is necessary for nurses to disconnect from previously determined principles, and be willing to become involved in comprehensive care. This means that emotional involvement with the patient is essential[9,14].

The process of the finitude of life stimulates several emotional reactions, involving the nursing professional, the patient and the family, as it forces everyone to analyze their finitude. Proposing to the nursing team that their performance can be humanized even in the face of so many vulnerabilities is complex as the academic training of many professionals instructs them to always prioritize the protection and preservation of life, thus leaving them unprepared to deal with death[14].

Due to the difficulty of nurses in addressing spiritual care and the lack of preparation and insertion of this practice in the routine of the nursing team, it is crucial to encourage research on this subject, to work in tandem with care and add new knowledge about palliative care and spirituality.

On a similar note, the limited amount of literature on spirituality and the lack of knowledge of the participants regarding spiritual care were the main factors that limited the research.

## CONCLUSION

The results obtained allow us to understand the perception of nurses on spiritual care in the palliative care process. It was also possible to analyze the perspective of nurses on the meaning and importance of spiritual care in the palliative phase through an integral approach, which is essential to developing practices that in addition to encouraging faith and spirituality, perseverance and expectations about the end of life, allows glimpses of the different aspects of human existence.

The biggest challenge for the research participants was to see that spiritual dimensions should have greater relevance in the daily life of those who provide care and are cared for. Sometimes, what hindered spiritual assistance was the lack of knowledge about concepts such as religiosity and spirituality, the demands of an exhaustive work routine, care centered on the physical-biological aspects, the lack of time for a spiritual approach, the absence of emotional support for the team and even a fragmented professional training that contributed little to the insertion of this practice in palliative care.

Throughout the development of the study, it was seen that family support, moments of listening and the execution of activities that motivate inner peace are significant for nurses. However, dealing with the spirituality of the patient in palliative care reveals aspects that go beyond the care perspective, which is currently focused mainly on pain relief and the promotion of comfort. In view of this, it

is essential for the entire care team to look at the patient holistically, treating the human being in its biopsychosocial and spiritual dimensions.

Thus, a new research proposal on this topic could involve the understanding of other professionals from the multidisciplinary team, in addition to covering other hospital sectors involved in the process, to add and optimize spiritual care in all dimensions of care and identify coping strategies in other contexts.

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Original Articles

1 of 8

# Profile of aggressors of older adults receiving care at a geriatrics and gerontology reference center in the Distrito Federal (Federal District), Brazil

Neuza Moreira de Matos[1] ID
Emanuelle de Oliveira Albernaz[1] ID
Barbara Barbosa de Sousa[1] ID
Mariana Campos Braz[2] ID
Maria Sueli do Vale[3] ID
Hudson Azevedo Pinheiro[4] ID

## Abstract

*Objective:* To profile aggressors of older adults who receive care at a reference center in geriatrics and gerontology in the Distrito Federal (Federal District), Brazil, from 2008 to 2018. *Method:* A retrospective, documentary, descriptive study with a quantitative approach was performed, based on information obtained from the minutes book of the unit, which contained a record of mediation meetings of cases of conflict and violence against older adults, carried out by social workers, nurses and other members of the multidisciplinary team. The data collection instrument covered the sociodemographic characteristics of the aggressor, the sociodemographic and health profile of the older adults and the type of violence suffered. *Result:* 111 cases were analyzed. The children of the older adults were the main aggressors (72%), with a prevalence of men (62%) and the from 51 to 60 year age group (37%). The older adults who suffered violence were predominantly women (72%), almost half of whom were aged 81 to 90 years, followed by those aged 71 to 80 years (39%). A total of 16% of the older adults lived with their children or close family members. The main types of violence evidenced were negligence (56%) and psychological violence (29%), with physical violence representing 8% of cases. *Conclusion:* The study of the profile of the aggressor and the older adult who suffered violence reinforced the need to focus actions within family arrangements. Investigations that address those who practice violence can contribute to the promotion of public health policies and contribute to geriatric and gerontological clinical practices that combat violence against older adults.

[1]    Universidade Católica de Brasília, Departamento de enfermagem. Brasília, DF, Brasil.

[2]    Escola Superior de Ciências da Saúde/Fundação de Ensino e Pesquisa em Ciências da Saúde, Pós-graduação em Saúde do Adulto e do Idoso. Brasília, DF, Brasil.

[3]    Secretaria de Estado da Saúde do Distrito Federal, Departamento Departamento de Geriatria e Gerontologia. Brasília, DF, Brasil.

[4]    Centro Universitário EuroAmericano de Brasília (UniEuro), Departamento de Fisioterapia. Brasília, DF, Brasil.

Correspondence
Neuza Moreira de Matos.
dudineuza@gmail.com

## INTRODUCTION

Following the achieving of longer life spans in both developed and developing countries, new challenges have emerged concomitant to this scenario. Such a reality stems from the changes caused by aging, which result in the progressive decline of independence and may produce certain physical and/or cognitive limitations that lead older individuals to experience social vulnerabilities[1].

Violence against older adults has become a serious public health problem that has become increasingly visible in research over the last two decades, especially in the agendas of national and international organizations[2]. According to the World Health Organization[3], the violation of the rights of older adults is defined as: "a single or repeated act, or lack of appropriate action, which impairs the physical and emotional integrity of older adults, impeding the performance of their social role".

Violence against older adults is also associated with high mortality rates, physical illness, malnutrition, psychosomatic diseases and suicide attempts, impacting the quality of life of such adults and leading to reduced functionality[1,4]. Minayo[2] classifies violence against this population as physical, psychological, sexual or financial, or taking the form of abandonment, neglect and self-neglect.

The family is the main source of care for the older adults, and so its inadequacy is closely related to situations of violence and conflicting interactions. In Brazil, 28% of households contain at least one older adult, while 90% of such adults live with close family members[2,4].

Intra-family violence is usually underreported and originates mainly from socioeconomic problems, difficulties related to the onset of diseases and a lack of knowledge about old age and care. Conflict can begin with difficult situations associated with a lack of preparedness to deal with the reality encountered[4].

Non-legal conflict mediation is an effective strategy that utilizes clear communication and active listening to seek family reorganization, foster understanding and recognition among family members/caregivers, and establish agreements and prevent new conflicts. The conduct of the mediator must be performed impartially and based on specific knowledge. Thus, professional training is one of the requirements of the health team[5].

Knowledge of the characteristics of the aggressors provides insight for the implementation of interventions. Scientific studies about the figure of the aggressor are incipient, however. The present study therefore aimed to outline the profile of such aggressors, as well as the types of violence suffered by older adults receiving care at a reference center in geriatric and gerontological care in the Federal District (Distrito Federal), Brazil.

## METHOD

A retrospective, documentary-descriptive study with a quantitative approach was carried out, based on information gathered from a minutes book, which contains reports of family meetings for the mediation of conflict and cases of violence against older adults receiving care at a reference centre in geriatric and gerontological care in the Federal District, Brazil. This reference center has a multidisciplinary and interdisciplinary team specialized in caring for older adults, and is the only such reference center for this population group in the city.

Family meetings took place once a week, conducted by at least two staff health professionals, a social worker and a nurse. The minutes of the meetings were usually taken by the social worker.

All the minutes of the meetings from 2008 to 2018 were analyzed by three trained researchers. The inclusion criteria used were cases involving individuals who received care at the reference unit, who were 60 years or older, and which were recorded in the minutes of the conflict mediation meetings. Five cases were excluded as they did not involve violence and/or were related to the care of individuals under 60 years of age, giving a total of 111 cases in the sample.

Regarding the characterization of the aggressor, variables such as age, gender, type of relationship or degree of relationship with the older adults and history of alcohol and/or illicit drug abuse were analyzed. For the older victims of violence, data on age, gender,

living arrangement, monthly income, comorbidities and types of violence suffered were analyzed.

The determination of the type of violence followed the concepts and characterizations defined by Minayo[2], categorized in this work as: physical, psychological, sexual, financial, abandonment, neglect and self-neglect.

For data analysis, statistical software was used and descriptive statistical analysis of the data related to the characterization of the sample was performed.

This study was approved by the Ethics Committee of the Fundação de Ensino e Pesquisa em Ciências da Saúde (the Health Sciences Teaching and Research Foundation) (FEPECS) under Protocol No. 1.798.579, October 29, 2016.

## RESULTS

A total of 111 cases registered in the minutes book were analyzed. Over the ten year period of the study, there was a reduction in the number of occurrences of violence identified in the unit, as follows: 2008 - 21 cases, 2009 - 12 cases, 2010 - 8 cases, 2011 - 15 cases, 2012 - 14 cases, 2013 - 11 cases, 2014 - 13 cases. It should be noted that between 2015 and 2018 there were periods when there was a lack of qualified professionals (social workers) to conduct the meetings, and thus, between 2015 and 2016 there were only five cases recorded each year, in 2017 only four cases and in 2018, three cases.

The children of the older adults were the main aggressors identified, representing 72% of the total, and within this group, the male gender was the most prevalent (39%). Informal caregivers of the older adults made up 14.5% of the aggressors (Figure 1). In terms of gender, 62% of the aggressors were male and 38% female.

Regarding the age of the aggressor, there was a predominance of those aged 51 to 60 years (37%), while 30% of the sample were aged between 41 to 50 years, and 5% of the aggressors were 60 years or older (Figure 2). The frequent reported use of illicit drugs and/or alcohol corresponded to 5%.

Regarding the ages of the older adults who were victims of violence, 45% were between 81 and 90 years old, followed by those between 71 and 80 years old (39%). A total of 11% were between 60 and 70 years old and 5% were nonagenarians or older. In the evaluation of living arrangements, half of the older adults lived in their own home and 16% lived with close family members.
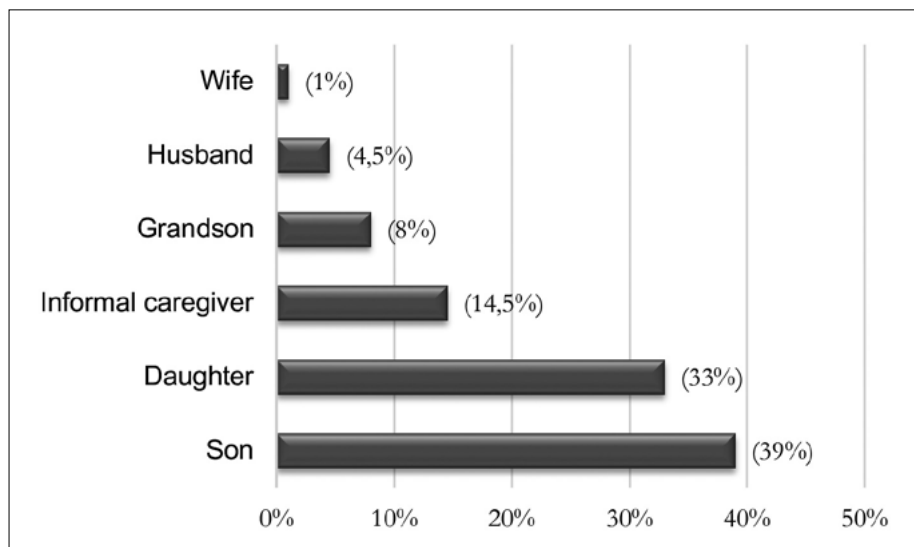


**Figure 1.** Identification of aggressors of older adults people treated at a geriatrics and gerontology reference center in the Federal District (N=111). Brasília, 2019.
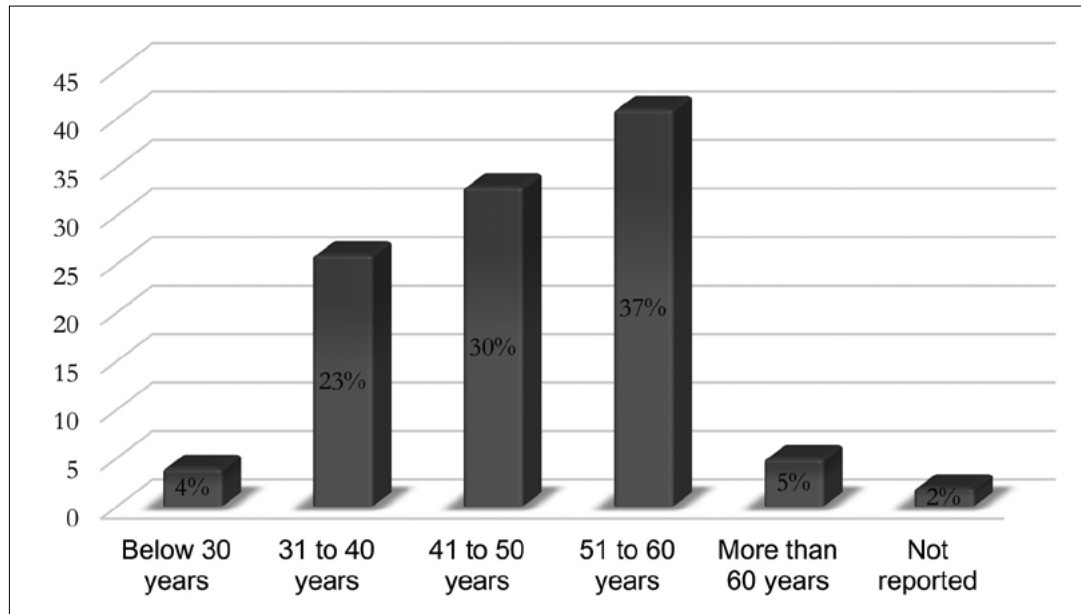
**Figure 2.** Age groups of aggressors of older adults treated at a geriatrics and gerontology reference center in the Federal District (N=111). Brasília, 2019.

Of the older adults evaluated, 72% were women and 28% were men. The predominant monthly income was equal to the minimum wage (46%), while 25% received twice the minimum wage or more and 31% of the individuals studied did not report the level of their income. Regarding comorbidities, 54% of the older adults had dementia while of these, 32% of individuals involved with the provision of care were unaware of the symptoms of the disease. In addition, 31% of the older adults had systemic arterial hypertension (SAH) and 13% had diabetes mellitus-associated diseases (DM).

Regarding the type of violence suffered, Figure 3 shows the most prevalent was neglect (56%), followed by psychological violence, which made up 29% of the sample. The occurrence of neglect combined with abandonment was present in 21% of the analyzed cases, due to the significance of this result, this variable was established. Physical Violence occurred in 8% of reports. There were no reports of sexual violence and self-neglect in this study.

In the present study the terms neglect and abandonment (combined) were used for cases where the older adults were neglected by their children at one time and totally abandoned at another time during their lives, i.e., they suffered both types of violence, or for cases where the older adults were neglected by one of their children and abandoned by others.
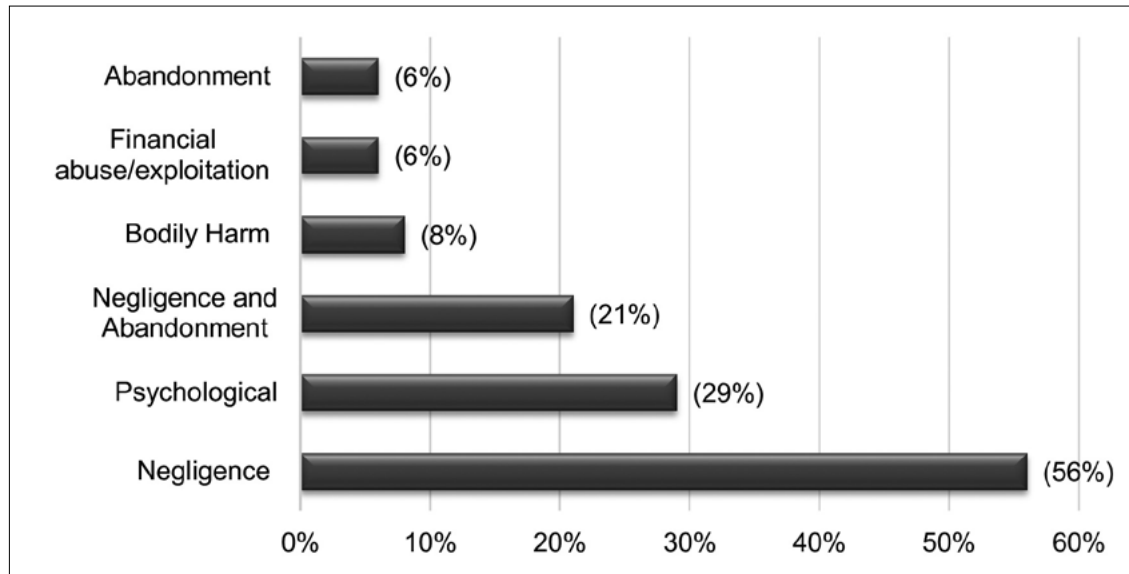
**Figure 3.** Types of violence against older adults observed at a geriatrics and gerontology reference center in the Federal District (N=111). Brasília, 2019.

## DISCUSSION

The profile of the aggressors in the present study revealed that a large proportion, representing 72% of the sample, was composed of the children of the older adults, corroborating another Brazilian study, in which more than half of the aggressors of older adults were their own children[6]. Gender specificity was also observed as an important finding, as more than half of the aggressors were male and 39% were between 51 and 60 years old. Regarding the type of violence practiced, there was a greater prevalence of neglect and psychological violence.

Changes in family dynamics, resulting from the new cultural and social aspects found in society, are realities that result from population aging and raise questions, through researchers, of our understanding of their influences on family relationships of violence[7,8].

Research on current family arrangements provides information that can focus actions and foster policies directed towards the social reality, as it is within families that decisions are made about the provision of income, caring for dependents and establishing support networks[9].

Regarding gender issues, male aggressors were predominant (62%), which corroborates other recent investigations[10,11]. On the other hand, older women were the most frequent victims (72%) in this study. This reality may be related to the feminization of old age, in which women have a higher life expectancy. Consequently, there is an increase in the prevalence of chronic diseases and higher functional dependence than in men[12].

Gender violence is an ancient phenomenon, produced from social, cultural, political and historical constructions, which can be inserted into the daily life of women from childhood, adulthood and old age[13]. In Brazil, despite advances in public policies and punitive laws, exorbitant levels of such violence remain[13,14].

The fact of living in the same household, according to Minayo[2], is a factor that favors the occurrence of violence between the aggressor and the older adult. In this survey, 16% of the older adults lived with children or close family members. Financial dependence, whether from the older adults to the caregiver, or the other way around, is a frequent condition that leads to living in the same home and intrafamily violence[4,10].

In this investigation, 46% of the older adults earned minimum salary, which indicates probable financial dependence on family members. In contrast, a study by Silva and Dias[4] that sought to understand the motivations that drove aggressors to violence from the perspective of the perpetrators themselves, identified the financial dependence of the aggressor on the older adults as one of the main causes.

Alcohol abuse is also a frequent cause of violence, increasing the risk of occurrence by up to three times[15]. In this present study, the frequent use of illicit drugs and/or alcohol by the aggressor was present in 5% of cases, highlighting the importance of strengthening the support network and efficient strategies to tackle addiction.

Another risk factor for violence is the existence of dementia in the older adults[16], quadrupling the rate of incidence when compared to non-suffering older adults[15]. In this study, more than half of the sample (54%) had some type of dementia and 32% of the caregivers were unaware of the symptoms. Behavioral changes resulting from dementia are common and often involve violent acts by patients. The provision of support and information from health professionals about the characteristics of the dementia process and how to deal with certain situations are therefore essential in such situations[17].

A five year study conducted in the city of São Paulo found a predominance of victims of violence aged 60-65 years (46.30%), while in another survey 72% of the sample was between 60 and 70 years[10,18]. In the present study, meanwhile, there was a predominance of the older age group, with almost half of the sample aged between 81 to 90 years old. This is probably due to the fact that the study was based on a secondary reference center for the older adults, which in turn receives a large number of long-lived individuals, with more specific pathologies, which are often in advanced stages.

The increased demand for care therefore requires greater dedication and the adaptation of the intra-home support network. Failure to reorganize this may result in the violation of the rights of the older adults, thus characterizing violence by negligence[2,10].

Neglect was the main type of violence reported in this study (56%) and is classified as passive when there is a lack of care related to the safety of the home environment, skin lesions and dehydration. In contrast, active negligence is described as the intentional deprivation of the basic needs of older adults, such as hygiene, food and health care[1].

Situations in which the older adult is deprived of coming and going, removed from their home or institutionalized against their will is characterized as violence by abandonment[2]. It was observed that in 21% of the registered cases there was abandonment associated with violence due to negligence.

Psychological violence was identified in 29% of cases and is defined as attitudes of contempt, contempt, prejudice and discrimination against older adults[1,2]. A study of almost 350 older adults identified psychological violence as the most prevalent, representing 43% of cases, while physical violence was at a similar level to the present study, with 9%[19].

The occurrence of psychological violence is often confused with the exhaustion and burden of the interpersonal relationships between the older adult and the caregiver. In general, abuse is committed discretely, may occur daily and be interpreted by those involved as a common pattern of the relationship.[15].

Underreporting is still an issue in such studies, with an estimated five missing cases for every one notified, with the main reasons including fear of institutionalization among the older adults, the belief that impatience and aggression are justifiable due to the great need for care and especially due to respect for the family ties between the perpetrator and the victim[10,20].

In this context, studies have indicated that public policies created as mechanisms to protect this population segment, such as the National Older Adult Policy and the Older Adult Statute, remain ineffective, with a lack of efficiency and continuity, while mechanisms of denunciation remain incipient and there is a lack of awareness about aging among the public, resulting in the gradual increase in underreporting of cases of violence[9].

The loss in sample data from the last four years of the survey was a limitation of the study, caused

by the frequent unavailability of social workers in the unit to conduct the meetings.

## CONCLUSION

When identifying the profile of the aggressor, it was observed that in most cases there was a family bond between the victim and the perpetrator, even those who did not live in the same home as the older adults. Most aggressors were the children of the older adults, were predominantly male and were over 50 years old.

The profile of the older victims of violence in this study was that of a long-lived woman with an income of up to the minimum wage, with dementia and/ or other comorbidities, whose family caregiver was unaware of the pathologies in this phase of old age.

Regarding the type of violence suffered by the older adults, there was a higher prevalence of neglect, followed by psychological violence and the combination of neglect and abandonment. Physical violence and/or financial abuse occurred in less than 15% of the registered cases.

It is important to train health professionals to detect and notify cases of violence, and to actively seek out older victims of abuse, aimed at stopping such violent practices, including in their more subtle forms, when they are interpreted as an acceptable relationship pattern. In primary or specialized health care, establishing a bond and commitment to the older population receiving care can support prevention and early intervention in cases of violence against older adults.

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Original Articles

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# Functional Dependence among older adults receiving care from Family Health Strategy teams

Mariano Fagundes Neto Soares[1] ID
Luciana Colares Maia[2] ID
Simone de Melo Costa[3] ID
Antônio Prates Caldeira[4] ID

## Abstract

*Objective:* To evaluate functional dependence among older adults receiving care from Family Health Strategy (FHS) teams, in Montes Claros, Minas Gerais, Brazil, identifying associated factors. *Methods:* A cross-sectional and analytical study with randomly selected older adults was performed. The instrument used was BOMFAQ (the Brazilian Older Americans Resources and Services Multidimensional Functional Assessment Questionnaire). Data collection was performed by trained staff in the homes of the older adults. Sociodemographic, economic data, living habits, health care, morbidities and Activities of Daily Living (ADL) were evaluated. In addition to descriptive analysis, factors associated with functional dependence were identified using the chi-square test, followed by hierarchical multiple analysis using Poisson regression with robust variance. *Results:* 1,750 older adults were evaluated. The group was predominantly female, with low schooling. The proportion of the sample considered dependent was 57.0%. The variables associated with functional dependence were: female gender (PR=1.19); age ≥70 years (PR=1.33); schooling ≤4 years (PR=1.19); being unemployed (PR=1.43); not performing physical activity (PR=1.19) or walking (PR=1.15); not listening to the radio as a leisure activity (PR=1.13); not having the habit of reading (PR=1.17); presenting depressive symptoms (PR=1.15); hospitalization in the last six months (PR=1.18); cognitive impairment (PR=1.16); insomnia (PR=1.13); obesity (PR=1.18); falls in the

[1] Universidade Estadual de Montes Claros, Departamento de Saúde Mental e Coletiva, Centro de Ciências Biológicas e da Saúde. Montes Claros, MG, Brasil.

[2] Universidade Estadual de Montes Claros, Departamento de Clínica Médica, Centro de Ciências Biológicas e da Saúde. Montes Claros, MG, Brasil.

[3] Universidade Estadual de Montes Claros, Departamento de Odontologia, Centro de Ciências Biológicas e da Saúde. Montes Claros, MG, Brasil.

[4] Universidade Estadual de Montes Claros, Departamento de Odontologia, Centro de Saúde da Mulher e da Criança, Centro de Ciências Biológicas e da Saúde. Montes Claros, MG, Brasil.

Correspondence
Antônio Prates Caldeira
antonio.caldeira@unimontes.br

last year (PR=1.11); cataracts (PR=1.09), spinal problems (PR=1.19); urinary incontinence (PR=1.25); poor circulation (PR=1.09) and a negative self-perception of health (PR=1.22).
*Conclusion:* Functional dependence is multifactorial, but is influenced mainly by the health conditions of older adults.

## INTRODUCTION

The rapid demographic transition observed in Brazil and around the world creates challenges for public health services, as it increases the demand for care aimed at older adults[1,2]. This population group tends to have a higher prevalence of chronic-degenerative diseases, neoplasms and functional losses[3]. The ability to perform activities of daily living (ADLs) is the greatest indicator of functionality among older adults, as it is based on being able to carry out actions required in daily life without help[4]. Activities of daily living involve organic, mental and psychosocial functions. They reflect normal patterns and are commonly divided into basic activities of daily living (BADLs) and instrumental activities of daily living (IADLs)[5].

A state of full functionality or independence for an older adult is influenced by chronic diseases and morbidities inherent to age, but also by physical, cultural, technological and legal environmental barriers[6]. Functionality assessment aims to detect risk conditions, identify demands and the need to use secondary services, and define connections for broad and multidimensional care for older adults. This process allows for an adequate clinical diagnosis that can guide decisions about comprehensive care for the individual.

Functional limitations for older adults should be considered the most important indicator of vulnerability and, therefore, should be the focus of interventions by any professional and/or team responsible for their care. Health professionals, in teams with resolutive capacity, must develop lines of care for older adults, focusing on health promotion and prevention and developing a hierarchical model of care, based on the functional losses that occur frequently over the years[7,8]. In this sense, it is essential that Family Health Strategy (FHS) teams seek to understand the functionality profile of the older population under their care.

Once a loss of functionality is perceived, it is possible for the health team to develop effective and early interventions, allowing older adults and their families to maintain a satisfactory quality of life. Considering the lack of studies on the theme for the northern region of Minas Gerais and the need to raise awareness among FHS teams about the need for training in this area, the present study aimed to assess the functional dependence of older adults receiving care from FHS teams, in a hub city in the region, and also to identify the factors associated with such a condition.

## METHOD

This study is part of a research project that evaluates the matriculation process, carried out by a team of specialists in health care for older adults receiving care from Family Health Strategy (FHS) teams. The study was observational, transversal and analytical in nature. It was conducted in Montes Claros, in the north of the state of Minas Gerais, which is the main urban hub of the region.

To determine the sample size, an estimated population of 33,930 older adults (8.2% of the total population of the city) was considered, along with a frequency of 50% of older adults with some level of functional impairment (considered to be a conservative frequency, which produces a larger sample number[9]), a 95% confidence level and a sampling error margin of 3%. The sampling process was carried out by clusters in two stages. Initially, regional health centers were drawn, followed by at each center, FHS teams and their respective coverage areas. For each territory, the micro-areas defined in the process of territorialization of the health teams were drawn, within which all the older adults were considered eligible for the study. The minimum calculated sample size was 1,035 individuals. This value was multiplied by a correction factor for the design effect ("deff") equal to 1.5 and increased by

10% for eventual losses, which defined a minimum of 1,708 older adults to be evaluated.

The data collection process, carried out between February and October 2017, involved a specially trained team, composed of medical students and nurses. Prior to the beginning of the study, a pilot study was conducted in an area other than those selected for the research, for the final calibration of the team (Kappa Index >0.8 for most of the items measured), the data of which were not included in the final work. The questionnaire was applied at the home of the older adults.

All the older adults registered with the FHS teams from the selected micro-areas were considered eligible for the study. Older adults who were unable to answer questionnaires and who did not have a caregiver/guardian available during visits were also excluded. Older individuals who were not present at home after at least three visits, on different days and at different times, even after prior appointments, were considered losses.

Data collection was performed using the Brazilian Older Americans Resources and Services Multidimensional Function Assessment Questionnaire (BOMFAQ). This instrument is a version of the Older Americans Resources and Services (OAR) and consists of a multidimensional assessment of older adults adapted and validated in Brazil[10]. The instrument includes, in addition to functional capacity, sociodemographic data and an assessment of physical and mental health through the Mini Mental State Examination (MMSE) and the Psychogeriatric Tracking Questionnaire (PRT), as well as information on social integration.

Especially in terms of functionality, BOMFAQ evaluates ADLs, investigating the degree of difficulty described in the performance of fifteen daily activities, of which eight are classified as BADLs (lying down/getting up, eating, combing hair, walking on a level surface, showering, dressing, going to the bathroom in time and cutting toenails) and seven are considered IADLs (climbing a flight of stairs, taking medication at the correct time, walking close to home, shopping, preparing meals, going out and cleaning the house).

The existence of difficulty or dependence in carrying out each of these activities was identified according to the BOMFAQ questionnaire. The sum of the difficulties comprised the value of this discrete quantitative variable, with a higher value representing greater impairment, in accordance with the following criterion: no difficulty or independent; difficulty in one to three activities: mild dependence; difficulty in four to six activities: moderate dependency; and difficulty in seven or more activities: severe dependence. To assess the factors associated with functional dependence, the variable was dichotomized into *dependent* (one or more difficulties) and *independent* (no difficulty).

The following independent variables were evaluated: sex (male x female), age (<70 years x ≥70 years), marital status (married/stable union x single/widowed/separated), education (≤4 years x >4 years), currently working (yes x no), family income (≤1 minimum wage x >1 minimum wage) regular physical activity (yes x no), smoking (yes x no), habit of walking (yes x no), dancing ( yes x no), playing sports (yes x no), watching television (yes x no), listening to the radio (yes x no) and reading (yes x no). Data on self-reported morbidities was also collected (rheumatism, asthma or bronchitis, high blood pressure, poor circulation, diabetes, obesity, cataracts, urinary incontinence, insomnia, back problems and osteoporosis), along with self-perceived health (positive x negative), records of falls in the last year (yes x no), and hospitalization in the last six months (yes x no).

Cognitive impairment assessed by the Mini Mental State Examination and its categorization (with cognitive impairment x without cognitive impairment) was carried out based on the respondent's level of schooling. Thus, cognitive impairment was considered present for people with no schooling with a final score <13 points, for people with between one and eight years of schooling with a final score <18 points and for those with eight or more years of schooling, with a score <26 points. Depressive symptoms, according to the Psychogeriatric Screening Questionnaire, were considered present when the questionnaire reached a final score equal to or greater than six points.

For data analysis, descriptive statistics were initially applied, followed by bivariate analysis, using the chi-square test. Variables that were associated up to the level of 20% in the bivariate analysis were evaluated in a hierarchical model using Poisson Regression, with robust variance, to obtain the prevalence ratios (PR) and adjusted confidence intervals (95% CI). The quality of the adjustment was assessed by analyzing the deviance and likelihood ratio. For the composition of the hierarchical model, the sequence described in Figure 1 was adopted.

**Figure 1.** Model for multiple hierarchical analysis of factors associated with impaired functionality in older adults. Montes Claros, Minas Gerais, 2018.

All ethical aspects were respected in this study. The participants and their companions were duly informed about the research and agreed to participate by signing an Informed Consent Form (ICF). Fingerprints were collected for those who could not sign. The anonymity and confidentiality of all the information provided were guaranteed, and the data were used exclusively for the purposes of the study. The research project was approved by the Research Ethics Committee of the Universidade Estadual de Montes Claros (Unimontes), under decision nº 1.628.652.

## RESULTS

A total of 1,750 older adults aged 60 to 107 years were evaluated. There was a predominance of the 60 to 69 years age group (48.6%). The female sex represented 63.4% of the interviews. The majority declared their skin color black or brown (62.8%). Most of the older adults had not reached high school (88.5%), and 11.5% declared themselves illiterate. In relation to lifestyle, regular physical activity was described by a third of the older adults (33.3%) and the most mentioned leisure activities were watching television and listening to the radio. These and other characteristics of the group are shown in Table 1.

The largest proportion of the population surveyed in this study was considered dependent in the performance of at least one ADL (57.0%). The proportion of mild, moderate and severe dependence was 26.5%, 12.4% and 18.1%, respectively.

Table 2 shows the distribution of the evaluated activities and the level of difficulty recorded for each.

The most impaired BADLs were *cutting toenails* and *lying down/getting out of bed*. The main impaired IADLs were *climbing stairs* and *cleaning the house*.

Tables 3 and 4 show the results of the crude (bivariate) and adjusted analysis for the factors associated with functional dependence, with Table 3 including sociodemographic variables and lifestyle habits and Table 4 including variables related to health conditions. The variables that were found to be statistically associated with some level of functional dependence after multiple analysis were: the female sex (PR=1.19; 95% CI=1.08-1.31); age 70 years or older (PR=1.33; 95% CI=1.22-1.45); schooling equal to or less than four years (PR=1.19; 95% CI=1.08-1.31); not currently working (PR=1.43; 95% CI=1.11-1.85); not performing regular physical activity (PR=1.19; 95% CI=1.05-1.34); not taking walks (PR=1.15; 95% CI=1.01-1.31); not listening to the radio as a pastime (PR=1.13; 95% CI=1.05-1.22); not having the habit of reading (PR=1.17; CI95%=1.07-1.28); presenting depressive symptoms (PR=1.15; 95% CI=1.03-1.29); having a record of at least one hospitalization in the previous six months (PR=1.18; 95% CI=1.09-1.26); suffer cognitive impairment (PR=1.16; 95% CI=1.09-1.25); reported insomnia (PR=1.13; 95% CI=1.04-1.22); obesity (PR=1.18; 95% CI=1.09-1.29); having a fall recorded in the previous year (PR=1.11; 95% CI=1.04-1.20); cataracts (PR=1.09; 95% CI=1.01-1.18), spinal problems (PR=1.19; 95% CI=1.09-1.30); urinary incontinence (PR=1.25; 95% CI=1.16-1.36); poor circulation (PR=1.09; 95% CI=1.01-1.18) and having a negative self-perception of health (PR=1.22; CI95%=1.16-1.28).

**Table 1.** Characterization of older adults assisted by Family Health Strategy teams. Montes Claros, Minas Gerais, 2018.

| Variables | n (%) | %* |
|---|---|---|
| **Sex** | | |
| Male | 641 (36.6) | 36.6 |
| Feminine | 1109 (63.4) | 63.4 |
| **Ethnicity/color** | | |
| White | 630 (36.0) | 36.0 |
| Black | 219 (12.5) | 12.5 |
| Mixed-race | 879 (50.2) | 50.3 |
| Yellow (Asian-Brazilian)/Indigenous | 21 (1.2) | 1.2 |
| **Age (years)** | | |
| 60 – 69 | 851 (48.6) | 48.6 |
| 70 – 79 | 569 (32.5) | 32.5 |
| 80 – 107 | 330 (18.9) | 18.9 |
| **Education** | | |
| Illiterate | 201 (11.5) | 11.5 |
| 1 - 3 years (Can read/write or incomplete primary) | 587 (33.5) | 33.6 |
| 4 years (complete primary) | 407 (23.3) | 23.3 |
| 5 - 8 years (primary II) | 230 (13.2) | 13.3 |
| > 9 years (high school or higher) | 324 (18.5) | 18.5 |
| **Marital status** | | |
| Not married | 159 (9.1) | 9.1 |
| Married | 911 (52.1) | 52.1 |
| Civil partnership | 34 (1.9) | 1.9 |
| Divorced/separated | 152 (8.7) | 8.7 |
| Widower | 493 (28.2) | 28.2 |
| **Family income (minimum wage multiplier)** | | |
| ≤ 1.0 | 428 (25.9) | 25.9 |
| 1.1 - 3.0 | 893 (54.1) | 54.1 |
| 3.1 to 5.0 | 216 (13.1) | 13.1 |
| > 5.0 | 114 (6.9) | 6.9 |
| **Lifestyle Features** | | |
| Regular Physical Activity | 582 (33.3) | 33.3 |
| Current smoker | 131 (7.5) | 7.5 |
| Past smoker | 606 (34.7) | 34.7 |
| **Leisure activities**\*\* | | |
| Crafts | 744 (43.1) | 43.1 |
| Watch TV | 1468 (7.5) | 84.2 |
| Listen to Radio | 979 (56.2) | 56.2 |
| Reading | 820 (47.2) | 47.2 |
| To dance | 167 (9.6) | 9.6 |
| Play sports | 78 (4.5) | 4.5 |

*Percentage weighted by the sample weight; **The sum of the percentages is greater than 100% because the instrument allows more than one activity to be recorded.

**Table 2.** Level of difficulty in performing activities of daily living among older adults cared for by Family Health Strategy teams. Montes Claros, Minas Gerais, 2018.

| Activities of Daily Living | Great difficulty n (%) | Little difficulty n (%) | No difficulty n (%) |
|---|---|---|---|
| Basic Activities | | | |
| Lie down on/get up from bed | 144 (8.2) | 273 (15.6) | 1332 (76.1) |
| Eat | 48 (2.7) | 71 (4.1) | 1630 (93.2) |
| Brush hair | 65 (3.7) | 85 (4.9) | 1599 (91.4) |
| Walking on level surface | 134 (7.7) | 173 (9.9) | 1442 (82.4) |
| Take a bath | 118 (6.7) | 87 (5.0) | 1544 (88.2) |
| Dress up | 98 (5.6) | 124 (7.1) | 1527 (87.3) |
| Go to bathroom in time | 94 (5.4) | 129 (7.4) | 1526 (87.2) |
| Instrumental activities | | | |
| Cut toenails | 422 (24.1) | 243 (13.9) | 1053 (60.2) |
| Climb Stairs | 312 (17.8) | 330 (18.9) | 1107 (63.3) |
| Take medication at correct time | 174 (9.9) | 161 (9.2) | 1414 (80.8) |
| Walk near home | 210 (12.0) | 131 (7.5) | 1408 (80.5) |
| Shopping | 276 (15.8) | 98 (5.6) | 1371 (78.3) |
| Preparing Meals | 230 (13.1) | 73 (4.2) | 1422 (81.3) |
| Drive | 280 (16.0) | 149 (8.5) | 1315 (75.1) |
| Clean the house | 364 (20.8) | 215 (12.3) | 1142 (65.3) |

**Table 3.** Crude and adjusted analyzes of the associations between sociodemographic variables and life habits and dependence for activities of daily living (ADLs) among older adults cared for by Family Health Strategy teams. Montes Claros, Minas Gerais, 2018.

| Variables | Dependent n (%) | Independent n (%) | $p$-value | Crude PR(CI$_{95\%}$) | Adjusted PR(CI$_{95\%}$) [**] |
|---|---|---|---|---|---|
| Sociodemographic variables | | | | | |
| Sex | | | < 0.001 | | |
| Female | 680 (61.4) | 428 (38.6) | | 1.24(1.13-1.35) | 1,19 (1,08-1,31) |
| Male | 318 (49.6) | 323 (50.4) | | 1 | 1 |
| Age range (years) | | | <0.001 | | |
| ≥ 70 | 599 (66.6) | 300 (33.4) | | 1.42(1.30-1.55) | 1,33 (1,22-1,45) |
| < 70 | 399 (46.9) | 451 (53.1) | | 1 | 1 |
| Schooling (years) | | | <0.001 | | |
| ≤ 4 | 733 (61.3) | 462 (38.7) | | 1.31(1.19-1.45) | 1,19 (1,08-1,31) |
| > 4 | 259 (46.8) | 295 (53.2) | | 1 | 1 |
| Marital Status | | | <0.001 | | |
| Widowed/unmarried | 510 (63.4) | 295 (36.6) | | 1.23(1.13-1.33) | * |
| married/civil partnership | 488 (51.7) | 456 (48.3) | | 1 | |
| Family Income (minimum salaries) | | | 0.82 | | |
| ≤ 1 | 260 (60.7) | 168 (39.3) | | 1.08(0.99-1.19) | * |
| > 1 | 738 (55.9) | 583 (44.1) | | 1 | |

Continuation of Table 3

| Variables | Dependent n (%) | Independent n (%) | p-value | Crude PR(CI₉₅%) | Adjusted PR(CI₉₅%) ** |
|---|---|---|---|---|---|
| Currently working | | | <0.001 | | |
| No | 957 (58.7) | 672 (41.3) | | 1.71(1.34-2.21) | 1,43(1,11-1,85) |
| Yes | 41 (34.2) | 79 (65.8) | | 1 | 1 |
| Life habits | | | | | |
| Perform regular physical activity | | | <0.001 | | |
| No | 737 (63.3) | 427 (36.7) | | 1.42(1.28-1.57) | 1,19 (1,05-1,34) |
| Yes | 260 (44.7) | 322 (55.3) | | 1 | 1 |
| Go walking as a pastime | | | <0.001 | | |
| No | 778 (62.7) | 463 (37.3) | | 1.44(1.29-1.60) | 1,15 (1,01-1,31) |
| Yes | 215 (43.5) | 279 (56.5) | | 1 | 1 |
| Dance as a pastime | | | 0.007 | | |
| No | 916 (58.4) | 653 (41.6) | | 1.23(1.05-1.47) | * |
| Yes | 79 (47.4) | 88 (52.7) | | 1 | |
| Listen to the radio as a pastime | | | <0.001 | | |
| No | 478 (62.7) | 284 (37.3) | | 1.19(1.10-1.29) | 1,13 (1,05-1,22) |
| Yes | 520 (52.7) | 467 (47.3) | | 1 | 1 |
| Read as a pastime | | | | | |
| No | 582 (63.4) | 336 (33.6) | | 1.27(1.16-1.38) | 1,17(1,07-1,28) |
| Yes | 416 (50.1) | 415 (49.9) | | 1 | 1 |
| Practice sports as a pastime | | | <0.001 | | |
| No | 962 (58.1) | 693 (41.9) | | 1.52(1.17-1.97) | * |
| Yes | 36 (38.3) | 58 (61.7) | | 1 | |
| Watch TV as a pastime | | | 0.79 | | |
| No | 160 (58.0) | 166 (42.0) | | 1.02(0.91-1.14) | * |
| Yes | 838 (56.9) | 635 (43.1) | | 1 | |
| Current smoker | | | 0.85 | | |
| Yes | 73 (56.2) | 57 (43.8) | | 0.98(0.83-1.15) | * |
| No | 925 (57.1) | 694 (52.9) | | 1 | |

* Excluded after adjustment with other variables (without statistical significance); **Likelihood ratio (Omnibus test): p<0.001.

**Table 4.** Crude and adjusted analyzes of the associations between variables related to health conditions with dependence for activities of daily living (ADLs) among older adults assisted by Family Health Strategy teams. Montes Claros, Minas Gerais, 2018.

| Variables | Dependent n (%) | Independent n (%) | p-value | Crude PR (CI₉₅%) | Adjusted PR(CI₉₅%) *** |
|---|---|---|---|---|---|
| Depressive Symptoms ** | | | <0.001 | | |
| Yes | 97 (78.2) | 27 (21.8) | | 1.41(1.27-1.56) | 1.15(1.03-1.29) |
| No | 901 (55.4) | 724 (44.6) | | 1.00 | 1.00 |
| Hospitalizations in the last 6 months | | | <0.001 | | |
| Yes | 99 (81.8) | 22 (18.2) | | 1.49(1.35-1.63) | 1.18(1.09-1.26) |
| No | 899 (55.2) | 729 (44.8) | | 1.00 | 1.00 |

Continuation of Table 4

| Variables | Dependent n (%) | Independent n (%) | p-value | Crude PR (CI$_{95\%}$) | Adjusted PR(CI$_{95\%}$) *** |
|---|---|---|---|---|---|
| Cognition impairment (Mini-mental) *** | | | <0.001 | | |
| Yes | 161 (80.1) | 40 (19.9) | | 1.48(1.36-1.61) | 1.16(1.09-1.25) |
| No | 837 (54.1) | 711 (45.9) | | 1.00 | 1.00 |
| High blood pressure | | | <0.001 | | |
| Yes | 752 (60.7) | 486 (39.3) | | 1.26(1.14-1.39) | * |
| No | 246 (48.1) | 265 (51.9) | | 1.00 | |
| Diabetes | | | 0.002 | | |
| Yes | 232 (64.1) | 130 (35.9) | | 1.16(1.06-1.27) | * |
| No | 766 (55.2) | 621 (44.8) | | 1.00 | |
| Insomnia | | | <0.001 | | |
| Yes | 377 (62.6) | 142 (27.4) | | 1.44(1.33-1.55) | 1.13(1.04-1.22) |
| No | 621 (50.5) | 609 (49.5) | | 1.00 | 1.00 |
| Obesity | | | <0.001 | | |
| Yes | 227 (68.8) | 103 (31.2) | | 1.27(1.16-1.38) | 1.18(1.09-1.29) |
| No | 771 (54.3) | 648 (45.7) | | 1.00 | 1 |
| Falls in the last year | | | <0.001 | | |
| One or more | 369 (69.1) | 165 (30.9) | | 1.33(1.23-1.44) | 1.11(1.04-1.20) |
| None | 629 (51.8) | 586 (48.2) | | 1.00 | 1.00 |
| Asthma and Bronchitis | | | 0.160 | | |
| Yes | 92 (62.6) | 55 (37.4) | | 1.10(0.97-1.26) | * |
| No | 906 (56.6) | 696 (43.4) | | 1.00 | |
| Cataract | | | <0.001 | | |
| Yes | 286 (71.3) | 115 (28.7) | | 1.35(1.25-1.46) | 1.09 (1.01-1.18) |
| No | 712 (52.8) | 636 (47.2) | | 1.00 | 1.00 |
| Spine problems | | | <0.001 | | |
| Yes | 551 (68.2) | 257 (31.8) | | 1.44(1.32-1.56) | 1.19 (1.09-1.30) |
| No | 447 (47.5) | 494 (52.5) | | 1.00 | 1.00 |
| Urinary incontinence | | | <0.001 | | |
| Yes | 256 (84.8) | 46 (15.2) | | 1.65(1.54-1.77) | 1.25(1.16-1.36) |
| No | 742 (51.3) | 705 (48.7) | | 1.00 | 1.00 |
| Poor circulation | | | <0.001 | | |
| Yes | 486 (67.1) | 238 (32.9) | | 1.34(1.24-1.45) | 1.09 (1.01-1.18) |
| No | 512 (50.0) | 513 (50.0) | | 1.00 | 1.00 |
| Osteoporosis | | | <0.001 | | |
| Yes | 92 (70.8) | 38 (29.2) | | 1.26(1.12-1.42) | * |
| No | 906 (56.0) | 713 (44.0) | | 1.00 | |
| Rheumatism | | | <0.001 | | |
| Yes | 250 (71.6) | 99(28.4) | | 1.34(1.23-1.46) | * |
| No | 748 (53.4) | 652 (46.6) | | 1.00 | |
| Self-perceived health | | | <0.001 | | |
| Negative | 387 (75.7) | 124 (24.3) | | 1.53(1.42-1.65) | 1.22(1.16-1.28) |
| Positive | 611 (49.4) | 627 (50.6) | | 1.00 | 1.00 |

*Excluded after adjustment with other variables (with no statistical significance); **Screening for depressive disorder using the PRT questionnaire; ***Screening for dementia symptoms using the mini mental Bertolucci score; ****Likelihood ratio (Omnibus test):p<0.001

## DISCUSSION

The present study identified a high prevalence of functional dependence among the older adults receiving care from the FHS teams (57.0%). The analysis of the factors associated with the occurrence of functional dependence for the evaluated group highlights the fact that it is a multifactorial event and that it is especially influenced by health conditions, and involves several functional systems (cognition, mood/behavior, mobility and communication). International literature registers very different values for the assessment of functional dependence among older adults, with values ranging from 6.6% to 92.0%[11,12]. These disparate values must be carefully evaluated, as they are almost always the result of specific analyzes of the older adults and involve different populations or the use of different instruments for measuring or defining the studied event. The prevalence of 92.0%, for example, portrays a nonagenarian population[12].

In Brazil, in a study conducted in the interior of São Paulo, the authors recorded that 8.49% of the older adults were functionally dependent for BADLs and 10.96% for IADLs[13]. Another population-based survey conducted in Rio Grande do Sul found a prevalence of incapacity of 10.6% for basic activities and 34.2% for instrumental activities[14]. However, both studies used different scales to that used in the present study.

In other countries, the results of studies using a more similar population and instruments recorded higher results of functional impairment. In Poland, prevalences of 36.85% and 43.19% were found for BADLs and IADLs, respectively[15] while in Mexico, among older adults in the community, a prevalence of 31.3% was identified for dependence in IADLs[16]. Even so, the values observed in the present study identified a higher level of functional dependence, which should serve as a warning for local health professionals and managers.

Among the demographic variables, the present study identified an association with the female sex, age over 70 years, low levels of schooling and not currently working. The higher prevalence of functional impairment among women has been pointed out in other studies[17,18], while there is a consensus in literature in relation to more advanced age, albeit with different cut-off points[5,11,14,17,19]. Other studies have also registered the association between functional incapacity and low levels of education[14,17,19,20]. The findings can be explained by: greater levels of survival and the prevalence of non-fatal disabling conditions among women (osteoporosis, cataracts and diabetes, for example) as well as the fact that women report greater functional difficulties than men[18]. The difficulty in accessing education can result in risk factors for diseases and poorer working conditions, making it difficult to acquire healthy life habits[20]. Also, not currently working may be the result of the limitations imposed by functional impairment or by greater age, which would lead to retirement[21].

A study carried out with a population resident in the community identified a higher risk of functional dependence in older adults aged ≥ 80 years, the use of two or more medications and cognitive impairment[22]. Another Brazilian study reported that older adults who live alone have a worse state of health and health-related habits, with a higher prevalence of functional dependence associated with instrumental activities of daily living[23]. In the present study, an association with marital status was not observed. Similarly, family income was also not associated, a fact that may be the result of the more uniform characteristics of the assessed population, which is a group of older adults registered with FHS teams.

In relation to life habits, the present study identified that physical inactivity, assessed by self-reported physical inactivity or the absence of the habit of walking regularly, has a direct impact on functional dependence. Other studies have shown that regular physical activity is associated with a better state of functionality and quality of life for older adults[24,25]. Regular physical activity attenuates and reverses the loss of muscle mass contributing to the control of stress, obesity, diabetes and the improved functional fitness of older adults[26,27]. Leisure activities such as listening to the radio and reading were statistically associated with the studied event. Although investigations of such variables have not been identified in literature, the *Epidoso* study

concluded that leisure activities should be valued, as they have a protective effect on the functionality of older adults[28]. It is also possible that these data indicate that the older adults are more involved with their environment and have better cognitive conditions.

In relation to self-reported morbidities, those that maintained statistical significance, after multiple regression analysis, were: insomnia, obesity, cataracts, spinal problems, urinary incontinence and poor circulation. Chronic diseases had a strong impact on the functionality of the older adults. Some of these conditions have already been associated with functional dependence[15,20,29,30]. In a Spanish study, the authors reported that individuals suffering from more than one chronic disease were around twice as likely to be functionally dependent for ADLs and IADLs[30].

The present study identified a relationship between depressive symptoms and a higher prevalence of functional dependence, similar to the findings of another study[31]. This is a natural association, considering that this is a multifactorial disorder of the affective area and mood, involving biological, psychological and social aspects. A worse cognitive performance, measured by the Mini Mental State Examination in this study, was associated with impaired functionality, a finding reinforced in other studies[11,14,30,32]. This may be associated not only with the fact that cognition is integrated in one of the domains of the test, but also because it contributes to preserve functionality.

A history of falls in the previous year was also associated with functional dependence, after the adjusted analysis. Falls represent a serious problem for older adults and are related to high rates of morbidity and mortality and reduced mobility and the limited performance of several ADLs. A study using the same BOMFAQ instrument showed an increase in the difficulty of performing ADLs, in proportion to the number of previous falls[33]. In a prospective study conducted in São Paulo[34], there was a worsening of functional dependence after hospitalization, which is compatible with the data from the present study.

A negative self-perception of health was also shown to be associated with functional dependence. It seems natural that more pessimistic responses in the assessment of self-perceived health are associated with functional dependence. This variable is associated with morbidity and mortality in addition to limitations in ADL[35]. On the other hand, positive self-assessments of health are predictors of healthy aging[36].

The results of the present study must be considered in the light of certain limitations. It is a study with a population receiving care from FHS teams and, therefore, the results cannot be generalized to the entire older population. It is, however, the most vulnerable population and the one that demands the greatest care. As it is a cross-sectional study, it is not possible to establish causal relationships. Considering that a lot of information was self-reported, it is possible that memory limitations have affected the measured data. On the other hand, validated instruments were used and the sampling allocation process defined good representativeness among the studied group, and few losses were recorded.

## CONCLUSION

The study identified a high proportion of older adults with functional impairment. The variables statistically associated with functional dependence, after regression analysis, highlight the role of some self-reported morbidities and involve the various functional systems (cognition, mood/behavior, mobility and communication). Therefore, an expanded and updated perspective is necessary, so that the multidisciplinary team of the Family Health Strategy (FHS), can treat this group of older adults more effectively. These aspects must be reinforced in the formulation of government health promotion policies. Health care strategies for older adults should guarantee access to comprehensive and long-term services focused on the requirements of this public, aligning health systems to their needs, with a focus on multiprofessional care, as this can have a positive effect on the functional capacity of this population.

Health for the older population is closely linked to functionality, which includes the potential for managing one's own life or taking care of oneself. The present study is of particular importance as it evaluates the functional dependence of older adults residing in a community environment receiving care from FHS teams. Although some determinants in the functionality of older adults are genetic, many are related to the physical and social environment in which they live, as well as personal characteristics such as sex, ethnicity or socioeconomic conditions.

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Original Articles

1 of 9

# Evaluation of the functionality and mobility of community-dwelling older adults in primary health care

Laize Gabriele de Castro Silva[1]
Franciele Santos de Oliveira[1]
Ítala da Silva Martins[1]
Frankly Eudes Sousa Martins[1]
Tulia Fernanda Meira Garcia[2]
Ana Carolina Patrício Albuquerque Sousa[2]

## Abstract

*Objective:* To evaluate the functional capacity and mobility of older adults treated in primary health care and the association between adverse outcomes (functional dependence and reduced mobility) and sociodemographic and health conditions. *Method:* A cross-sectional and analytical epidemiological study was carried out in the municipal region of Caicó, Rio Grande do Norte, Brazil. Sociodemographic variables, presence of comorbidities, practice of physical activity, functional capacity (Lawton Scale) and mobility (Timed Up and Go Test) were investigated. Data analysis was performed using descriptive statistics, followed by bivariate analysis to investigate association variables and multivariate analysis (logistic regression). *Results:* Among the 109 elderly people evaluated, 29.4% were dependent in instrumental activities of daily living (IADL) and 67.9% had reduced mobility. The present study found a significant association between dependence in IADL and age equal to or greater than 75 years; while not practicing physical activity remained a factor of association with reduced mobility, regardless of sex, age and presence of co-morbidities. *Conclusion:* The findings emphasize the importance of the practice of physical activity, which was associated with better mobility, the construction of spaces of health promotion and disease prevention to encourage active aging for older adults, as well as a multi and interprofessional approach to comprehensive health care for older adults, with the use of functionality assessment tools.

[1] Universidade Federal Rio Grande Norte, Escola Multicampi de Ciências Médicas, Programa de Residência Multiprofissional em Atenção Básica. Caicó, RN, Brasil.

[2] Universidade Federal Rio Grande Norte, Escola Multicampi de Ciências Médicas. Caicó, RN, Brasil.

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Correspondence
Ana Carolina Patrício de Albuquerque Sousa
acapas@gmail.com

## INTRODUCTION

Population aging in Brazil is accelerating, resulting in repercussions for the public health system, with the increased prevalence of chronic non-communicable and/or disabling diseases[1]. This scenario challenges professionals and researchers to optimize care services to provide comprehensive and resolutive care for the growing older population[2].

The National Health Policy for Older Adults (or PNSPI) describes older adults as a group of greater vulnerability and therefore suggests the incorporation, in primary care, of tools that improve the quality and resolutive capacity of care. To this end, the policy advocates a multidimensional approach to older adults, encouraging the use of technical instruments for functional and psychosocial assessment, which enable the early detection of risk factors for adverse events, as well as the implementation of preventive and curative actions in a timely manner[3].

In older populations, functional capacity is an important evaluation and intervention parameter in the quest for active aging[4,5]. This is because functional disability of a physical and/or mental nature has great impacts on the life of older adults in terms of increased morbidity and mortality and the risk of hospitalization and permanence in long-term care facilities, resulting in social and economic burden for the older adults themselves, their families and the health system[6]. In this sense, the decline of mobility in older adults is an important predictor of health in old age, allowing the early detection of sarcopenia and functional limitations, and operationalizing the health care of older adults to prevent adverse events, such as functional disability and falls[7].

In Brazil, primary care should function as an organizer of care in the public health system, with a fundamental role in the comprehensive care of older adults[8]. In this scenario, comprehensive geriatric assessment (CGA) represents an instrument for the multidimensional diagnosis of older adults, contributing to the improvement and maintenance of functional capacity and mobility[9]. However, it is necessary to establish strategies to encourage the greater implementation of and adherence to this instrument in primary care.

The importance of the present study is based on aspects related to health planning in accordance with the current reality, health surveillance and comprehensive care of older adults, and it is committed to encouraging the use of validated and reliable instruments for the evaluation of such individuals by members of primary health care teams.

The objective of the present study was therefore to evaluate the functional capacity and mobility of older adults treated by primary health care, and the association between adverse outcomes (functional dependence and reduced mobility) and sociodemographic aspects and health conditions.

## METHOD

A cross-sectional and analytical epidemiological study was conducted from September to November 2018.

The present study was carried out in Caicó, a municipal district in the state of Rio Grande do Norte (RN), Brazil, 282 km from the state capital, Natal. According to 2010 census data, Caicó has an HDI of 0.71, the fourth best in the state. In addition, it has an increasing human longevity levels, with a life expectancy of around 74.4 years, higher than the Brazilian average and one of the highest in municipal districts in the north and north east of Brazil. Caicó has 5,980 people aged 65 and over, considering both the urban and rural population[10]. In all, it has 18 basic health units (BHU) with a population coverage of around 95%.

The sample of the present study was obtained by convenience, based on the work of the students of the Multiprofessional Residency Program in Primary Care of the Multicampi School of Medical Sciences of Rio Grande do Norte (UFRN). A convenience sample was chosen as the BHU registration records were not up to date and did not distinguish between the rural and urban population, nor between institutionalized older adults and those living in the community.

Thus, older adults aged 65 years and above, of both sexes and treated at five BHU were included. Exclusion criteria were: not being located for evaluation after

three attempts during recruitment and being unable to complete all stages of data collection.

The information collected was related to sociodemographic characteristics, the presence of comorbidities, physical activity, functional capacity and mobility. The data were collected by a team of three basic care (BC) residents, who were duly trained to apply the collection instruments. The participants were invited to participate in the research and sign a Informed Consent.

The following information was collected: sex, age, marital status, color/ethnicity, education and family income. The presence of comorbidities was based on self-reported information, considering the medical diagnosis in the last year of the following most frequent chronic diseases among older adults.[11]: heart diseases; arterial hypertension; diabetes *mellitus*; malignant tumors; arthritis or rheumatism; lung diseases; depression; osteoporosis and strokes. Presence of comorbidities was considered the self-reporting of two or more diseases.

The practice of physical activity was investigated by asking the participants if they practiced or had practiced any kind of physical exercise and/or sport in the previous three months, and how often.

Data on functional capacity were obtained using the Lawton Scale, a validated instrument to assess instrumental activities of daily living (IADL). In this scale, the questions investigate the ability of the individual to perform tasks such as preparing meals and performing housework, asking whether or not they perform such tasks and whether or not they do so with the help of others. The maximum score is 27 points and the minimum nine points. Independence in performing such activities is directly related to the capability to live independently in the community[12].

Mobility was evaluated using the Timed Up and Go (TUG) test. This test is used to assess the functional mobility of the individual through the analysis of sitting balance, seated to standing transfers, gait stability and change in gait direction,

without the use of compensatory strategies[13,14]. Older adults who completed the TUG within 10 seconds were considered to have good mobility; those who completed the TUG within 11 seconds or more were considered to have reduced mobility, following the Edmonton Frail Scale (EFS) classification for risk of frailty.[15.]

Data were stored and processed. Descriptive statistics (frequency, measures of central tendency and dispersion) were used to characterize the sample, followed by bivariate analysis ($X^2$) to investigate the variables of association, while multivariate analysis (logistic regression) was used to adjust for possible confounding variables. A 95% CI and significance level of $\alpha = 5\%$ were adopted.

The present study was approved by the Research Ethics Committee of the Trairi Faculty of Health Sciences (or FACISA) of the Universidade Federal do Rio Grande do Norte (protocol No. 2.452.346), as determined by National Health Council Resolution No. 466/2012, which defines the guidelines and regulatory standards governing research involving human beings.

## RESULTS

A total of 113 older adults were interviewed, of whom four were excluded because they did not complete all the steps of the study. Thus, 109 older adults were included in the data analysis, with a mean age of 71.5 (±5.51) years (minimum age 65 and maximum 88).

Table 1 characterizes the sample according to sociodemographic variables and health conditions. Most were female (77.1%); aged 65 to 69 years (45.9%); married (47.7%); white (46.8%) or brown-skinned (33.0%); with an educational level below primary school (73.4%) and an income lower than twice the minimum wage (51.4%). In terms of clinical conditions, 57.8% said they had two or more comorbidities and only 39.4% said they performed some type of physical activity.

**Table 1.** Distribution of sociodemographic characteristics and health conditions of older adults (N=109). Caicó, RN, 2019.

| Sociodemographic variables | n (%) |
|---|---|
| Sex | |
| Female | 84 (77.1) |
| Male | 25 (22.9) |
| Age range (years) | |
| 65 to 69 | 50 (45.9) |
| 70 to 74 | 27 (24.8) |
| 75 or more | 32 (29.4) |
| Marital status | |
| Single | 12 (11.0) |
| Married | 52 (47.7) |
| Divorced/Separated | 12 (11.0) |
| Widowed | 33 (30.3) |
| Ethnicity | |
| "Yellow" (Asian-Brazilian) | 6 (5.5) |
| White | 51 (46.8) |
| Indigenous | 1 (0.9) |
| Black | 15 (13.8) |
| "Brown" (Mixed-race) | 36 (33.0) |
| Schooling | |
| Illiterate | 10 (9.2) |
| Incomplete primary | 70 (64.2) |
| Complete primary | 22 (20.2) |
| Complete secondary | 6 (5.5) |
| Higher | 1 (0.9) |
| Income (minimum wage) | |
| Less than minimum wage | 10 (9.2) |
| Min. wage to twice min. wage | 46 (42.2) |
| Twice minimum wage or more | 53 (48.6) |
| Clinical variables | |
| Presence of comorbidities | |
| Yes | 63 (57.8) |
| No | 46 (42.2) |
| Practice physical activity | |
| Yes | 43 (39.4) |
| No | 66 (60.6) |
| Frequency of physical activity | |
| None | 66 (60.6) |
| 1 to 2 days per week | 14 (12.8) |
| 3 to 4 days per week | 7 (64.4) |
| 5 to 6 days per week | 18 (16.5) |
| Every day | 4 (3.7) |

Table 2 presents the result of the bivariate analysis of the association between functional capacity and sociodemographic variables and health conditions. Among the 109 older adults evaluated, 29.4% (n=32) were dependent in the performance of IADL. The chi-squared test showed a significant association between dependence in the performance of IADL and the age group 75 years or older ($p<0.001$).

A total of 67.9% (n=73) of the sample had reduced mobility in the TUG test. Table 3 describes the association between TUG and the sociodemographic variables and health conditions, with a significant association observed between reduced mobility and the presence of comorbidities ($p=0.04$) and non-physical activity ($p<0.01$).

**Table 2**. Bivariate analysis of the relationship between functional capacity and sociodemographic variables and health conditions (N= 109). Caicó, RN, 2019.

| Variables | Functional Capacity | | p-value |
|---|---|---|---|
| | Dependent - IADL | Independent – IADL | |
| | n (%) | n (%) | |
| Gender | | | |
| Male | 9 (36.0) | 16 (64.0) | 0.40 |
| Feminine | 23 (27.4) | 61 (72.6) | |
| Age range (years) | | | |
| 65 to 74 | 13 (16.9) | 64 (83.1) | <0.001 |
| 75 or more | 19 (59.4) | 13 (40.6) | |
| Presence of comorbidities | | | |
| Yes | 22 (34.9) | 41 (65.1) | 0.13 |
| Not | 10 (21.7) | 36 (78.3) | |
| Practice of physical activity | | | |
| Yes | 15 (34.9) | 28 (65.1) | 0.30 |
| No | 17 (25.8) | 49 (64.2) | |

IADL= instrumental activities of daily living.

**Table 3.** Bivariate analysis of Timed Up and Go (TUG) mobility with sociodemographic variables and health conditions (N=109). Caicó, RN, 2019.

| Variables | TUG Mobility | | p-valuer |
|---|---|---|---|
| | Good Mobility (TUG ≤10 s) | Reduced Mobility (TUG ≥11 s) | |
| | n (%) | n (%) | |
| Sex | | | |
| Male | 9 (36.0) | 16 (64.0) | 0.81 |
| Feminine | 27 (32.1) | 57 (67.9) | |
| Age range (years) | | | |
| 65 to 74 | 29 (37.7) | 48 (62.3) | 0.12 |
| 75 or more | 7 (21.9) | 25 (78.1) | |
| Presence of comorbidities | | | |
| Yes | 16 (25.4) | 47 (74.6) | 0.04 |
| Not | 20 (43.5) | 26 (56.5) | |
| Practice of physical activity | | | |
| Yes | 21 (48.8) | 22 (51.2) | <0.01 |
| Not | 15 (22.7) | 51 (77.3) | |

Following bivariate analysis, binary logistic regression analysis was performed to control for possible confounding variables, and to evaluate factors associated with the functional capacity and mobility of community-dwelling older adults (Tables 4 and 5). Thus, advanced age was confirmed as a factor of association for dependence in the performance of IADL, and the non-practicing of physical activity remained as a factor of association for reduced mobility, regardless of gender, age and the presence of comorbidities.

**Table 4.** Binary logistic regression model to assess factors associated with functional capacity (IADL) among community-dwelling older adults. Caicó, RN, 2019.

| Model for dependence in the performance of Instrumental Activities of Daily Living (IADL) | | |
|---|---|---|
| Variables | *Odds Ratio* (CI95%) | *p*-value |
| Model 1: Sociodemographic characteristics | | |
| Gender | | |
| Male | 1.00 | 0.44 |
| Female | 0.65[0.21-1.96] | |
| Age range (years) | | |
| 65 to 74 | 1.00 | 0.001 |
| 75 or more | 7.31 [2.83-18.91] | |
| Model 2: Health conditions | | |
| Presence of comorbidities | | |
| No | 1.00 | 0.15 |
| Yes | 2.01 [0.76-5.31] | |
| Practice of physical activity | | |
| Yes | 1.00 | |
| No | 0.58 [0.22-1.49] | 0.26 |

**Table 5.** Binary logistic regression model for assessing factors associated with the mobility (TUG) of community-dwelling older adults. Caicó, RN, 2019.

| Model for reduced mobility (TUG ≥11s) | | |
|---|---|---|
| Variables | *Odds Ratio* (IC 95%) | *p*-value |
| Model 1: Sociodemographic characteristics | | |
| Sex | | |
| Male | 1.00 | 0.78 |
| Female | 1.14 [0.41-3.16] | |
| Age range (years) | | |
| 65 to 74 | 1.00 | 0.10 |
| 75 or more | 2.33 [0.84-6.45] | |
| Model 2: Health conditions | | |
| Presence of comorbidities | | |
| No | 1.00 | |
| Yes | 2.26 [0.95-5.37] | 0.06 |
| Practice of physical activity | | |
| Yes | 1.00 | 0.005 |
| No | 3.49 [1.46-8.31] | |

## DISCUSSION

The profile of the sample of the present study was consistent with other studies in Brazil, with a predominance of women (77.1%)[1,16]. Gerontology researchers characterize this process as the feminization of old age, and as a phenomenon that especially occurs at the most advanced ages[17].

In terms of age group, the predominant age of older adults in the present study was 65 to 69 years. There was a significant association between dependence in IADL and age ($p<0,001$), a finding that reaffirms the fact that advancing age may be related to a higher degree of dependence among older adults, corroborating other studies[18,19]. It is known that advanced age generates greater impairment of physical and functional aspects[20]. Moreover, in people over 75, there is a higher risk of developing chronic and degenerative diseases, reducing the ability of older adults to live independently and enjoy active aging.[21]

No significant associations were observed in the present study between functional capacity and gender, the presence of comorbidities and physical activity, although another study found significant associations between functional limitation and the female gender[19]. However, it is worth noting that the setting of the present study was basic health units, meaning a selection bias can be assumed, with men more prone to previously installed adverse events.

The study by Paiva et al.[22] found no significant association between the presence of morbidity and functional capacity in older adults, corroborating the findings of the present study. In the same context, the present study also agrees with the statements of the study by Paiva et al.[22] that this finding may be justified by the fact that the older adults approached receive regular medical follow-up monitoring, and thus have their comorbidities controlled and do not therefore suffer functional impairment.

There was no association between physical activity and functional capacity. Moraes et al.[23], in a study conducted in Fortaleza, did not find a direct relationship between these two variables. In contrast, the present study highlighted the relationship between reduced mobility and the absence of physical activity, regardless of sex, age and presence of comorbidities. The results of the study by Moraes et al.[23] were similar, and the authors concluded that regular physical activity may be related to better functional mobility. Fernandes et al.[24] indicated in their results the importance of the practice of physical exercise for older adults and its positive impact on functional mobility. Thus, it can be stated that physical activity can act as a preventive health strategy, representing a protective factor for the loss of mobility, despite advancing age.[25]

In this context, primary health care should commit to providing comprehensive care for older adults and their families, as well as being at the forefront of the assessment of functional decline, seeking to develop promotion, prevention and rehabilitation strategies[26]; favoring health care with the aim of delaying the deleterious effects of the aging process, and preserving the independence and autonomy of older adults[27]. Primary care should therefore foster strategies that include care beyond medicalization and health care, with professionals and spaces that stimulate and favor the practice of physical activity and better physical performance in older adults, to prevent adverse events and stimulate healthy and active aging[28].

However, given the importance of the theme, further studies with wider samples and cohort studies are suggested to allow a more accurate assessment of functional capacity and mobility in older adults, and which incorporate the training of primary care professionals, as part of the continuing education process and as a strategy to strengthen the scope of care offered to older users.

The main limitation of the present study was its sample, which is considered relatively small for an epidemiological study; and which was collected for convenience in only five of the 18 basic health units in the municipal region, due to the operational possibilities of the time and human resources available for the performance of data collection.

However, it is important to emphasize that this study was conducted with methodological rigor and the necessary care was taken in the sampling process,

so that even if the sample was expanded, there would be little variation in the study parameters.

## CONCLUSION

The present study found a significant association between functional capacity and age equal to or greater than 75 years; while the non-practicing of physical activity remained as a factor of association with reduced mobility, regardless of sex, age and the presence of comorbidities.

Based on these findings, the use of instruments for the assessment of functional capacity and mobility is of great importance for the development of specific actions aimed at the autonomy and independence of older adults, in view of the current population aging in Brazil. The results also emphasize the importance of practicing physical activity, the construction of spaces of health promotion and illness prevention to encourage active aging, and of a multi- and interprofessional approach to the integral health care of older adults.

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# Prevalence of depressive symptoms and associated factors among older adults treated at a referral center

Patrícia Oliveira Silva[1]
Bruna Menezes Aguiar[1]
Maria Aparecida Vieira[2]
Fernanda Marques da Costa[2,3,4]
Jair Almeida Carneiro[3,4]

## Abstract

The present study aimed to estimate the prevalence of depressive symptoms and associated factors among older adults treated at a referral center. A cross-sectional study was carried out with a sample of 360 older adults treated at a Referral Center for the Health of Older Adults in the north of Minas Gerais, Brazil. The following data were collected in 2017: demographic, socioeconomic, morbidity, hospital admission in the last year, frailty (Edmonton Frail Scale), functional capacity (Katz Index, Lawton and Brody Scale) and presence of depressive symptoms (Geriatric Depression Scale - GDS-15). Multiple analysis was performed through logistic regression. A prevalence of depressive symptoms was observed in 37.2% of the sample. The variables associated with depressive symptoms were: negative perception about one's own health (OR=1.9, 95% CI 1.34-2.70); frailty (OR=1.94, 95% CI 1.41-2.66); having suffered falls (OR=1.24, 95% CI 1.01-1.61); having been hospitalized in the last year (OR=1.56, 95% CI, 1.11-2.27); (OR=2.56, 95% CI 1.38-4.77) and residing alone (OR=1.66, 95% CI 1.09-2.53). Thus, a high prevalence of depressive symptoms was identified among the older adults, evidencing the need for an effective and immediate approach by health professionals.

[1] Universidade Estadual de Montes Claros, Centro de Ciências Biológicas e da Saúde, Departamento de Enfermagem. Montes Claros, MG, Brasil.

[2] Universidade Estadual de Montes Claros, Centro de Ciências Biológicas e da Saúde, Departamento de Enfermagem, Programa de Pós-Graduação em Cuidado Primário em Saúde. Montes Claros, MG, Brasil.

[3] Universidade Estadual de Montes Claros, Centro de Ciências Biológicas e da Saúde, Departamento de Saúde Mental e Saúde Coletiva. Montes Claros, MG, Brasil.

[4] Centro Universitário FIPMoc de Montes Claros, Departamento de Medicina. Montes Claros, MG, Brasil.

Correspondence
Patrícia Oliveira Silva
patymoc2010@gmail.com

## INTRODUCTION

Depression is the most common mood disorder to affect the mental health of older adults. When underdiagnosed, it can become chronic, causing great psychological distress, functional dependence, isolation, poor quality of life, greater use of health services, and increased risk of death[1].

In older adults, a major depressive disorder is characterized by the presence of a predominantly depressed or irritable mood and anhedonia. There is a subjective sense of diminished energy, disinterest, slowness, and pessimistic thoughts. In general, these symptoms are accompanied by changes in sleep quality and appetite, cognitive impairment, behavioral and psychosomatic changes, and without treatment the condition can last months or years. Investigating such a disorder is therefore essential, as it can lead to a reduction in the life expectancy and impairment of the autonomy and functional independence of older adults, and a deterioration in quality of life[2,3].

It is common for older adults to have an insufficient number of depressive symptoms to diagnose a major depressive disorder. In this case, the term "minor depressive disorder" applies, in which the individual suffers from the presence of the relevant symptoms, but is able to perform most of their activities[4-5]. The term "clinically significant depressive symptoms" (CSDS) refers to a broad category of depressive symptoms detected using screening scales. Most older adults with CSDS do not meet the criteria for the diagnosis of "major depression"[5].

In Brazil, the prevalence of major depressive disorder among non-institutionalized older adults varies from 3% to 15%, while the prevalence of CSDS ranges from 13% to 39%, indicating a higher prevalence of depressive symptoms than the rates reported in non-Brazilian literature, the average of which is around 13.5%[6-8]. The disagreement between the observed data highlights the need for further studies, so that the variables identified can be addressed and treated more effectively and immediately by health professionals and managers[8].

Studies[5,9-11] have illustrated the relationship between depressive symptoms in older adults and sociodemographic factors such as the female gender; advanced age; low education, and the lack of a marital partner. With regard to health conditions, factors described as associated with depressive signs are functional disability; a negative perception of health, smoking; greater use of medicines; insomnia and chronic somatic comorbidities. Despite these aspects described in literature, there are still gaps in knowledge, as there is a lack of studies[1,11-13] relating to older adults treated in referral services for the health of this population.

Studies[5,11-13] have shown that frailty associated with aging increases susceptibility to disease and influences the functional capacity of older adults, in addition to generating a negative perception of one's own health, directly compromising the individual's ability to cope with stressful conditions. It is important to identify the self-rated health of the population, as a negative perception of health is described in literature as a predictor of the mortality, functional disability and mental health of older adults[1,5,11].

In the northern region of the state of Minas Gerais, there are few records of evaluations that address depressive symptoms and associated factors in older adults[5,11]. The assessment of the living and health conditions of this population has the potential to generate new knowledge and support the decision making of health managers. Thus, the present study aimed to estimate the prevalence of depressive symptoms and their associated factors among older adults treated at a referral center.

## METHOD

A cross-sectional and analytical study with a quantitative approach was carried out, with data collected through a structured questionnaire. The scenario of this study was one of the centers of the *Mais Vida* (More Life) Program located in the north of Minas Gerais. The program is based around an integrated health care network for the older population, with emphasis on Referral Centers

for the Health Care of Older Adults (or CRASI), with care provided by a multidisciplinary team. The centers provide specialized health care for the older population considered frail or at risk, refererred by a Primary Health Care unit[11].

The evaluated group was selected through non-intentional convenience sampling, according to the demand for treatment, between May and July 2017, due to the difficulty of random selection. Data were collected primarily through direct contact and interviews with the target population, which took place during the morning and afternoon sessions at CRASI in northern Minas Gerais. The interviewers were previously trained and calibrated (kappa 0.8).

To define the sample size, a calculation was applied based on a conservative prevalence of 50% (for the occurrence of the symptoms of depressive disorders) and a significance level of 5%, with a confidence interval of 95% and a tolerable sampling error of 3%. This first estimate of sample size was increased by 20% to explore the adjusted associations between the independent variables and depressive symptoms.

The inclusion criteria were age 65 and over and be receiving treatment at CRASI, while the exclusion criteria were: being on antidepressants; present cognitive disability, according to the assessment of family members; an uncorrected hearing deficit that hindered the understanding of the questions, and refusal to participate in the study by the older adults or their families. Older adults aged 60 to 64 years were also excluded, as the instrument used to assess frailty has only been validated for those aged 65 years or older[5].

Cognitive disability based on the assessment of family members was taken as a plausible measure given the complexity of applying the instrument. In this case, before the beginning of the interview, the data collection instrument was presented to the family members, who judged if the older adult would be able to answer it. The data collection instruments used were based on similar studies[5,11] and were previously tested in a pilot study, the data of which were not included in the final study. A total of 360 older adults participated in the study.

The outcome variable of this study, "depressive symptoms", was obtained by applying the Geriatric Depression Scale (GDS-15) with 15 questions. This instrument has been validated for Brazil and consists of negative and affirmative questions, in which a result of six or more points identifies depressive symptoms. The cutoff point adopted was five for non-cases and six for cases[14].

The independent variables studied were: gender; age; skin color; marital status; living arrangement; own income; categorized household income; schooling; ability to read; falls in the last 12 months - number of falls and what causes the falls; have a caregiver; frailty and self-perception of health. Variables related to the self-reported chronic morbidities were hypertension, diabetes mellitus, heart disease, arthritis, osteoporosis, stroke and cancer; polypharmacy[15] (considered to be the concomitant use of five or more medications); hospitalization in the previous year; instrumental activities of daily living (IADL) and basic activities of daily living (BADL).

Frailty was assessed by the Edmonton Frail Scale (EFS), an instrument that assesses nine domains; cognition; health condition; functional independence; social support; use of medication; nutrition; mood; urinary continence and functional performance. These domains are divided into 11 items, with a score from 0 to 17. For statistical analysis, the scale results were divided into two levels: not frail (final score ≤6) and frail (final score >6)[16].

The BADLs and IADLs were measured by the Katz Index and the Lawton and Brody Scale, respectively. The first scale was used to evaluate BADLs, and consists of six items: bathing; getting dressed; using the bathroom; transfers; controlling continence and feeding oneself. The Katz index establishes a score between 0 and 3 points, with a score of zero meaning the older adult is considered completely independent for BADLs, a score of one meaning the individual needs the help of an accessory (canes, bars, furniture support) to perform activities, two points meaning the older adult needs human help to perform the tasks, and a score of three meaning the older adult is classified as completely dependent in BADLs[17].

The Lawton and Brody Scale is made up of nine more complex everyday tasks such as cooking; performing household activities; washing clothes; handling money; going to far-off places; using the telephone; taking medications; making purchases and using means of transport. According to the Lawton and Brody scale, the older adults were classified as independent for IADLs when they obtained a score above 27 points, while those with a maximum score of 26 points were classified as dependent[17,18].

The data collected were analyzed. A descriptive analysis of the data was initially performed. Then, the existence of a statistical association between the dependent variable (presence of depressive symptoms, yes or no) and the independent variables was investigated. For this, bivariate analyzes were performed (Pearson's chi-squared test or Fisher's exact test), adopting a significance level of ≤ 0.20 to include independent variables in the multiple model. The final model was generated by multiple logistic regression analysis and the variables with an association with depressive symptoms were maintained in the final model up to a significance level of 5% ($p \leq 0.05$).

The study complied with the ethical principles of National Health Council (or CNS) Resolution No. 466/12 and was approved by the Research Ethics Committee under opinion No. 1,003,534. All the participants were informed about the study and presented their consent, signing a free and informed consent form. When the older adults could not sign, they registered their fingerprints or someone in the family signed the form, allowing the interview for data collection.

## RESULTS

Of the 360 older adults, the predominant age group was between 65 and 79 years (75.3%), with a mean age of 75 years (SD±7.6). Most of older adults were female (78.1%), described having non-white skin color (69.6%), being widowed (42.8%), living with other family members (63.6%), having their own income (97.5%), earning more than one minimum wage (68.0%), having an elementary education (46.4%), and being able to read (58.6%).

Most of the older adults (54.4%) reported having suffered a fall in the previous 12 months, while 42.8% of these falls were caused by tripping/slipping, 63.6% of the older adults were afraid of falling, 67.8 % did not have a caregiver, 47.2% were frail and 60.6% had a negative perception of health.

In relation to aspects of morbidity, it was found that hypertension was the most common chronic disease in older adults (74.7%), followed by arthritis/rheumatism (43.9%), osteoporosis (34.2%), heart disease (21.9%), diabetics (20.3%), a history of strokes (10.6%) and cancer (4.4%). Polypharmacy was identified in 66.6% of the older adults, while hospitalization in the previous year was 21.2%, 78.6% were dependent in the performance of IADL and 21.4% in BADL.

The prevalence of depressive symptoms among older adults treated at CRASI was 37.2%; 39.1% among women and 30.4% among men. For older adults aged 80 years and over, the prevalence was 38.2%; while for younger older adults, aged between 65 and 79 years old, it was 36.9%. The associations between the independent variables and depressive symptoms are presented in Tables 1 and 2.

**Table 1.** Bivariate analysis of depressive symptoms among older adults according to sociodemographic variables (N=360). Montes Claros, MG, 2017.

| Independent Variables | Depression | | p-value |
| | Yes n (%) | No n(%) | |
|---|---|---|---|
| Sex | | | |
| Male | 55(69.6%) | 24(30.4%) | 0.15 |
| Female | 171(69.9%) | 110(39.1%) | |
| Age (years) | | | |
| Up to 79 | 171(63.1%) | 100(36.9%) | 0.82 |
| 80 and over | 55(61.8%) | 34(38.2%) | |
| Skin color | | | |
| White | 78(57.8%) | 57(42.2%) | 0.12 |
| Others | 148(65.8%) | 77(34.2%) | |
| Marital Status | | | |
| With companion | 98(67.1%) | 48(32.9%) | 0.15 |
| Without companion | 128(59.8%) | 86(40.2%) | |
| Living Arrangements | | | |
| Don't live alone | 179(59.9%) | 120(40.1%) | 0.01 |
| Live alone | 47(77.0%) | 14(23.0%) | |
| Has own income | | | |
| Yes | 221(63.0%) | 130(37.0%) | 0.65 |
| Not | 5(55.6%) | 4(44.4%) | |
| Schooling | | | |
| 5 years or more | 40(78.4%) | 11(21.6%) | 0.01 |
| Up to 4 years | 186(60.2%) | 123(39.8%) | |
| Ability to read (can read) | | | |
| Yes | 134(63.5%) | 77(36.5%) | 0.73 |
| Not | 92(61.7%) | 57(38.3%) | |
| Categorized household income | | | |
| More than 1 minimum wage | 146(59.6%) | 99(40.4%) | 0.68 |
| Up to 1 minimum wage | 80(69.6%) | 35(30.4%) | |

Source: Field Research (CRASI), May and June 2017.

**Table 2**. Bivariate analysis of depressive symptoms among older adults according to health conditions and morbidity (N=360). Montes Claros, MG, 2017.

| Independent Variables | Depression | | p-value |
| | Yes n(%) | No n(%) | |
|---|---|---|---|
| Hypertension | | | |
| Yes | 168(62.5%) | 101(37.5%) | 0.82 |
| No | 58(63.7%) | 33(36.3%) | |
| Diabetes | | | |
| Yes | 46(63%) | 27(37%) | 0.96 |
| No | 180(62.7%) | 107(37.3%) | |

to be continued

Continuation of Table 2

| Independent Variables | Depression | | |
| | Yes n(%) | No n(%) | p-value |
|---|---|---|---|
| Cardiac disorders | | | |
| Yes | 48(60.8%) | 31(39.2%) | 0.67 |
| No | 178(63.3%) | 103(36.7%) | |
| Cancer | | | |
| Yes | 8(50.0%) | 8(50%) | 0.27 |
| No | 218(63.4%) | 126(36.6%) | |
| Arthritis / Rheumatism | | | |
| Yes | 97(61.4%) | 6138.6% | 0.63 |
| No | 129(63.9%) | 73(36.1%) | |
| Osteoporosis | | | |
| Yes | 74(60.2%) | 49(39.8%) | 0.14 |
| No | 152(64.1%) | 85(35.9%) | |
| Stroke | | | |
| Yes | 22(57.9%) | 16(42.1%) | 0.51 |
| No | 204(63.4%) | 118(36.6%) | |
| Has a caregiver | | | |
| No | 166(68.0%) | 78(32%) | 0.00 |
| Yes | 60(51.7%) | 56(48.3%) | |
| Falls in the previous 12 months | | | |
| No | 97(59.1%) | 67(40.9%) | 0.19 |
| Yes | 129(65.8%) | 67(34.2%) | |
| Hospitalizations in the previous year | | | |
| None | 171(60.2%) | 113(39.8%) | 0.05 |
| One or more | 55(72.4%) | 21(27.6%) | |
| Self-perception of health | | | |
| Negative | 112(51.4%) | 106(48.6%) | 0.00 |
| Positive | 114(80.3%) | 18(19.7%) | |
| Frailty | | | |
| Not frail | 150(78.9%) | 40(21.1%) | 0.00 |
| Frail | 76(44.7%) | 94(55.3%) | |
| Polypharmacy | | | |
| No | 159(62.2%) | 81(33.8%) | 0.05 |
| Yes | 67(55.8%) | 53(44.2%) | |
| Instrumental Activities of Daily Living (IADL) | | | |
| Up to 26, dependent | 157(55.7%) | 125(44.3%) | 0.00 |
| 27 and above, independent | 69(88.5%) | 9(11.9%) | |
| Basic Activities of Daily Living (BADL) | | | |
| Independent | 187(66.1%) | 96(33.9%) | 0.13 |
| Dependent | 39(50.6%) | 38(49.4%) | |

Source: Field Research (CRASI), May and June 2017.

After multiple logistic regression analysis, the variables that remained associated with depressive symptoms were: negative perception of one's own health (OR=1.9; 95% CI 1.34-2.70); presence of frailty (OR=1.94; 95% CI 1.41-2.66); have suffered falls (OR=1.24; 95% CI 1.01-1.61); have been hospitalized in the last year (OR=1.56; 95% CI 1.11-2.27); have functional disability for the performance of IADLs (OR=2.56; 95% CI 1.38-4.77) and reside alone (OR=1.66; 95% CI 1.09-2.53).

## DISCUSSION

In the present study, the prevalence of depressive symptoms was high, 37.2%, when compared to population-based studies conducted in Florianópolis, Santa Catarina[1], Pelotas, Rio Grande do Sul[19], and northern Minas Gerais[5], which presented lower values than those observed in this study, using the same instrument (GDS-15). However, the prevalence of depressive symptoms in community-dwelling older adults is lower than that observed among the older adults treated at CRASI, possibly due to the clinical profile of referral to the service, according to the criteria of the Older Adults Health Care Network[12,20].

Studies that investigated the prevalence of depressive symptoms in older adults treated at referral centers in Brazil revealed a prevalence ranging from 7.1%, with 313 older adults based on a screening performed in Passo Fundo, Rio Grande do Sul[13], to 30.9% based on a survey of 317 older adults in the city of Uberaba, Minas Gerais[12]. Part of this disparity between findings is due to the methodology, the instrument used in the research, the inclusion criteria, the peculiarities of each region and the way of measuring data, which may interfere with the final results of the study.

Non-Brazilian data also varies due to the instruments and population evaluated. A study conducted in New York[21] with 378 older patients found a prevalence of depressive symptoms in older adults of 31.0%, based on the Patient Health Questionnaire-9 (PHQ-9). A German study[22] that used GDS-15 with around 3,300 older adults reported a prevalence of 9.7%. Another Japanese study[23], using the same scale with 5,400 community-dwelling older adults, reported a prevalence of 33.5%.

The prevalences found by the studies, regardless of their variations, highlight the significance of the theme. It also suggests that screening criteria are not being followed or that the criteria may need to be reevaluated, especially considering the clear process of population aging in Brazil and around the world[5,24]. The factors associated with depressive symptoms found in this study determine the risk of such symptoms based on health conditions (negative perception of one's own health, being frail, having suffered falls, being hospitalized in the previous year and inability to perform IADL).

The negative perception of one's own health was associated with depressive symptoms, as it was in other studies[5,25,26]. As it is a subjective assessment, self-perception of health has a multidimensional character, as the way individuals view their health status will determine their behavior, choices and way of living[25]. With the loss of cognitive, sexual and work functions, the decrease of social relations and the feeling of disability, among other elements, influence both a worse perception of health and the occurrence of depressive symptoms.[19]

Perception of health is an important marker of biological, psychological and social dimensions and is useful for assessing quality of life. Studies have shown that the individual's own reporting of poor health can be understood as a depressive symptom[1,5].

Depressive symptoms were associated with the presence of frailty, a similar result to that identified in other studies that also tracked frailty through the EFS[27-29]. Greater frailty was expected in this study, since frail older adults receive an absolute recommendation for a specialized, multidimensional and multidisciplinary assessment, according to the criteria of the older adults health care network where data collection was performed[20].

Frailty has been defined as a syndrome of declining energy, based on changes that occur with aging, manifesting itself as a reduction in gait speed; weight loss; fatigue; decreased grip strength and low levels of physical activity. Thus, frailty has the potential to affect every aspect of the life of older adults leaving them vulnerable to depressive symptoms. In addition, it is an event whose effects extend beyond the older adult and may cause family and caregiver burden.[5,27-28]

The occurrence of falls among older adults proved to be a risk for depressive symptoms, as in other similar studies[17,27-29]. Research[17,29] has pointed out the relationship between the presence of frailty, the use of drugs and falls among older adults, which may occur due to inappropriate dosages, adverse effects and drug interactions.

The costs and implications of falls among older adults are significant for the individual, due to physical and psychological trauma, which, in addition to causing possible fractures, can also cause a fear of falling again, a loss of confidence, and a restriction of activities of daily living, as well as declining health and the increased risk of institutionalization. These limitations cause impairment in the movement of the individual, causing social isolation and the possible triggering of depressive symptoms[19,29].

The presence of depressive symptoms was associated with hospitalization in this and other studies[7,30]. Although the presence of noncommunicable chronic diseases (NCDs) is not always accompanied by depressive symptoms, their cumulative harmful effects during the aging process lead to a higher risk of adverse health events. The difficulty in carrying out a correct diagnosis is due to conditions directly associated with increased morbidity and mortality in the older adult population, as well as a greater demand for health services and length of hospital bed occupancy. Remaining in hospital may be considered a risk factor for depressive symptoms[7].

The relationship between depressive symptoms and functional dependence, whether for BADL or IADL, has been extensively described in literature[11,28,30,31]. Functional capacity is an important marker of aging and the quality of life of older adults. With functional decline depressive symptoms may appear, due to the physical, social and functional impairment of the individual, leading to important health complications that can directly interfere with the onset of depressive symptoms[28,30].

It is noteworthy that the present study found an association between depressive symptoms and dependence in IADLs. These activities require greater physical and cognitive integrity as they are related to the social participation of the subject, such as shopping, answering the telephone and using

means of transportation[28]. The loss of autonomy and limitations in daily living generate an imbalance in emotions, well-being and social image and may trigger depressive symptoms[11].

Regarding sociodemographic aspects, the condition of living alone was associated with depressive symptoms. Similar studies[13,29,30] have identified that older adults who live alone have a greater perception of loneliness, either through grief, social isolation or abandonment. From the point of view of life experience, older adults experience a situation of continued loss, and these losses often arouse feelings of discouragement and sadness that eventually lead to depressive symptoms. Conditions of social and family support may influence the onset of depressive symptoms among older adults, as well as the poor prognosis of existing comorbidities, which may contribute to higher mortality, either due to the increased risk of suicide or the evolution of chronic diseases[11].

Despite their high prevalence, depressive symptoms are poorly investigated and underdiagnosed in the older adult population. Thus, the geriatric approach should go beyond conventional strategies, with a curative focus, aimed at the promotion of mental health and the prevention of the occurrence of depressive symptoms, with the proper identification of health problems and related risk factors[4,7-8].

It is essential to offer an approach aimed at healthy aging, to understand how the phenomena present themselves and to ensure the care of the needs of older adults from an integral and multidimensional perspective. The use of screening tools for depressive symptoms will not only help in identifying cases, but will also directly influence the planning and implementation of actions with a possible impact on the quality of life of the older adults[31].

Some limitations should be considered when reflecting on the results of this study. The research involved a sampling process, in which the external validity is limited and the results can be extrapolated only to a similar population. The identification of morbidities was performed by self-reporting, which may have led to an underestimation of the actual prevalence of conditions of morbidity and the assessment of cognitive ability according to

the opinion of family members. However, the present study has a sufficiently large sample to adjust the regression models to the main factors of clinical interest and used standardized instruments validated in Brazil.

## CONCLUSION

The present study identified a high prevalence of depressive symptoms in older adults treated at a Referral Center in northern Minas Gerais. The results of this study show the need for an effective and immediate approach from health professionals in relation to older adults who especially exhibit a negative perception of their own health; frailty; who have suffered falls; were hospitalized in the previous year; who are unable to perform IADLs and who reside alone. Further studies are needed in this area, and may contribute new scientific evidence that will allow early and effective interventions focusing on the mental health of older adults.

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Original Articles

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# Polypharmacy in community-based older adults: results of the Fibra study

Priscila de Paula Marques[1] ID
Daniela de Assumpção[1] ID
Roseli Rezende[1] ID
Anita Liberalesso Neri[1] ID
Priscila Maria Stolses Bergamo Francisco[1] ID

## Abstract

*Objectives:* To estimate the prevalence of polypharmacy among older adults (≥65 years); to verify its association with sociodemographic variables, nutritional status and health conditions; to describe the prevalence of polypharmacy according to the presence of specific chronic diseases, and to report the method of acquiring drugs. *Method:* A cross-sectional study was performed with older adults (n=2,217) from seven Brazilian municipal regions. The prevalence of polypharmacy and its 95% confidence intervals were estimated. Associations were verified using Pearson's Chi-squared test with a significance level of 5%, and the independent associations between the selected variables and polypharmacy were verified by multiple hierarchical Poisson regression. *Results:* The prevalence of polypharmacy was 18.4% (CI95%:16.8-20.0), and was significantly lower among non-white individuals, those who did not have a health plan, and those who assessed their health as very good/good ($p<0.05$). Obesity: (PR=1.36; CI95%:1.06-1.75), increased waist circumference (PR=1.54; CI95%:1.08-2.20) and presence of two (PR=2.24; CI95%:1.52-3.31) or three or more (PR=4.22; CI95%:2.96-6.02) chronic diseases were positively associated with polypharmacy. Polypharmacy was observed in about 30.0% of older adults with heart disease, diabetes *mellitus* and/or strokes/CVA/ischemia. The frequency of older adults who acquired drugs in Basic Health Units was 20.3% and those who obtained them via their own/family resources was 13.5%. *Conclusion:* Among older adults, the identification of segments with a higher prevalence of polypharmacy enables a better structuring of the provision of treatment during their care pathway, allowing special attention to be paid to problems related to the use of drugs.

Correspondence
Priscila de Paula Marques
enf.primarques@gmail.com

## INTRODUCTION

Aging is a dynamic and progressive process that involves morphological, functional and biochemical disorders, with older adults frequently presenting simultaneous dysfunctions in different organs or systems[1]. Data from the National Health Survey (or PNS) show that 54.1% of older adults (60 years and over) had a chronic disease, 47.1% two such illnesses and 33.2% three or more[2]. With the occurrence of multiple chronic diseases, there is a significant increase in the simultaneous use of five or more drugs (polypharmacy)[3-5], the prevalence rates of which are 13.0, 37.0 and 60.0% in Brazilian older adults with two, three and four or more diseases, respectively[6].

Drugs play a central role in health treatment and recovery and are one of the most important items in the health care of older adults, however, even in necessary situations, the simultaneous use of several drugs can trigger serious complications[1,7]. Pharmacological redundancy, inappropriate medication prescriptions, potentially dangerous drug interactions, the increased risk and severity of adverse reactions, cumulative toxicity, iatrogenesis, lower adherence to treatment, and hospitalizations and deaths are widely reported in literature[8-14]. Physiological changes in aging such as weight loss, the reduction of lean mass and increased fat mass increase the risk of adverse reactions[1].

Given the high prevalence of chronic diseases in older adults and the risks associated with the overuse of drugs[8,12], the definition of polypharmacy into specific subgroups may contribute to improving the pharmaceutical care offered in health services, improving patients' understanding of treatment and consequently, increasing therapeutic success[9,10,13].

The objective of the present study was therefore to estimate the prevalence of polypharmacy in older adults (65 years of age or older); verify its association with sociodemographic variables, nutritional status and health conditions; describe the prevalence of polypharmacy according to the presence of specific chronic diseases, and report the method of acquiring the drugs.

## METHOD

A cross-sectional study was performed with data from the Brazilian Older Adults Frailty (Fibra) survey, conducted between 2008 and 2009, with those aged 65 years and older residing in the urban areas of seven Brazilian cities.

Ninety census tracts were drawn in Campinas (São Paulo); 93 in Belém (Pará); 75 in Poços de Caldas (Minas Gerais); 62 in Ermelino Matarazzo (São Paulo); 60 in Campina Grande (Paraíba); 60 in Parnaíba (Piauí) and 27 in Ivoti (Rio Grande do Sul). For each location, male and female quotas were estimated by age group (65-69, 70-74, 75-79, and ≥80 years), based on the percentage distribution of these segments in the older adult populations living in urban areas[15].

For Campinas and Belém, cities with more than one million inhabitants, a minimum sample size of 601 older people was estimated, considering a sampling error of 4 percentage points. For the other cities, which had less than one million inhabitants, samples of 384 older adults were estimated, with an error of 5%. In Ivoti, where 646 older people lived, the estimate was 235 people, with a sampling error of 5%[15].

Subsequently, older adults were recruited in their homes through an approach by pairs of duly trained and identified interviewers. The recruiters visited all the households in the census tracts drawn to identify older adults who met the inclusion criteria: age ≥65 years, understand the instructions, agree to participate in the survey, and be a permanent resident in the household. The exclusion criteria were the presence of problems with memory, attention, spatial and temporal orientation and communication, which were suggestive of cognitive deficits; permanent or temporary disability in walking (except those who used walking aids); localized loss of strength and aphasia as a result of stroke sequelae; severe impairment of motricity, speech or affectivity related to Parkinson's disease; severe hearing or visual impairment; and terminal stage diseases[15]. The inclusion and exclusion criteria were based on Fried et al.[16] and Ferrucci et al.[17].

Data were collected through a previously tested instrument, with validated questions, in a single meeting at defined locations, such as schools, churches, primary healthcare units, clubs and social centers. Undergraduate and postgraduate students received previous training in the application of the questionnaire on different days and times, which lasted from 40 to 120 minutes[15]. Older adults were informed about the research objectives and confidentiality of individual data, and were asked to sign a Free and Informed Consent Form.

The first part of data collection was organized into five blocks related to demographic and socioeconomic, anthropometric, blood pressure, frailty and cognitive screening variable data, each administered by an interviewer. Upon completing the last block of the first phase, the interviewer checked the score of the older adult on the Mini Mental State Examination (MMSE) to exclude those with cognitive impairment. The second part of data collection was performed with older adults who achieved a score higher than the MMSE cutoff score of 17 for illiterate individuals; 22 for those with one to four years of study; 24 for those who had between five and eight years of schooling and 26 for those who had studied for nine years and over[15,18]. Thus, at this stage, questions about chronic diseases, signs and symptoms, sleep problems, drug use, self-assessment of health, smoking and drinking, access to health services, among others, were applied[15].

In the present study, the variable of interest was the simultaneous consumption of five or more drugs, a condition that characterizes the practice of polypharmacy. A systematic literature review indicated few studies that used numerical definitions of polypharmacy and incorporated the duration of therapy, and a lower frequency of studies that used definitions which considered the health environment[19]. Although there is no universally accepted definition of polypharmacy[6,13,19], most Brazilian and non-Brazilian studies consider it to mean the use of five or more drugs. Thus, for comparative purposes, we have chosen to adopt this definition. The variable was obtained through the question: "*In the last three months have you taken any drugs prescribed by a doctor, or on your own?*" (yes or no). To those who answered yes, the question: "*How many?*" was asked.

For the older adults who answered the questions (n=2,217), the following variables were considered for the analysis of the factors associated with polypharmacy:

- Demographic and socioeconomic status: sex (male and female), age group (65-69, 70-74, 75-79 and ≥80 years), skin color/race (white and non-white composed of black, brown (mixed race), yellow (Asian-Brazilian) and indigenous), marital status (with spouse and without spouse), education (no schooling, 1 to 4, and 5 years or more of schooling), per capita family income in minimum wages (<1, 1 to 3 and >3 ), health insurance affiliation (yes and no).

- Nutritional status: Body Mass Index (BMI) calculated with weight and height measurements [weight (kg)/height (m$^2$)] and classified according to the cutoffs adopted by Lipschitz[20]: underweight BMI <22 kg/m$^2$, normal weight BMI between 22 and 27 kg/m$^2$ and overweight BMI>27 kg/m$^2$. The waist circumference (WC) measurement corresponded to the midpoint between the lower edge of the last rib and the iliac crest, classified according to the World Health Organization[21]: increased WC≥94 cm and <102 cm for men, ≥80 cm and <88 cm for women; greatly increased WC ≥102 cm and ≥88 cm for men and women, respectively.

- Health conditions: self-rated health (very good/good, fair, poor/very poor), hospitalization in the 12 months prior to the interview (yes and no), number of chronic diseases diagnosed by a doctor (0 to 1, 2, and 3 or more), sleep problems (yes and no), loss of appetite (yes and no) and frailty. For the classification of older adults in terms of frailty, the five criteria proposed by Fried et al.[16] were used to categorize the older adults as frail (positive for three or more criteria), pre-frail (positive for one or two criteria) and not frail (no positive criteria). Certain chronic diseases were also considered: hypertension, diabetes mellitus, heart disease (angina, myocardial infarction or heart attack), stroke/ischemia, depression, arthritis/rheumatism, osteoporosis, malignant tumor/cancer and lung disease.

The older adults who said they were using drugs, were asked, "*How do you access the drugs*?", and could respond buy with own money (yes or no), buy with family resources (yes or no) and obtain at Basic Health Unit (yes or no). Thus, from these questions, a variable was created considering only older adults who answered all (n=1,988), with two categories regarding the form of obtaining the drugs (own/family resources or free), discriminating the different profiles (mutually exclusive categories) to verify the association with polypharmacy.

In the analyzes, the relative percentage frequencies and the prevalence of polypharmacy were estimated according to sociodemographic characteristics, nutritional status and health conditions. The associations between polypharmacy and the variables considered were verified by Pearson's chi-squared test, with a significance level of 5%. Crude prevalence ratios and the respective 95% confidence intervals (95% CI) were also estimated.

Multiple hierarchical analysis was performed in three steps, with all the variables that presented $p<0.20$ in the simple analysis included in the model. Thus, in the first stage, sociodemographic variables were inserted and those with $p<0.05$ remained in the model. In the second stage, the variables related to nutritional status were inserted while the third included the variables related to health conditions, adopting the same criteria described in the first stage.

Statistical analysis was performed using the Stata program, version 14.0 (Stata Corp., College Station, USA). The Fibra Study was approved by the Research Ethics Committee of the Faculty of Medical Sciences of the Universidade Estadual de Campinas (the State University of Campinas) under opinion No. 208/2007 and registered on the Plataforma Brasil (the Brazil Platform) under CAAE number 39547014.0. 1001.5404.

## RESULTS

The sample of the present study consisted of 2,217 older adults who reported using drugs. The average age of the older adults was 72.4 years (95% CI: 72.2-72.7) and 67.6% were women. The average number of drugs used was 2.9 (95% CI: 2.8-3.0). The prevalence of polypharmacy was 18.4% (95% CI: 16.8-20.0), and was lower in non-whites and those without health insurance at the time of the survey. There was an increase in the prevalence of polypharmacy as schooling increased ($p<0.05$) (Table 1).

Table 2 shows the prevalence and prevalence ratios according to nutritional status and health conditions. Except for sleep problems and loss of appetite, all the other variables were associated with polypharmacy ($p<0.05$). The prevalence of polypharmacy according to specific chronic diseases is shown in Figure 1. About 30.0% of older adults with heart disease, diabetes mellitus and stroke/CVA/ischemia used five or more drugs at the time of the survey ($p<0.05$).

The results of the hierarchical regression analysis are shown in Table 3. The prevalence of polypharmacy was significantly lower in non-white people, among those without health insurance, and among those who self-rated their health as very good/good ($p<0.05$). Obesity, greatly increased waist circumference, and the presence of two or more chronic diseases were positively associated with polypharmacy ($p<0.05$).

**Table 1.** Sample distribution, prevalence and prevalence ratio of polypharmacy in community-dwelling older adults (≥65 years) according to sociodemographic variables. Fibra Study, 2008/2009.

| Variables | n (%) | Prevalence | p* | PR** (CI95%) |
|---|---|---|---|---|
| Sex | | | 0.094 | |
| Female | 1.498 (67.6) | 19.4 | | 1 |
| Male | 719 (32.4) | 16.4 | | 0.85 (0.68-1.05) |
| Total | 2.217 | 18.4 | | |
| Age range (in years) | | | 0.378 | |
| 65 to 69 | 818 (36.9) | 17.2 | | 1 |
| 70 to 74 | 705 (31.8) | 18.7 | | 1.09 (0.86-1.38) |
| 75 to 79 | 418 (18.9) | 21.0 | | 1.22 (0.94-1.59) |
| 80 years or more | 276 (12.4) | 17.0 | | 0.99 (0.71-1.37) |
| Skin color (self-reported) | | | < 0.001 | |
| White | 1.225 (55.8) | 22.0 | | 1 |
| Non-white | 971 (44.2) | 13.7 | | 0.62 (0.50-0.76) |
| Lives with partner | | | 0.946 | |
| Yes | 1.095 (49.5) | 18.4 | | 1 |
| No | 1.118 (50.5) | 18.3 | | 0.99 (0.82-1.21) |
| Schooling (in years of schooling) | | | 0.008 | |
| Never studied | 419 (18.9) | 13.8 | | 1 |
| 1 to 4 | 1.109 (50.1) | 18.3 | | 1.32 (0.99-1.77) |
| 5 or more | 685 (30.9) | 21.3 | | 1.54 (1.14-2.09) |
| Family income (MW) | | | 0.001 | |
| <1 | 800 (23.0) | 18.4 | | 1 |
| ≥1 and ≤3 | 1.580 (45.4) | 15.4 | | 0.83 (0.64-1.09) |
| >3 | 1.097 (31.6) | 22.2 | | 1.21 (0.93-1.56) |
| Health plan | | | < 0.001 | |
| Yes | 877 (40.1) | 23.9 | | 1 |
| No | 1.310 (59.9) | 14.7 | | 0.61 (0.51-0.75) |

n: total number of individuals in sample; MW: minimum wage at time of study; * Pearson chi-squared test;**PR: prevalence ratio; CI95%: confidence interval of 95%.

**Table 2.** Prevalence and prevalence ratio of polypharmacy in community-dwelling older people (≥65 years) according to nutritional status and health conditions. Fiber Study, 2008/2009.

| Variables | n (%) | Prevalence | p-value* | PR** (CI95%) |
|---|---|---|---|---|
| Body Mass Index (kg / m2) | | | <0.001 | |
| Normal weight | 870 (39.2) | 14.5 | | 1 |
| Underweight | 224 (10.1) | 11.2 | | 0.77 (0.50-1.18) |
| Overweight | 1.123 (50.7) | 22.9 | | 1.58 (1.28-1.95) |
| Waist circumference | | | <0.001 | |
| Normal | 553 (24.9) | 11.0 | | 1 |
| Increased | 565 (25.5) | 16.8 | | 1.52 (1.10-2.10) |
| Greatly increased | 1.099 (49.6) | 22.9 | | 2.08 (1.57-2.75) |

to be continued

Continuation of Table 2

| Variables | n (%) | Prevalence | *p*-value* | PR** (CI95%) |
|---|---|---|---|---|
| Health self-assessment | | | 0.001 | |
| Poor/ very poor | 643 (29.2) | 22.4 | | 1 |
| Regular | 854 (38.7) | 18.5 | | 0.83 (0.66-1.03) |
| Very good / good | 708 (32.1) | 14.7 | | 0.66 (0.51-0.84) |
| Hospitalization in the last year | | | <0.001 | |
| No | 1.835 (83.4) | 17.0 | | 1 |
| Yes | 366 (16.6) | 25.4 | | 1.49 (1.18-1.88) |
| Number of chronic diseases | | | < 0.001 | |
| 0 to 1 | 624 (28.6) | 5.8 | | 1 |
| 2 | 621 (28.4) | 13.8 | | 2.40 (1.63-3.54) |
| 3 or more | 938 (43.0) | 29.6 | | 5.14 (3.63-7.27) |
| Frailty | | | 0.010 | |
| Not frail | 884 (39.9) | 16.1 | | 1 |
| Pre-frail | 1.166 (52.6) | 19.2 | | 1.20 (0.97-1.48) |
| Frail | 165 (7.5) | 25.4 | | 1.58 (1.12-2.24) |
| Sleep problems | | | 0.101 | |
| Yes | 1.124 (50.7) | 19.7 | | 1 |
| No | 1.091 (49.3) | 17.0 | | 0.86 (0.71-1.05) |
| Loss of appetite | | | 0.637 | |
| Yes | 558 (25.4) | 19.2 | | 1 |
| No | 1.636 (74.6) | 18.3 | | 0.95 (0.76-1.19) |

n: total individuals in sample;* Pearson's chi-squared test;**PR: prevalence ratio; CI95%: 95% confidence interval.



*Statistically significant associations (p<0.05).
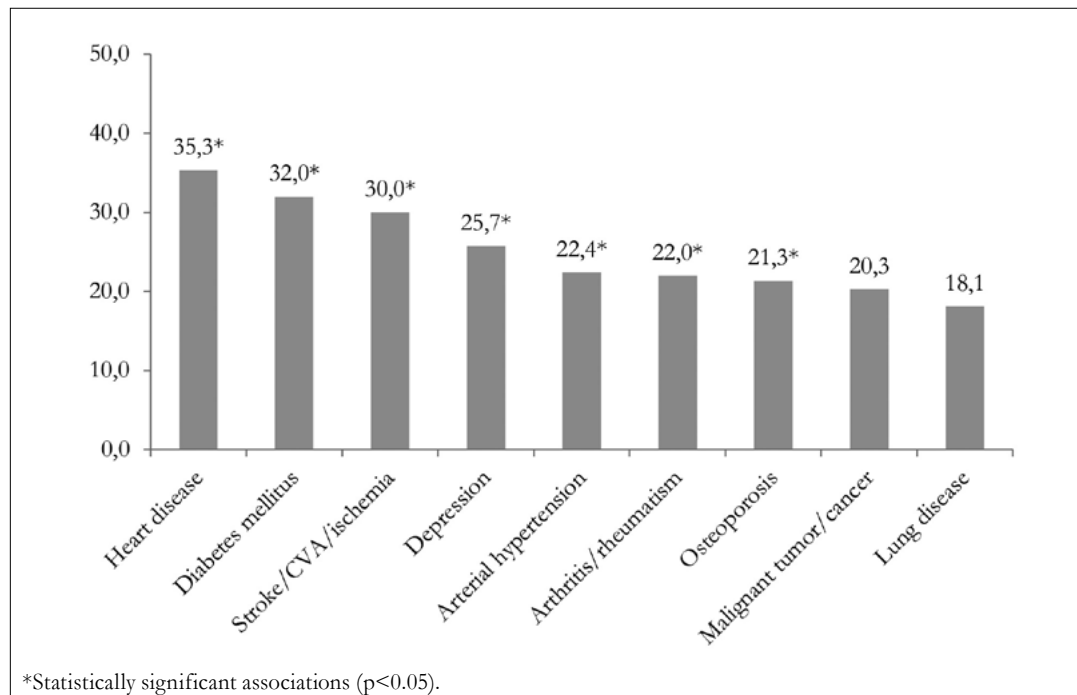
**Figure 1.** Prevalence of polypharmacy in older adults (≥65 years), according to the presence of chronic diseases. Fibra Study, 2008/2009.

**Table 3.** Poisson regression multiple hierarchical model for the association between polypharmacy and sociodemographic variables, nutritional status and health conditions in community-dwelling older adults (≥65 years). Fibra Study, 2008/2009.

| Variables | First stage<br>*PR$_{Adjusted}$<br>(CI$_{95\%}$) | Second stage<br>**PR$_{Adjusted}$<br>(CI$_{95\%}$) | Third stage<br>***PR$_{Adjusted}$<br>(CI$_{95\%}$) |
|---|---|---|---|
| Skin color | | | |
| White | 1 | 1 | 1 |
| Not white | **0.70 (0.56 - 0.86)** | 0.72 (0.58 - 0.90) | 0.70 (0.56 - 0.87) |
| Health insurance | | | |
| Yes | 1 | 1 | 1 |
| No | **0.67 (0.55 - 0.82)** | 0.67 (0.55 - 0.82) | 0.70 (0.57 - 0.86) |
| Body Mass Index (kg / m2) | | | |
| Normal weight | | 1 | 1 |
| Underweight | | 0.94 (0.59 - 1.50) | 0.93 (0.58 - 1.49) |
| Overweight | | **1.36 (1.06 - 1.75)** | 1.21 (0.94 - 1.56) |
| Waist circumference | | | |
| Normal | | 1 | 1 |
| Increased | | 1.28 (0.90 - 1.83) | 1.20 (0.84 - 1.72) |
| Greatly increased | | **1.54 (1.08 - 2.20)** | 1.32 (0.92 - 1.90) |
| Health self-assessment | | | |
| Poor/very poor | | | 1 |
| Regular | | | 0.89 (0.71 - 1.13) |
| Very good/good | | | **0.76 (0.58 - 0.99)** |
| Number of chronic diseases | | | |
| 0 to 1 | | | 1 |
| 2 | | | **2.24 (1.52 - 3.31)** |
| 3 or more | | | 4.22 (2.96 - 6.02) |

*Adjusted by sociodemographic variables;**Adjusted by sociodemographic variables and nutritional state; ***Adjusted for sociodemographic, nutritional and health status variables; PR: Prevalence ratio adjusted by Poisson multiple regression.

Regarding the form of drug acquisition, the frequencies of polypharmacy among those who reported obtaining their drug at the Basic Health Unit and through their own/family resources were 20.3% and 13.5%, respectively (*p*<0.001). Adjusting for sex, age and number of chronic diseases, the association was at the limit of statistical significance (PR=1.27; 95% CI: 1.00-1.61) (data not shown in table).

## DISCUSSION

In the present study, the prevalence of polypharmacy was 18.4% for older adults aged ≥65 years. Considering the same definition adopted in this study (use of five or more drugs), Brazilian surveys that used the age group of 60 years or older detected prevalences of 10.3% in Cuiabá (Minas Gerais)[22], 28.0% in Goiânia (Goiás)[23] and 32.0% in Florianópolis (Santa Catarina)[24]. In the National Survey on Access, Use and Promotion of the Rational Use of Drugs (or PNAUM), the prevalence of polypharmacy was estimated at 18.0%[6]. Among the ≥65-year-old segment, the prevalence of the concomitant use of five or more drugs was 36.0% in the city of São Paulo, according to the SABE[25] Study, 39.0% in the United States in the National Health and Nutrition Examination Survey[26], 44.0%

in Sweden, in a three-year prospective cohort study[1], and 69.0% in Canada, with data from the National Prescription Drug Utilization Information System[27].

Comparisons between these prevalences should be made with caution, as the differences observed in drug use studies may be related to factors such as the recall period, age group, access to health services, the supply and prescription of drugs in different locations, as well as the context of the period in which the study was conducted, among others.

No differences were observed in the prevalence of polypharmacy by sex, contradicting the results of other studies. Considering the age group 65 years or older, women presented odds ratios of 1.80 (95%CI: 1.20-2.60) in the city of São Paulo[25] and 1.28 (95% CI:1.27-1.29) in Sweden[1]. Differences in sex were also observed in older adults aged 60 years and over, with a higher prevalence in women in Florianópolis[24], Goiânia[23] and Brazil-wide (20.1% versus 15.6%)[6]. Therefore, the relationship between polypharmacy and sex in the older adult population needs to be further clarified.

There was also no difference in the prevalence of polypharmacy in relation to age group, contradicting the findings of other studies[23,24]. In the PNAUM study, the prevalence of polypharmacy was higher in the 70 to 79 age group, compared to the 60 to 69 group, but there was no statistical difference for the oldest older adults ($\geq$ 80 years old)[6]. In Sweden, a three-year follow-up study (age$\geq$65 years) found differences in the prevalence of polypharmacy: 32.8% (65 to 74 years), 53.0% (75 to 84 years), 65.5% ( 85 to 94 years) and 67.0% ($\geq$ 95 years)[1].

It should be considered that the selecting of older people without cognitive impairment, as well as the request that they get to the data collection site by their own means, may have inserted some selection bias into the study due to the majority who participated in the study being physically, emotionally and cognitively robust at the time it was carried out.

In the present study, the prevalence of polypharmacy was significantly lower among non-whites, unlike the results of other studies that found no association between polypharmacy and skin color[23,28]. This could indicate less access to diagnosis

and treatment in health services, and also lower purchasing power when obtaining the drugs, as well as the lower survival rates of such older people.

The prevalence of polypharmacy was lower among older adults who did not have health insurance. The PNAUM survey also identified a lower prevalence of polypharmacy in older adults who did not have private health insurance (16.8% versus 22.2%)[6]. In the city of São Paulo, the use of five or more drugs was lower in older adults treated by the public health network[25]. In Cuiabá (Mato Grosso), on the other hand, older adults who used public health services were more polymedicated[22]. Chronic diseases affect older people and people with low purchasing power, conditions that result from less access to and use of health services[29]. According to the SABE Study, about 70.0% of older adults without health insurance had no schooling and 58.7% of women and 81.6% of men received less than one minimum wage. Regarding the use of services, 51.7% of older adults without a health plan waited more than 90 days between the scheduling of an appointment and the appointment itself, 74.6% waited more than one hour to be seen, and 61.3% did not undergo or underwent only part of the exams requested after an appointment[30].

Greater levels of schooling were not associated with a higher prevalence of polypharmacy, corroborating the findings of other studies which did not observe a statistical association between schooling and excessive drug use[6,22-24]. In the SABE study, no significant association was found between polypharmacy and educational level, but a higher prevalence was identified among older adults who belonged to the upper tercile of minimum wage income distribution (37.2%)[25]. In contrast to the results of this study, in a prospective cohort of Swedish older adults, there was a lower prevalence (35.6%) and incidence (17.9/100 person-years) of polypharmacy among those with a higher education[1].

The prevalence of polypharmacy was greater in the subgroups of older adults with waist circumference classified as greatly increased, and in those who were overweight. A study with older people from Goiânia (Goiás)[23] found, in bivariate analysis, a higher prevalence of polypharmacy in those with a

greatly increased waist circumference (34.6%). In the hierarchical model, polypharmacy was higher among the obese. Data from the PNAUM showed that 25.4% of obese older adults were polymedicated, a significantly higher rate than was estimated for those classified as underweight or normal weight[6]. A cross-sectional study conducted in European countries (older adults ≥75 years) found a higher risk of hyper-pharmacy (≥10 drugs) among obese individuals[31]. Obesity is a risk factor for the development of comorbidities and is associated with metabolic syndrome, which comprises a set of cardiovascular risk factors such as hypertension, diabetes, insulin resistance, hypercholesterolemia and central obesity, defined as the measurement of waist circumference[32]. The higher drug consumption among obese older adults or those with higher central fat deposition may therefore be due to comorbidities and metabolic changes associated with these conditions, as well as changes caused by body fat in drug absorption, distribution and metabolism[7].

The simultaneous consumption of five or more drugs was lower among older adults who considered their health very good/good, compared to those who considered it poor/very poor. According to PNAUM, the prevalence of polypharmacy was 11.6% in older adults who perceived their health as very good/ good, increasing to 22.4% and 36.8% among those who responded that it was fair and poor/very poor, respectively[6]. In the Epifloripa Older Adults study, the rate of polypharmacy was almost twice as high in those who negatively self-rated their health[24]. In Goiânia (Goiás), older people who considered their health to be poor were more polymedicated than those who answered very good/good[23]. A population-based survey of older people from Campinas (São Paulo) found that poor/very poor self-rated health was associated with worse living conditions and health and emotional aspects, such as a higher number of chronic diseases, health problems and limitations, and the absence of feelings of happiness and vitality[33]. Self-rated health status is an important indicator of morbidity and use of services, especially in older adults[33]. The accumulation of chronic diseases causes damage to physical health and demands greater use of drugs, which can affect individual well-being and impose a reorganization in the routine of older adults.

Older adults with two or more chronic diseases had a higher prevalence of polypharmacy. Other studies have indicated that the practice of polypharmacy increases with the number of chronic diseases[6,23]. In Goiânia, the prevalence of the concomitant use of five or more drugs was 48.2% and 57.9% among older adults who had two or three or more chronic diseases, respectively.[23]. In Swedish older people (age ≥65 years), the prevalence of polypharmacy increased sharply with the number of chronic diseases, from 28.6% (one) to 45.4% (two) and 59.9% (three), reaching 87.2% among those with five or more diseases[1].

Older adults diagnosed with heart disease, diabetes mellitus, stroke/CVA/ ischemia, depression, hypertension, arthritis/rheumatism and osteoporosis had a higher prevalence of polypharmacy. In the SABE study a higher prevalence of polypharmacy was observed in older adults who reported diabetes, heart problems, rheumatic disease and hypertension[25]. According to the PNAUM findings, high blood pressure, diabetes, heart disease, lung disease, high cholesterol, rheumatism and depression were associated with polypharmacy[6].

In relation to the acquisition of drugs, among the older adults who reported such information, a higher percentage of polypharmacy was observed, within the limit of significance, among those who acquired their drugs from a Basic Health Unit (free of charge), which may indicate both greater access to drugs for individuals with chronic conditions receiving care in public health services, as well as for those who have a medical health plan, since the National Drugs Policy, through the National List of Essential Drugs (Rename)[6,34], guarantees the free of charge access to a group of drugs used by older adults with the most frequent chronic conditions [6].

National Health Survey (or PNS) data for the adult population as a whole reveal that 81.4% of total hypertensive patients were receiving drug-based treatment, 92.2% of those over 75 years of age; 80.2% and 52.0% of those who reported suffering from diabetes and depression, respectively, and 81.5% of those with asthma[35].

In addition to access to the drugs necessary for the treatment of the various chronic conditions that most often affect older adults, constant medical

monitoring should be provided for the reevaluation of the clinical profile of the individual and adjustments, if necessary, to a prescription. The training of the multidisciplinary health team on the adoption of strategies for the rational use of drugs[36] is also important, to minimize health risks and improve quality of life.

Drug therapy is essential for the control and treatment of the diseases and comorbidities that manifest themselves with aging, however, the unnecessary and abusive use of drugs needs to be addressed through alternative strategies to often essentially prescriptive biomedical practices. The joint work of physicians and pharmacists is of fundamental importance in many cases. In addition, in the context of public health services, the use of Complementary and Integrative Medicine, offered free of charge in over 3,000 municipalities, 88% of which is provided via Primary Health Care (PHC) establishments of the Unified Health System[37] should be considered, as well as multidisciplinary care involving nutritionists, physiotherapists, occupational therapists and physical educators, among others with a broad and more resolute approach. These care strategies can contribute to the reduction of polypharmacy and improve the quality of life of older adults.

Among the limitations of the present study is the fact that the data relate to the period from 2008 to 2009. In terms of nutritional status, it should be noted that BMI does not differentiate muscle tissue from adipose tissue, nor does it evaluate the distribution of body fat. In addition, the progressive loss of lean mass in older adults affects its validity as an indicator of adiposity, regardless of changes in weight[38]. Also, information on the amount of drugs used may be influenced by memory bias, and the specific drugs used by the polymedicated older adults were not verified. In addition, the healthier profile of the selected older adults may have underestimated the prevalence of polypharmacy.

In the Fibra study, men and women from four age groups (65-69, 70-74, 75-79 and 80 years and older) were recruited in proportion to those observed in the same age and sex groups of the urban population of the selected cities at the time of the study. However, discrepancies observed between the estimated and the obtained quotas may limit the generalization of the results to the wider population[15]. Among the strengths of the study is the methodological rigor of the Fibra Study, designed to obtain a broad set of information on the health conditions of older adults[15].

## CONCLUSION

The results of the present study indicated that 18.4% of older adults used five or more drugs. The segments of white older adults, who had health insurance, were overweight, had a greatly increased waist circumference measurement, who evaluated their health as more negative and who had two or more chronic diseases, were more likely to practice polypharmacy. It is important to identify those subgroups of older adults with a higher prevalence of polypharmacy, for more frequent monitoring and evaluations, to avoid any problems related to the interference of drugs in the therapeutic results and quality of life of such adults.

There was also a higher percentage within the limits of statistical significance in those who reported acquiring drugs from Basic Health Units, regardless of sex, age and number of chronic diseases, which may indicate greater access to drugs in the Unified Health System, but also little appreciation of other non-drug therapeutic practices for the care of older adults, even in the public health service.

Finally, it should be pointed out that there has been a notable expansion of health needs due to the rapid and progressive aging of the Brazilian population. In this sense, health care for older adults needs to consider multidimensional needs in a more integrated manner. The results of this study can be used to guide joint actions between doctors, pharmacists and other health professionals for the treatment of older adults, in order to reconcile the necessary use of drugs with health conditions and other non-pharmacological therapies.

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Review Articles

1 of 14

# Effect of physical exercise on cardiometabolic parameters in post-menopause: an integrative review

Rafaela Dias Rodrigues[1]  ID
Brenda Lemos Carvalho[2]  ID
Gleisy Kelly Neves Gonçalves[3]  ID

## Abstract

*Objective:* To identify the evidence available in literature which relates the practice of physical exercise to improvements in the cardiovascular and metabolic parameters of postmenopausal women. *Method:* A search was performed of works published between 2008 and 2018 included in the MEDLINE, BDENF, IBCS and LILACS databases. Of the 792 studies identified, 23 met the inclusion criteria. *Results:* Following analysis, the studies were separated into three categories. In the first category it was observed that physical exercise improved lipid metabolism, reduced abdominal circumference and promoted weight loss. The second category revealed that physical exercise reduced systolic blood pressure, prevented the development of arterial hypertension and reduced the release of sympathomimetic hormones. In the third category the studies indicated that physical exercise elevated the antioxidant mediators and reversed the oxidative stress involved in the inflammatory reactions present in cardiovascular diseases. *Conclusion:* The studies confirm the beneficial effects of physical exercise on the metabolic and cardiovascular parameters of postmenopausal women.

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[1] Hospital Sofia Feldman, Programa de Pós-graduação em Enfermagem Obstétrica. Belo Horizonte, MG, Brasil.

[2] Hospital Mater Dei, Programa de Pós-graduação em Treinamento em Serviço da Rede Mater Dei de Saúde. Belo Horizonte, MG, Brasil.

[3] Faculdade Ciências Médicas de Minas Gerais (FCMMG), Departamento de Enfermagem e Medicina. Belo Horizonte, MG, Brasil.

Correspondence
Gleisy Kelly Neves Gonçalves
goncalvesgk@gmail.com

## INTRODUCTION

In the premenopausal period, women have a lower prevalence of cardiovascular and metabolic diseases than men of the same age. In contrast, after menopause (50-59 years of age), there is a higher prevalence of these diseases in women, indicating that the hormonal transition present in menopause is an important risk factor for female morbidity and mortality[1]. Menopause is a phase of the life cycle that occurs in women at the age of 51 and is characterized by amenorrhea for at least 12 uninterrupted months[2]. The postmenopausal period is divided into two phases: an initial phase, which occurs in the first four years after the cessation of menstruation, with women more prone to irritability and frequent mood changes, and a late phase, starting from four years after the end of menstruation[3]. The postmenopausal period, whether early or late, is associated with several changes in the female body, which influence the development of health problems, promoting significant losses in the functioning of the body[2].

These imbalances may be temporary, such as the development of coronary artery disease, the loss of collagen and joint elasticity, osteoporosis, and the reduction of the sexual and reproductive functions of women. In addition, systemic disorders such as metabolic syndrome frequently occur[4]. This syndrome is defined as a set of metabolic changes that generate successive dysfunctions in lipid and glycemic levels, promoting the development of diseases such as visceral fat deposition (central obesity), insulin resistance and dyslipidemia. Hypoestrogenism is one of the causes related to the onset of metabolic syndrome, altering endocrine metabolism, with consequences for body weight gain, selective fat deposition and changes in lipid profile[5].

The mechanisms that promote reduced estrogen plasma levels have not yet been clearly elucidated. However, research has indicated that estrogen plays an important role in the uptake of low-density lipoprotein (LDL) cholesterol by the liver, reducing their circulating values[5,6]. Estrogen also promotes increased lipoprotein lipase activity, an enzyme that increases fat lipolysis and contributes to reduced fat accumulation and triglyceride levels[6]. This chain of events promotes increased risks for cardiovascular and metabolic diseases, directly affecting the quality of life of women.

From this perspective, it is vital to promote proper care for women at this stage of life, based on care plans that encourage non-pharmacological methods such as regular physical exercise. In this context, physical activity is defined as any movement of the body generated by the contraction of the skeletal muscles, which raises energy expenditure above the resting metabolic rate. In 1985, meanwhile, Caspersen defined physical exercise as a subcategory of physical activity, which is planned, structured and repetitive, and favors the maintenance or development of physical fitness[7]. In the present study, therefore, we considered physical exercise in the cardiovascular and metabolic context of postmenopausal women.

Physical exercise has a beneficial effect on women's health, and contributes to well-being and quality of life[6]. It is considered an important strategy for increasing daily energy expenditure, controlling the basal metabolic rate, contributing to the improvement of physical conditioning and the maintenance of lean mass[8]. It is therefore essential that health professionals understand the impact that physical exercise has on metabolic and cardiovascular parameters, with the aim of increasing the appreciation of this strategy and improving the quality of related activities during care.

The aim of the present review was therefore to analyze the evidence available in literature that relates the practice of physical exercise to improvements in cardiovascular and metabolic parameters in postmenopausal women.

## METHOD

An integrative literature review was conducted in six steps: 1.Creation of the guiding question: *What scientific evidence relates the practice of physical exercise to benefits for the cardiovascular system and metabolic rate of postmenopausal women?*; 2.Creation of the inclusion and exclusion criteria for scientific works and the establishment of databases; 3.Stipulation of information to be drawn from the selected studies; 4.Analysis and evaluation of articles included in the integrative review; 5.Interpretation and discussion

of results; and 6.Presentation of the review/synthesis of knowledge[9].

The bibliographic search was conducted using the guiding question from May to June 2018 through the Virtual Health Library, with access to the following databases: Medical Literature Analysis and Retrieval System Online (MEDLINE), Latin American and Caribbean Literature in Health Sciences (or LILACS), the Spanish Bibliographic Index of Health Sciences (or IBECS) and the Specialized Bibliographic Database in the Field of Nursing (or BDENF), from terms selected in the Descriptors in Health Science (DeCS) and the Medical Subject Headings (MeSH). The strategy combined the descriptors applying the Boolean operators AND; OR: climatério/climacteric/climatério; Exercício/Exercise/Ejercicio; Metabolismo/Metabolism; Sistema Cardiovascular/Cardiovascular System.

The included studies had the following characteristics: papers published in English, Portuguese and Spanish, from 2008 to 2018; complete scientific productions that presented summaries and information about the importance of physical exercise for the cardiovascular and metabolic parameters of postmenopausal women. Master and doctoral theses were excluded from the study.

The initial search identified a total of seven hundred and ninety-two (792) studies. After reading the titles and abstracts, twenty-seven (27) were found to be duplicates, seven hundred and six (706) did not answer the research question and one study (01) was not available in full. Thus, twenty-three (23) studies constituted the final sample of this review (Figure 1).

To validate the selection of studies for analysis, in the fourth phase of the study the articles were evaluated by two researchers using independent selection. The results of the fourth phase were compared and disagreements resolved by consensus among the reviewers. Of the seven hundred and ninety-two (792) studies evaluated at this stage, twenty-three (23) were selected by the two researchers and included. A total of fifteen (15) disagreements (11%) were identified among the reviewers and after reevaluation these articles were excluded due to not directly addressing the cardiovascular and metabolic parameters.
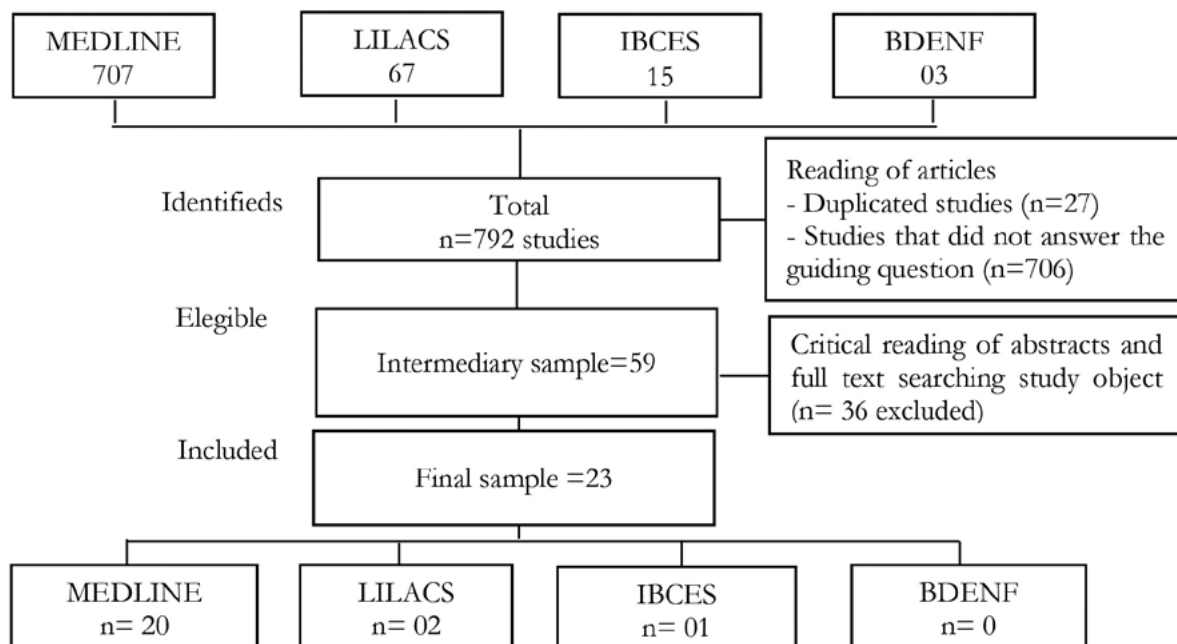


**Figure 1.** Study selection process flow. Belo Horizonte, Minas Gerais, 2018.

In the fifth phase of the review, the studies were analyzed and the data were grouped in an organized and synthesized manner through the construction of a synoptic table, containing the following data: title, authors, year, journal, location, level of evidence, objective, methodological design and main results. Moreover, following comparison of the studies that made up the final sample of the review, the primary scientific productions were grouped into three analytical categories: "Influence of physical exercise on the metabolism of menopausal women", "Effect of physical exercise on the prevention and control of systemic arterial hypertension" and "Physical exercise as a parameter to prevent cardiovascular risks in menopausal women".

The quality of the scientific productions in terms of Evidence Level (EL) was analyzed in order to identify the profile of the studies on the subject, with the publications grouped as follows: Level I. Evidence of meta-analysis of multiple randomized controlled trials; Level II. Evidence from individual studies with experimental design; Level III. Evidence from quasi-experimental studies; Level IV. Evidence from descriptive or qualitative studies; Level V. Evidence of case reports or experiences; level VI. Evidence from studies based on expert opinion[9].

The study took into consideration the ethical aspects of research, respecting the authorship and ideas in the publications included in the review.

## RESULTS

After applying the eligibility criteria, 23 articles were selected for discussion. Table 1 shows an overview of the studies analyzed by author(s)/year, level of evidence, objective, methodological design, sample and main results.

**Table 1.** Synoptic table of articles selected for the final sample. Belo Horizonte, (Minas Gerais), 2018.

| Author(s) | Level of evidence | Objective | Methodological design | Sample | Main results |
|---|---|---|---|---|---|
| Manuzet et al.[10] 2017 | I | to evaluate the effectiveness of organized exercise programs dedicated to sedentary older women. | Randomized controlled trial | Late postmenopausal women, >55 years (mean age 65 - 73 years), with no contraindications to exercise. | After two weeks of moderate intensity physical training, there was a significant improvement in metabolic (lipid) parameters and a reduction in SBP and DBP. In addition, there was a 10-year reduction in the risk of cardiovascular disease. |
| Mendoza et al.[11] 2016 | IV | Determine the benefits of exercise after menopause. | Descriptive Study | Early and late postmenopausal women, without a stipulated average age, from Spanish scientific societies related to the practice of physical exercise and menopause. | The literature demonstrates that the practice of synchronized physical exercise reduces the risk of bone fracture and acts on the cardiovascular system with reduced BP levels, as well as increased HDL levels. |

to be continued

Continuation of Table 1

| Gudmundsdottir et al.[12] 2013 | IV | To evaluate the association between physical activity and metabolic risk factors in premenopausal women. | Qualitative study | Two populations were selected: group 1 and 2 comprised premenopausal women with a mean age >40 years and group 3 comprised early and/or late postmenopausal women. | After 24 months of moderate intensity synchronized exercise, group 1 and 2 exhibited a weight reduction and HDL increase. Group 3 showed a reduction in weight, waist-hip ratio, triglycerides and LDL. In this context, the study demonstrated that physical exercise promotes many benefits in pre and post menopausal women. |
|---|---|---|---|---|---|
| Ohta et al.[13] 2012 | I | To examine the effect of bench exercise on PWV and the associated contribution of insulin resistance, bioactivity and NO. | Randomized controlled trial | Late postmenopausal women, mean age 65-85 years (excluding those with cardiometabolic and orthopedic disorders). Two groups were created: 1.Bench exercise group; 2.Control group. | After 12 weeks in the bench exercise group there was an improvement in BMI, SBP, fasting glucose, LDL and NO compared to the control group. |
| Novais et al.[14] 2017 | I | To examine the effects of aerobic exercise training on cGMP and NO levels in normotensive and treated hypertensive postmenopausal women. | Randomized controlled trial | Sedentary early and/or late menopausal women divided into two groups: 1.Normotensive women; 2. Treated hypertensive women. | After 24 sessions of aerobic exercise, group 2 showed an increase in fasting NO and an increase in cGMP concentration. In addition, both groups had reduced BP, body fat and triglycerides. |
| Lavoie et al.[15] 2013 | IV | To determine the synergistic associations between diet quality and exercise energy expenditure on cardiometabolic factors. | Qualitative study | Women in early and/or late postmenopause, overweight or obese, aged 46-70 years, without hormone replacement therapy. | After 24 weeks of synchronized low intensity exercise there was a reduction in cholesterol and an improvement in BMI, highlighting that the association of diet and exercise promotes a better quality of life in postmenopausal women. |
| Hernández-Angeles et al.[16] 2016 | IV | To analyze the effect of dietary counseling on the health of postmenopausal women. | Descriptive Study | Early and late postmenopausal women without a determined average age. | Study showed that regular, synchronized exercise combined with a healthy diet in postmenopausal women leads to weight reduction, visceral adipose tissue, and waist circumference. |

Continuation of Table 1

| Soto et al.[17] 2016 | I | To evaluate the influence of a physical exercise program on cardiovascular risk and quality of menopausal women. | Randomized controlled trial | Early and/or late postmenopausal women, aged 50-60 years, overweight and/or obese. | After three months of moderate intensity physical exercise and change in eating habits, there was a reduction in weight, BMI, fasting blood pressure and blood glucose and lipid profile. |
|---|---|---|---|---|---|
| Lesser et al.[18] 2016 | I | To assess changes in cardiometabolic risk factors in postmenopausal women in South Asia. | Randomized controlled trial | Early and/or late postmenopausal women, with an average of 50-60 years and overweight. | After 12 weeks of aerobic exercise there was a significant improvement in glucose and insulin levels in the body. In addition, there was a reduction in insulin resistance, which was identified by calculating the HOMA-IR index. |
| Zheng et al.[19] 2014 | I | To investigate the estimated total energy consumption and biomarkers associated with cardiovascular risks in menopausal women. | Randomized controlled trial | Late postmenopausal women, mean age 50-79 years. | After five years of follow-up of women with moderate intensity exercise, there was a significant reduction in the risk of several cardiovascular diseases. In addition, diet and exercise promotes a better quality of life for postmenopausal women. |
| Son et al.[20] 2007 | I | To examine the impact of combined resistance and physical training on blood pressure in menopausal women with hypertension. | Randomized controlled trial | Late postmenopausal women with an average age of 75 years and hypertensive divided in: 1.Control and 2. Moderate physical exercise. | After 12 weeks of moderate exercise the group 2 showed an improvement in functional capacity and body composition compared to the control group. |
| Casas et al.[21] 2012 | IV | To examine the individual and combined associations of leisure-time physical activity and sleep with cardiovascular risk factors in postmenopausal women. | Qualitative study | Late postmenopausal women with a mean age between 62 and 63 years old, normotensive and non-diabetic, divided into two groups: 1. Active women with a low-fat diet and good sleep quality (>7 hours); 2. Active women with poor sleep quality (<7hours). | After 48 months of moderate intensity exercise of up to 150 minutes/week, group 1 presented lower total body fat, triglycerides and fasting glucose than group 2. |

Continuation of Table 1

| Yoshizawa et al.[22] 2009 | I | To determine the effects of ingestion of lactic tripeptides and regular aerobic exercise on arterial compliance in postmenopausal women. | Randomized controlled trial | Early and late postmenopausal women aged 50-65 years were randomly divided into: group 1. Aerobic exercise with lactic tripeptide ingestion; and group 2. Women using placebo. | Eight weeks of regular aerobic exercise showed that there were no differences in baseline arterial compliance in group 1 compared with group 2. However, in group 1 there was a reduction in blood pressure and plasma angiotensin II concentrations. |
|---|---|---|---|---|---|
| Rodrigo et al.[23] 2015 | I | To analyze the influence of a strength exercise program on cardiovascular risk factors in postmenopausal women. | Randomized controlled trial | Late postmenopausal women (45-69 year old) at cardiovascular risk. Group 1. Using resistance exercises and group 2. Control. | After six months of resistance exercise in group 1, there was a reduction in blood pressure, as well as an improvement in arterial compliance and angiotensin II plasma concentrations when compared to group 2. |
| Lima et al.[24] 2011 | I | To evaluate the effect of an aerobic exercise program on blood pressure control in postmenopausal hypertensive women. | Randomized controlled trial | Late and early menopausal women without estimated average age. | After 12 weeks of aerobic exercise practice, there was a significant reduction in resting blood pressure from 30mmHg, in addition to the improvement in functional capacity of women undergoing the study. |
| Merino et al.[25] 2013 | I | Study the impact of a lower than recommended level of exercise on vascular function and in postmenopausal women. | Randomized controlled trial | Early and late postmenopausal women without an estimated average age, overweight and / or obesity. | After four months of low intensity exercise for 1 hour and twice a week there was an improvement in several parameters associated with cardiovascular health reducing the risk of cardiovascular disease, in addition to the increase in antioxidant enzymes. |
| Heeren et al.[26] 2008 | IV | Emphasize physical training as an important approach in reducing cardiovascular diseases in women after menopause. | Descriptive Study | Early and late postmenopausal women with no stipulated average age. | Adopting an active lifestyle with exercise and healthy eating habits promotes numerous benefits in reducing cardiovascular risks such as lowering blood pressure, lowering LDL levels and increasing HDL, as well as reducing body weight. |

to be continued

Continuation of Table 1

| | | | | | |
|---|---|---|---|---|---|
| Puga et al.[27] 2016 | I | To examine the effects of acute aerobic exercise-associated with administration of L-arginine on blood pressure in normotensive postmenopausal women. | Randomized controlled trial | Early and late postmenopausal women (average 57 years) and normotensive. There were two groups: 1. L-arginine + aerobic exercise; and 2.Control. | After the four experimental sessions it was possible to show that the group submitted to the use of L-arginine in line with aerobic exercise showed a reduction in the diastolic blood pressure levels through the reduction of sympathetic activity, release of vasodilator substances and among others, in relation to group control. |
| Figueroa et al.[28] 2015 | I | To investigate the effects of full body vibration training on ankle SBP in postmenopausal women. | Randomized controlled trial | Women in early postmenopausal, non-stipulated middle age, prehypertensive, hypertensive, overweight or obese. They were divided into two groups: 1. Body vibration training exercises; and 2. Control group. | After three weeks, group 1 showed a reduction in systolic blood pressure of the ankle compared to the group that underwent normal exercise only. |
| Arca et al.[29] 2014 | I | To compare the effect of aquatic exercise versus land-based training in menopausal hypertensive women. | Randomized controlled trial | Early and/or late postmenopausal women with no stipulated middle age and hypertension. They were separated into three groups: 1.Water exercises; 2.Exercises on land; 3.Control | After 12 weeks of exercise it was found that groups 1 and 2 had no differences in baseline blood pressure. Regarding SBP, there was a statistically significant reduction $\pm$ 18 mmHg in the aquatic exercise group and $\pm$ 10 mmHg in the land group. |
| Swift et al.[30] 2012 | I | To determine the effect of different intensities of aerobic exercise training on blood pressure in obese postmenopausal women. | Randomized controlled trial | Early and/or late postmenopausal women, with no stipulated average age, separated into: 1. Exercise group; and 2. Control. | After six months of moderate intensity exercise, it was found that group 1 had a reduction in diastolic blood pressure and body weight in comparison with group 2. |

to be continued

Continuação do Quadro 1

| Thomopoulos et al.[31] 2013 | IV | To analyze the role of exercise in the vascular system in menopausal women. | Qualitative study | Early and/or late postmenopausal women with no stipulated average age. | After three months of aerobic exercise it was shown that aerobic exercise has favorable effects on carotid artery compliance in postmenopausal women, in addition to reducing blood pressure levels, decreasing cardiovascular risks and promoting a better quality of life. |
|---|---|---|---|---|---|
| Rossi et al.[32] 2013 | I | To verify the effects of 16 weeks of aerobic and resistance combined training on cardiac autonomic modulation in menopausal women. | Randomized controlled trial | Early and/or late postmenopausal women with no stipulated average age. Divided into two groups: 1. Training group; and 2. Control group | After 16 weeks of aerobic and combined resistance training, group 1 showed an increase in parasympathetic system and reduction in sympathetic system compared to group 2. Training promoted benefits for autonomic modulation in women undergoing exercise. |

cGMP: cyclic Guanosine Monophosphate; HDL: High Density Lipoproteins; BMI: body mass index; LDL: Low Density Lipoproteins; NO: Nitric Oxide; BP: blood pressure; DBP: diastolic blood pressure; SBP: systolic blood pressure; PWV: Pulse wave velocity.

MEDLINE provided the most publications (90%), followed by LILACS (6%) and IBCES (4%). There was a predominance of the English language (87%, used in 19 publications), followed by two articles published in Portuguese and two in Spanish. Regarding the types of studies included, level of evidence I prevailed in 80% of the selected sample (19 randomized controlled clinical trials), followed by level IV in 20% (two literature review studies and five qualitative studies).

According to the results of this study, a mechanism that highlights the protective effect of continuous or intermittent regular exercise on the cardiovascular system provides beneficial changes, reducing cardiovascular risks and promoting a higher quality of life.

In menopause, there is a reduction in ovarian hormone production, which is related to the onset and aggravation of cardiovascular and metabolic diseases. Physical exercise inhibits the occurrence of such diseases by promoting weight loss, blood pressure control and anti-inflammatory and anti-oxidative effects.

## DISCUSSION

According to the analysis of the studies, physical exercise influences cardiovascular and metabolic parameters in a complex manner, allowing the creation of three thematic categories, namely: "The influence of physical exercise on the metabolism of postmenopausal women", "The effect of physical exercise on the prevention and control of systemic arterial hypertension" and "Physical exercise as a strategy for the prevention of cardiovascular risks in postmenopausal women". The largest number of studies were in the category "The effect of physical exercise on the prevention and control of systemic arterial hypertension" (37%) and "Physical exercise as a strategy for the prevention of cardiovascular risks in postmenopausal women" (37%) followed by the

category "The influence of physical exercise on the metabolism of postmenopausal women" (26%). The categories are presented below with their respective analysis and discussion.

## The influence of physical exercise on the metabolism of postmenopausal women

This category consists of seven publications[10-16] that address the effects of exercise on the metabolism of menopausal women. The authors mainly focused on the endocrine metabolism and the normalization of the body's hormones in order to improve the well-being of women under these conditions. Of the articles analyzed, four[10-13] addressed the contributions of physical exercise to the lipid metabolism, the reduction of waist circumference and weight loss. One study[11] demonstrated that regular exercise training over a three-month period resulted in a significant improvement in metabolic parameters, with a significant increase in HDL level, a significant reduction in LDL level, improved physical fitness and heart rate and diastolic blood pressure normalization, reducing cardiovascular risks over ten years when analyzed by the Framingham scale[10,11].

In addition, the studies[14,15] highlighted that performing exercise as a non-pharmacological intervention is a valuable therapeutic resource in postmenopausal women, acting positively in reducing visceral adipose tissue, waist circumference and BMI. It also promotes greater respiratory capacity, ensuring greater functional capacity and quality of life among these women. Somatic symptoms such as pain, weakness, fatigue and nausea were also less severe in this population, which reinforces the positive role of exercise in the climacteric and menopause periods[16].

Postmenopausal women who practice exercise and a nutritious diet were cited in two studies[15,16], reiterating that a nutrient-rich diet in association with exercise has a positive effect on modulating and reducing systemic inflammation, preventing the development and progression of atherosclerosis, as well as reducing the hepatic cholesterol content, providing positive regulation of the LDL receptor and increasing LDL cholesterol clearance[16]. One study[14]

emphasized that the combination of the daily intake of soy isoflavones (Mediterranean diet) and exercise reduces insulin resistance in postmenopausal women more effectively than each of these separate factors.

In this context, it is clear that lifestyle modification is more effective when there is association combination of diet and exercise, bringing improvements to the health of menopausal women. The same was true for improving the metabolism and quality of life in terms of women's general clinical condition and mental health.

## The effect of physical exercise on the prevention and control of systemic arterial hypertension

This category includes eight scientific productions[17-24] that related the practice of physical exercise to the management of the prevention and control of systemic arterial hypertension in postmenopausal women. Two scientific productions[17,18] identified that the performance of exercise programs by menopausal women significantly reduced systolic blood pressure, although changes in diastolic blood pressure were not observed. Such effects are associated with a reduction in adrenaline and norepinephrine secretion levels at rest and during effort, in addition to lower sympathetic tone activity[17].

The maintenance of sympathetic tone depends on the activity of the sympathetic premotor neurons, located bilaterally in the rostroventrolateral portions of the bulb that controls the sympathetic cardiovascular sites, such as the heart, blood vessels and adrenals. During physical exercise, sodium tubular reabsorption occurs, leading to lower sympathetic tone activity and, consequently, a reduction in blood pressure[17,18].

Other studies[19,20] emphasized that combined physical training (aerobic and anaerobic) promotes a reduction in mean arterial pressure and arterial stiffness, in addition to increasing nitrate levels in postmenopausal women with stage 1 hypertension and improving functional capacity and strength, with no adverse effects on BP. In addition, research has identified that combined exercise reduces systolic

and diastolic blood pressure by 9 to 12 mmHg respectively, demonstrating that physical exercise effectively controls BP[20]. Aerobic exercises play relevant roles in the control and prevention of hypertension[22,23] reducing blood pressure levels in postmenopausal women, as well as improving the functional capacity of hypertensive women. It is also noteworthy that these changes occurred regardless of the change in body fat percentage, measured by the abdominal circumference and BMI indicators[23,24].

Aerobic exercise is an effective alternative therapy for the treatment and control of a moderate blood pressure level. Exercises such as cycling, swimming, going up and down stairs, treadmills and light running promote satisfactory results in lowering blood pressure[8]. The mechanisms involved in reducing blood pressure through aerobic exercise are the reduction of sympathetic tone, increasing the sensitivity of the vascular β-2 adrenoreceptors, reducing the sensitivity of α adrenoreceptors, reducing the renin and aldosterone concentration levels, and increasing the release of natriuretic peptides by cardiac tissue[8].

Vasoactive substances present in the circulation or excreted from the endothelial cells participate in the regulation of blood pressure by controlling vascular tone, modulating peripheral vascular resistance and cellular remodeling[8,22]. Another beneficial effect of regular exercise on blood pressure control is that exercise stimulates NO secretion from the endothelial cells, causing vasodilation and controlling blood pressure in the short and medium term. NO promotes vascular smooth muscle relaxation, reducing vascular tone and blood pressure values[22].

Casas et al.[21] analyzed the effect of physical activity combined with diet and sleep quality in postmenopausal women. They used a moderate intensity exercise program for 150 minutes a week (not synchronized) in association with a low-fat diet and sleep quality over seven hours. The study found that women who are active in terms of physical activity, with good diet and good sleep quality, had lower total fat. However, there was no difference in terms of general biochemical characteristics and cholesterol level. It is noteworthy that the work of Casas et al. was the only study in our sample which

was not specifically about physical exercise. We used the term exercise in our search, and yet the study appeared, probably as it used exercise programs for menopausal women in its routines, but not systematized exercise.

From this perspective, it can be affirmed that regular exercise has beneficial effects for menopausal women, reducing blood pressure levels in hypertensive women and preventing its occurrence in normotensive women, contributing to an active and healthy aging, encouraging the well-being of women in this condition.

## Physical exercise as a strategy for the prevention of cardiovascular risks in postmenopausal women

This category consisted of eight studies[25-32] with results related to the cardiovascular benefits if regular exercise in menopausal women. Three studies[25-27] demonstrated that exercise in postmenopausal women results in the elevation of antioxidant system, measured by the enzymes superoxide dismutase and glutathione peroxidase. These enzymes are primordial in the oxidative stress process and necessary for the maintenance of life, since they prevent and control the excessive production of free radicals involved in the reactions that trigger the incidence of oxidative damage[26]. The studies stated that physical exercise reduces the levels of factors that initiate the process and progress of atherosclerosis, playing an important role in improving endothelial function[25].

It should be highlighted that the performance of physical presented numerous benefits, such as the reduced incidence and risk of strokes. Exercise reduces blood pressure levels and heart rate and improves the sensitivity of arterial pressoreceptors due to increased oxidative enzyme activity and reduced oxidative stress[26]. In addition, reinforcing the importance of physical exercise as a cardioprotective agent, studies observed[26-28] that postmenopausal women who exercise have greater arterial pressoreceptor sensitivity and lower heart rate variability when compared to sedentary menopausal women. These parameters are considered relevant for the occurrence of mortality from cardiovascular diseases[29].

Regarding arterial compliance, studies[29-31] showed that exercise improves this factor, reducing cardiovascular risk and blood pressure. One study[32] showed that the presence of polymorphism for the -786T>C position of the endothelial nitric oxide synthesis gene does not affect the basal levels of nitric oxide; however, when physical exercise is performed, nitric oxide concentration is reduced for women, with this polymorphism found in both normotensive and hypertensive women. Polymorphism is directly associated with cardiovascular diseases such as acute myocardial infarction and coronary artery disease.

Importantly, there are numerous benefits of exercise for reducing cardiovascular risk, especially for decreasing proinflammatory marker levels, increasing insulin sensitivity, and improving cardiopulmonary capacity[25-29]. Nitric oxide has appeared in several studies as a factor with an important role in the cardiovascular system, acting as a vasodilator. When regular exercise is performed, there is an increase in NO production by endothelial cells through shear stress, promoting vasodilating and antithrombotic effects[8].

In addition, it is noteworthy that synchronized physical exercise, as well as providing improvements in the cardiovascular system, contributes to metabolic improvement and the prevention of health problems. Studies[33,34] have shown that resistance exercise reduces total cholesterol levels, increases muscle strength, and significantly reduces interleukin-6, leptin and resistin serum concentration levels with minor effects on interleukin-15. These rates, when elevated at menopause, can promote chronic inflammation and may trigger the development and progression of conditions such as neurodegeneration, osteoporosis and atherosclerosis, directly affecting quality of life[34]. Resistance exercises have effects on the balance of proinflammatory gene transcription in skeletal muscle, stabilizing proinflammatory cytokine levels in muscle.

Thus, the anti-inflammatory benefits of resistance training are derived from an adaptation of transient changes in the number of proinflammatory mediators[34]. It is also noteworthy that aerobic exercise practiced by menopausal women reduces oxidative stress[34,35] andinsulin resistance, and it is likely that this change is related to changes in autonomic nervous system function[35]. Another important aspect is that aerobic exercises promote the prevention of fibrolytic function decline, responsible for the lysis of intravascular and intracardiac clots, preventing thrombus or embolisms[35,36].

In contrast, a single study[33] revealed that moderate exercise for postmenopausal women for 12 months worsened the vasomotor symptoms, although paradoxically fewer memory problems were reported. These authors explained that the occurrence of these symptoms is associated with a decrease in BMI, which leads to a reduction in the peripheral conversion of androgens from adrenal to estrone, aggravating vasomotor symptoms. However, they observed beneficial effects in other evaluated parameters, such as physical and psychosocial measures.

Blumenthal et al.[37] also observed a significant hypotensive effect on blood pressure with SBP decreases of 7.4 mmHg and DBP 5.6 mmHg after aerobic training over a period of twenty-six weeks[37,38]. In addition, three forms of non-pharmacological control are essential for the treatment of hypertension, such as: decreased body weight, synchronized physical exercise and reduced sodium intake[38]. Thus, performing regular physical exercises with frequency and intensity control is efficient in reducing blood pressure, as well as playing an important role in the cardiometabolic system[38].

The protective effect of regular, continuous or intermittent exercise on the cardiovascular system promotes beneficial changes by reducing cardiovascular risks, improving metabolic parameters, reducing the incidence of pathologies and promoting the maintenance of quality of life and well-being in postmenopausal women, as at this stage they exhibit anthropometric and biochemical changes.

The interpretation of the present study should consider that the available works on this theme has limitations, as, in general, they are not sufficiently clear about the postmenopausal period or the exercise program performed by women, factors that would influence the results. Still, the results of this study raise important discussions about the effects of physical exercise for postmenopausal women, supporting this practice as a strategy to promote quality of life.

## CONCLUSION

The practice of physical exercise in postmenopausal women brings benefits and prevents health problems, especially cardiovascular and metabolic diseases. Analysis of the works included in this study showed that physical exercise can promote the health benefits for postmenopausal women by improving the plasma lipid profile, controlling blood pressure and risk factors for heart disease. Other important effects are the psychological improvement and fitness acquired through this non-pharmacological strategy. Thus, it is essential that health professionals include the practice of physical exercise in their care strategies, promoting well being and preventing health problems for women.

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# The Palliative Care Screening Tool as an instrument for recommending palliative care for older adults

Maykel Gonçalves Santa Clara[1] ID
Valmin Ramos Silva[1] ID
Rosana Alves[2] ID
Maria Carlota de Rezende Coelho[1] ID

## Abstract

The objective of the present study was to evaluate the use of the Palliative Care Screening Tool (PCST) for the recommendation of palliative care among older patients admitted to an Intensive Care Unit, as well as to evaluate the prevalence of basic diseases, religion and agreement between the results of the PCST and the Palliative Performance Scale (PPS). A cross-sectional, descriptive, analytical, retrospective, documental study with a quantitative approach was performed. Analysis of 594 medical records revealed that cardiovascular diseases accounted for 26.8% of hospitalizations among older adults, followed by neoplasia 20.2% and renal failure 16.8%, and that aspects related to the religiosity and spirituality of the older adults were not considered. There was agreement of 1.0 between the PCST and PPS scales, as measured by the Kappa test, a score considered to be perfect. The PCST can therefore be considered an excellent tool for the evaluation of palliative care among older adults. It can be concluded that, in view of the significant level of agreement between the scales, new studies using the PCST with larger samples should be performed, with the aim of extending the use of the tool, and to assess if there is a need for adjustments aimed at adapting it more closely to the Brazilian population.

[1] Escola Superior de Ciências da Santa Casa de Misericórdia de Vitória, Pós-graduação em Políticas Públicas e Desenvolvimento Local, Departamento de Medicina. Vitória, ES, Brasil.

[2] Universidade Federal do Espírito Santo, Departamento de Pediatria. Vitória, ES, Brasil.

Correpondence
Maykel Gonçalves Santa Clara
maykelgsc@gmail.com

## INTRODUCTION

The practice of palliative care, despite being relatively recent, has as its cornerstone the integral treatment of the patient, the consideration of the finitude of life, respect for the patient's wishes, and the encouraging of therapy that aims to allow individuals to pass their remaining days with quality and dignity.

The beginning of the change in the approach to patient treatment, focusing on the individual rather than the disease, occurred in the 1960s with the advent of palliative care in the United Kingdom[1]. In 2002 the World Health Organization (WHO) defined palliative care, emphasizing the use and practices of measures to increase the quality of life of patients and their families[2]. In Brazil, according to a study conducted by the National Academy of Palliative Care (or ANCP) in 2018, there was a low number of palliative services in health institutions, which were unevenly distributed across the country[3].

The consequences of the situational diagnosis of palliative care in Brazil are: patients indicated for intensive care unit (ICU) admission being treated in wards, due to the lack of available beds, thus contributing to increased morbidity and mortality[4], the use, for patients with severe chronic comorbidities, of technologies which will not change the outcome and which increase the physical and psychological distress of patients and their families, resulting in the deterioration of the quality of death of the individual. *The Economist* magazine was emphatic in this regard when it assessed, in 2015, the quality of death in 80 countries, with Brazil ranking 42nd behind Chile (27th), Costa Rica (29th), Panama (31st), Argentina (32nd), Uruguay (39th), South Africa (34th), Uganda (35th), Mongolia (28th) ) and Malaysia (38th)[5].

The older adult population is responsible for most ICU admissions and is the largest beneficiary of the practice of palliative care in the world[6]. According to data from the National Continuous Household Sample Survey - Characteristics of Residents and Households, produced by the Brazilian Institute of Geography and Statistics (or IBGE), the older population increased by 4.8 million from 2012 to 2017, thus highlighting the continuing trend. of aging of the Brazilian population[7].

The World Report on Aging and Health, published by the WHO in 2015, highlighted the need to transform health systems from curative forms focused on disease towards the implementation of comprehensive care centered on older adults[8]. In this sense, the need to identify older adults who would benefit from palliative care is evident. The Center to Advance Palliative Care (CAPC) developed the Palliative Care Screening Tool (PCST) for the indication of palliative care based on the following criteria: underlying disease, associated diseases, patient's functional condition and patient's personal condition, ultimately resulting in the need or not for palliative care[9,10].

The Palliative Performance Scale (PPS) scale is widely used to indicate palliative care, allowing the patient prognosis and functionality to be established[11,12]. In the present study, we chose to use the PCST scale as we believe it is more comprehensive and, therefore, can accurately assess palliative criteria, with the aim of preventing patients indicated for palliative care suffering from therapeutic obstinacy, occupying ICU beds unnecessarily, and making them more likely to receive palliative care when indicated.

The aim of the present study was to evaluate the use of the PCST scale and assess its agreement with the PPS scale, as well as to describe the causes of hospitalization in older adults in palliative care, admitted to an Intensive Care Unit.

## METHODS

A cross-sectional, descriptive, analytical, retrospective, documentary study with a quantitative approach was performed[13]. Primary data were used, originating from the inclusion of 100% of the medical records of patients evaluated, aged over 60 years, admitted to the ICU of a state hospital in Espírito Santo, Brazil, in 2017. No exclusion criteria were applied. The hospital in question is a general hospital with 286 active beds, of which 40 are intensive care beds.

In September 2015, a Multidisciplinary Palliative Care Committee was established at the hospital, consisting of two doctors, a psychologist and a social worker, who are exclusive to the service. When necessary, the team can also call on the support of

a chaplain, dentist, speech therapist and nutritionist, among others.

The protocol for the inclusion of patients admitted to the ICU in palliative care flows as follows: the ICU duty physician requests an opinion from the palliative care committee based on clinical criteria, which then, using the PPS[11] scale, confirms or not the indication of palliative care. When palliative care is indicated for the patient, he/she is transferred to a hospital ward, or when the hospital has no vacant beds, remains in the ICU under palliative care.

Two scales were used as research instruments. One was the PCST (Table 1), created by the Center to Advance Palliative Care (2004/2007), through the policy document in accordance with the Joint Commission on Accreditation of Healthcare Institutions (JCAHO)[9]. The scale assesses four criteria: underlying disease, associated diseases, patient's functional condition, and patient's personal condition. When the score (the sum of the four criteria) is greater than or equal to four points, the individual is considered to be in a suitable condition for palliative care.

The indication or not of palliative care according to the PCST scale is based on the sum of the items and is characterized as follows: up to two points, no indication of palliative care; up to three points patient should be kept under clinical observation; equal to or greater than four points consider indication of palliative care.

The other instrument used, the PPS scale (Table 2), allows a prognosis to be established and the patient's functionality to be evaluated. This scale analyzes five parameters: mobility, activity and evidence of disease, self-care, ingestion and state of consciousness and assigns values from 0% to 100%, with 0% meaning death, and 100% meaning that the patient has no functional disorder. The PPS scale assesses the need for palliative care if the patient has a score below 40%[11,12].

**Table 1.** Palliative Care Screening Tool (PCST)[9,10]. NY, USA, 2007.

| |
|---|
| Criterion Number 1 - Baseline Diseases - Two Points for Each Subitem |
| 1. Cancer-metastasis or relapse |
| 2. Advanced chronic obstructive pulmonary disease (COPD) - repeated exacerbations |
| 3. Stroke (CVA) - reduction in motor function greater than or equal to 25% |
| 4. Severe renal impairment - creatinine clearance <10ml / min |
| 5. Severe heart failure - congestive heart failure (CHF) with left ventricular ejection fraction (EF) <25%, cardiomyopathy or significant coronary insufficiency. |
| 6.Other diseases limiting the patient's life |
| Criterion Number 2 - Associated Diseases - One point for each subitem: |
| 1. Liver disease |
| 2. Moderate Kidney Disease - creatinine clearance <60ml / min. |
| 3. Moderate COPD - stable clinical picture |
| 4. Moderate CHF - stable clinical picture |
| 5.Other associated diseases - all worth 1 point |
| Criterion Number 3 – Patient's Functional Condition |
| 1.Patient's functional condition - this criterion assesses the degree of disability of the patient, taking into account the ability to perform normal daily activities, acts of personal care and the number of hours confined to bed or wheelchair. |
| 2. Score ranges from 0 (fully independent, active, unrestricted patient) to 4 (fully dependent, needs full-time help, confined to bed or wheelchair). |
| Criterion 4 - Patient's personal conditions - one point for each subitem: |
| Patient's personal conditions - one point for each subitem: |
| 1. Needs help with complex treatment decisions and undefined psychological or spiritual issues. |
| 2. History of recent hospitalizations in emergency services. |
| 3. Frequent hospitalizations for decompensation of underlying disease |
| 4. Prolonged intensive care unit (ICU) admission or patient already in intensive care unit with poor prognosis |

Source: Table adapted by Lucchetti of the *Center to Advance Palliative Care* (CAPC). Brazil, 2009.

**Table 2.** Palliative Performance Scale (PPS)[11,12]. British Columbia, Canada, 2004.

| % | Items evaluated | | | | |
|---|---|---|---|---|---|
| | Ambulation | Activity and evidence of disease | Self-care | Ingestion | Level of consciousness |
| 100 | Full | Normal, without evidence of disease | Full | Normal | Full |
| 90 | Full | Normal, some evidence of the disease | Full | Normal | Full |
| 80 | Full | With effort, some evidence of the disease | Full | Normal | Full |
| 70 | Reduced | Unable to work, some evidence of the disease. | Full | Normal or reduced | Full |
| 60 | Reduced | Unable to perform hobbies, significant illness | Occasional assistance | Normal or reduced | Full or with periods of confusion |
| 50 | Mainly sit or lie down | Unable for any work, extensive illness | Considerable assistance | Normal or reduced | Full or with periods of confusion |
| 40 | Bed-bound | Idem | Almost complete assistance | Normal or reduced | Full or with periods of confusion |
| 30 | Bed-bound | Idem | Complete dependency | Reduced | Full or with periods of confusion |
| 20 | Bed-bound | Idem | Idem | Ingestion limited to sips | Full or with periods of confusion |
| 10 | Bed-bound | Idem | Idem | Mouth care only | Confused or in a coma |
| 0 | Death | - | - | - | - |

Source: Table adapted by palliative care manual. Brazil, 2009, from the *Victória Hospice Society*.

The variables studied were: 1) all of the topics contained in the PCST scale, 2) the sum of PCST scores during hospitalization, 3) request for opinion of the palliative care committee, 4) whether the patient was placed in palliative care, 5) religion, 6) agreement between the PCST and PPS scales. Nominal categorical variables were organized by frequency and percentages and numerical variables as means.

The Kappa test was used to verify agreement between the PCST and PPS scales, with the reference values being: <0 No Agreement, 0−0.20 Minimum Agreement, 0.21−0.40 Reasonable Agreement, 0.41−0.60 Moderate Agreement, 0.61−0.80 Substantial Agreement and 0.81−1.0 Perfect Agreement[14].

The analysis was performed considering a significance level of 5%, with $p$ values less than 0.05 considered significant.

The study was submitted to the Ethics Research Committee of the Santa Casa de Misericórdia de Vitória School of Science under protocol CAAE: 92777518.2.0000.5065 and approved under number Nº 7.793.152, following the provisions of CNS Resolution 466/12 regarding the requesting of a waiver of Informed Consent Forms.

## RESULTS

A total of 974 medical records were identified, corresponding to the total number of hospitalizations in 2017, of which 11 were excluded due to lack of data and 369 because they were from patients under 60 years of age. Thus, the final sample was 594 (61.6%) records. Of these, 44.5% were male and 55.5% were female, and the mean age was 75.2 years.

To highlight the prevalence of underlying diseases among older patients admitted to the hospital ICU, the location of the study, Table 3 was created. Of the 594 patient records, it was found that 268 (45.1%) were hospitalized due to decompensation of the underlying disease according to PCST criterion number 1 and 326 (55.9%) were hospitalized for reasons not associated with the underlying disease.

Cardiovascular diseases corresponded to 26.8% (sequelae of stroke and congestive heart failure) of

hospitalizations, followed by neoplasms (20.1%) and renal failure (16.8%).

In 2017, 74 patients were placed in palliative care, evaluated by the committee of the hospital studied, using the PPS scale. To assess the comprehensiveness of the PCST, it was applied to the 594 medical records of ICU patients, and the kappa coefficient of agreement between the PCST and PPS scales was calculated (Table 4). A total of 218 medical records of patients with a score greater than or equal to four were subsequently identified, as shown in Table 5.

**Table 3.** Basic illnesses of hospitalizations in intensive care units of Espírito Santo State Hospital, Brazil, in 2017 (N= 268).

| Underlying illnesses | Number (%) n (%) |
|---|---|
| Cancer | 54 (20.1) |
| Stroke Sequel | 50 (18.6) |
| Renal insufficiency | 45 (16.8) |
| Dementia | 36 (13.4) |
| Chronic obstructive pulmonary disease | 24 (8.9) |
| Cirrhosis | 23 (8.6) |
| Congestive heart failure | 22 (8.2) |
| Diabetes | 8 (3) |
| Neuropathy | 2 (0.8) |
| Advanced spondyloarthropathy | 1 (0.4) |
| Fistula | 1 (0.4) |
| Myelodysplastic syndrome | 1 (0.4) |
| Trauma sequelae | 1 (0.4) |
| Total | 268 (100) |

Source: Records of the intensive care unit of the State Hospital of Espírito Santo State, Brazil, in 2017.

**Table 4.** Kappa coefficient of agreement between the PCST and PPS scales for older patients evaluated by the palliative care committee (N=75), admitted to the intensive care units of the Espírito Santo State Hospital, Brazil, 2017.

| Palliative Care Screening Tool | Palliative Performance Scale | | |
|---|---|---|---|
| | Non-palliative | Palliative | Total |
| Request for opinion not required | 1 | 0 | 1 |
| Request for opinion required | 0 | 74 | 74 |
| Total | 1 | 74 | 75 |

Kappa agreement coefficient observed: 1.00, $p<0.0001$.

Source: records of the intensive care units of the Espírito Santo State Hospital, Brasil, 2017.

**Table 5.** Application of PCST and request for opinions/responses requested by the medical team, for older adults hospitalized in the intensive care units of the Espírito Santo State Hospital, Brazil, in 2017 (N=218).

| Opinion | PCST Score ≥4 Number (Percentage) n (%) | Confidence Interval |
|---|---|---|
| Opinion not requested | 115 (52.7) | 41.1 – 40.2 |
| Patients effectively placed in palliative care (clinical evaluation and application of PPS scale) | 74 (34) | 27.7 – 40.2 |
| Opinions not provided due to death. | 28 (12.9) | 8.4 – 17.3 |
| Opinion requested, but PCST score <4 and denied by Palliative Commission following application of PPS | 1 (0.4) | –– |
| Total | 218 (100) | |

Confidence interval of 95%.

Source: Records of the intensive care units of the Espírito Santo State Hospital, Brazil, in 2017.

When analyzing the religion of the older adults evaluated in this study who were effectively placed in palliative care, there was a predominance of Catholics (32.4%), followed by evangelicals (11.9%), atheists (2.7%), and records where religion was not informed (50%).

## DISCUSSION

Ministry of Health Resolution No. 41/2018 was a milestone for the practice of palliative care in Brazil as it regulated this practice as a health policy. The resolution establishes that any person affected by a life-threatening disease, whether acute or chronic, will be offered palliative care following the diagnosis of their condition[15].

However, early and correct diagnosis has been a major challenge in healthcare institutions, due to a number of institutional barriers, such as a lack of sufficient beds for palliative patients, an inadequate number of palliative care committees, non-uniformity of training for health professionals on palliative care and few palliative care programs in health institutions[16].

The situational analysis and indications for structuring palliative care programs in Brazil by the National Academy of Palliative Care (or ANCP) in 2018 found 177 palliative care services in the country, of which 50% were concentrated in the southeastern region, and with only 13 teams in the north-northeast region[3], demonstrating the great inequality in the availability of palliative care in the Brazilian health system.

In Brazil, older adults represent 52% of ICU admissions in public services, and spend 60% of the daily and financial resources available for this sector[17]. A higher value was found in the present study, which corroborates the importance of this population in terms of the occupation of ICU beds, and the need to evaluate whether every patient truly benefits from using all the technological and structural arsenal of equipment available in these environments, or if they have serious chronic diseases that from a palliative perspective could have improved quality of life and be treated mostly outside the intensive care unit environment.

According to data from the global atlas of worldwide palliative care, it is estimated that over 20 million people each year require end-of-life palliative care[7]. Most (69%) are older patients, and there is a slight predominance of males (52%)[6], whereas in the data found in the present study there was a predominance of females.

The comorbidity that led to the largest number of hospitalizations of older adults in the ICUs studied was cardiovascular diseases (26.8%), followed by neoplasms (20.2%). These data are similar to those found by the World Health Organization in the 2014 global atlas of palliative care[6].

According to Table 5, of the 218 records of patients with a PCST score greater than or equal to 4, only 102 requests for opinions were made. This implies that 47% of opinions on patients that could benefit from palliative care were effectively requested. Thus, it can be deduced that 115 patients who were recommended for evaluation by the palliative team were not given this opportunity. This fact also highlights the high degree of sensitivity of the scale and reinforces the possibility of using it as a palliative care evaluation[10], although it cannot be ruled out that the high sensitivity observed may overestimate the number of patients referred for palliative care.

Still in relation to Table 4, the Kappa agreement coefficient among patients for whom the PCST and PPS were applied (75 records) was calculated. The value found between the scales was 1.00, considered perfect agreement[14], reinforcing the potential of its use as an assessment tool for identifying the need for palliative care, as the PPS allows prognosis and patient functionality to be evaluated and the PCST evaluates four criteria: underlying disease, associated diseases, the patient's functional condition and the patient's personal condition, thus analyzing individuals more broadly, with a greater possibility of identifying patients who will benefit from palliative care[9-12].

These results also demonstrate a probable failure to identify possible palliative patients, leading to the occupation of important ICU beds that could be vacated if the palliative team identified the possibility of treating patients in wards or at home. Another important issue to be considered is the increase in costs from unnecessary procedures and technologies leading to the increased physical and psychological suffering of patients and their families through therapy that increases the length of hospitalization without changing the outcome of the condition[18].

While not the objective of the present study, based on the idea that the comprehensiveness of care that should also value subjective aspects, it was found that the aspects related to the religiosity and spirituality of patients were not considered. The perception of physicians on religiosity/spirituality, as well as staff training in multidisciplinary spiritual care, can contribute to the quality of end-of-life care in older adults[19].

In addition, spirituality is an important factor for patients with severe illness and who are indicated for palliative care, as it represents a source of comfort, strength, faith, as well as of coping and a guide to conducting one's life[20].

Brazil is a country with a predominance of the Christian religion and the largest number of Catholics in the world, data that coincide with the study in question. According to data from the 2010 IBGE census, 64.6% of the Brazilian population practices the Catholic religion, followed by 22.2% evangelicals, 8% atheists and 2% who are followers of spiritualism[21]. It is noteworthy that in 50% of the medical records there were no records on the religion of the patients. This data demonstrates the need to pay attention to and register such information, due to the value of spiritual aspects for the health of individuals.

The present study contributes to the expansion of scientific knowledge among health professionals, as well as to the improvement of the management of both ICU beds and the palliative care service. One of the limitations of the study was the low number of medical records for a comparative study between the scales by statistical methods. Thus, further studies with larger samples should be performed to confirm or otherwise the results identified in this study.

## CONCLUSION

The study identified perfect agreement between the PCST and PPS scales, and found that the PCST, due to its high sensitivity, is an important tool in indicating patients for palliative care. It is notable that 143 individuals with a proven indication for palliative care were not even evaluated by the palliative commission, indicating the need for a more efficient service in the hospital under study. Cancer, stroke sequelae, renal failure, dementia, chronic obstructive pulmonary disease, cirrhosis, and congestive heart failure were the most frequent causes of the need for palliative care. Despite the recognized role of spirituality in palliative care, in half of the cases there was no record of the religion of the patient.

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# The social identity of older adults from the perspective of children

Iara Sescon Nogueira[1]  ID
Pamela dos Reis[1]  ID
Sonia Silva Marcon[1]  ID
Ieda Harumi Higarashi[1]  ID
Vanessa Denardi Antoniassi Baldissera[1]  ID

## Abstract

*Objective:* To reveal children's perceptions about the social identity of older adults. *Methods:* A qualitative and exploratory-descriptive study was carried out with 17 children enrolled in the 4th year of elementary education of a private educational institution located in southern Brazil. For data collection, a semi-structured individual interview was used, together with graphic elucidation and storytelling, the audio of which was recorded, transcribed in full and analyzed by lexical analysis using the IRaMuTeQ® software, based on the Descending Hierarchical Classification. The Social Identity proposed by Berger and Luckmann was used as an analytical reference. *Results:* Six classes emerged, revealing that the children attribute dependency to the older adults, with aging reduced to a phase of weaknesses and limitations, but opportune for leisure. The health conditions of the older adults were related to the natural wear of aging and the results of previous choices, from healthy habits perpetuated throughout life. *Conclusion:* The social identity of the older adults from the perception of children is linked to senescence and senility that alter daily life in an adaptable but natural manner.

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Correspondence
Iara Sescon Nogueira
iara_nogueira@hotmail.com

## INTRODUCTION

The concept of aging is historically constructed from the beliefs, attitudes and cultural values of a given society, meaning that the way the phase is experienced is influenced by culture, which in turn influences how aging is seen[1,2]. Yet aging is still related to the negative aspects of the process, and is associated with changes related to senility[1,2].

This socially constructed reality leads to the negative management of aging, which disregards the possibility of growing old in an active and healthy manner or allowing older people to realize their potential for physical, social and mental well-being[3]. Old age should be considered as a phase of human development and a broad, natural process of life that is dependent on the social conditions and political, economic and health possibilities that permeate the history of each individual[4].

In terms of children and their relationship with aging, it is known that the way families understand and care for their older relatives reflects on the behavior and perception that children have towards people at this stage of life[5]. Nevertheless, a family's daily treatment of its older adults is also permeated by the constructions of their own family members, imbricated with social determination. In saying this, it appears that the behaviors, habits, norms and routines of a family are the result of its own experience influenced by aspects of social understanding[6].

In this context, reality is not considered something palpable and immutable, but rather, the result of a social construction, formed by objectifications and meanings[6], and therefore, the social identity of the older adult from the perspective of children is a phenomenon that derives from the dialectic between subject and society[6].

As aging is known to be a natural and inevitable process throughout life, as well as a polysemic object, precisely because of the impossibility of treating it as a homogeneous phenomenon[7], it is important to reveal perceptions about the social identity of the older person, as the different conceptions attributed by society, including the children who make up the youngest group of the social composition, influence the health of older adults, and, in the future, of themselves[8].

It is therefore necessary to investigate the perception of children of the social identity of older adults, as these are surely the most recent sources of the social concepts currently crystallizing. However, despite the speed and magnitude of population aging in Brazil and the social changes resulting from it, studies addressing the perspective of children on this phenomenon were not found in Brazilian literature. The objective, therefore, was to reveal the perceptions of children of the social identity of older adults.

## METHODS

An exploratory-descriptive qualitative study was carried out with children enrolled in a private educational institution located in the northwest of the state of Paraná, in the southern region of Brazil..

The sample was selected for convenience, and was defined based on an inclusion criterion: being enrolled in the 4th year of early childhood education, as children at this level of education have greater capacity for interaction and verbal communication. The only exclusion criterion adopted was the absence of written authorization from parents/guardians (six cases). Two children refused to participate in the study, despite having authorization. Thus, the number of participants was defined based on fatigue, and it was not necessary to include students from other years of early childhood education, as the data collected had explanatory density about the subject under study.

Data were collected during three visits to the school in September 2018, through a semi-structured individual interview combined with graphic clarification and storytelling[9,10]. A script developed by the researchers was used, consisting of guiding questions about the social identity of older adults, in addition to sociodemographic issues (age, sex and whether lives with older adults).

With the purpose of enriching the investigation, using the thematic drawing type graphic elucidation

technique[10], the participants were asked, prior to the interview, to draw on a blank sheet what an older adult represents for them, according to their perception of the following themes: physical characteristics, health conditions, housing and activities performed. During the interview, the thematic drawing was referenced, and the children were asked about it, allowing them to reflect knowledge and reality from the image produced, bringing out thoughts and emotions[10,11].

For storytelling[9,12], the participants were asked to imagine themselves as older adults, using their knowledge, perceptions, worldview and affinity about what it's like to be an older person, thus telling a story of "make believe" . At this stage they were asked: *How old are you? What do you do with your life? Where do you live? Are you working? What is your health like?*

The interviews were audio-recorded, conducted by two researchers and carried out during class time, in a room adjacent to that of the study, on days and times previously defined by the academic coordinators and the class teacher, so as not to affect teaching activities, and lasted for an average of 10.5 minutes.

For data treatment and analysis, the interviews were transcribed in full and organized in a textual corpus that was submitted to lexicographic analysis using the IRaMuTeQ® (R Interface for multidimensional analysis of texts and questionnaires) software, based on the Descending Hierarchical Classification (DHC)[13].

DHC divided the Elementary Context Units (ECU) into classes based on the most frequently used vocabulary and the highest chi-square values in each class. The lexicographic analysis of the classes was presented by means of a DHC Word Cloud dendrogram, which organized the words based on the indication of frequency[13], and by means of a table, prepared by the researchers and organized by classes in decreasing order of ECUs as breakdowns and sub-breakdowns of the dendrogram.

Such classes were interpreted based on the children's perceptions of the social identity of older adults. Each was designated with a nomenclature and, to compose the classes, words with $p<0.0001$, indicating a significant association, were selected[13].

The data were analyzed based on the Social Identity framework proposed by Berger and Luckmann, which states that the construction of identity is a dialectical process and presupposes that the individual understands society as an objective and subjective reality[6].

This study respected all the ethical and legal precepts established by the National Health Council[14]. The guardians of the children signed two copies of an Informed Consent Form. To ensure the anonymity of the participants, they were coded with the acronym C, referring to "Child", followed by Arabic numbers that corresponded to the order in which the interviews were conducted.

The research underwent ethical review by the Human Research Ethics Committee of the Universidade Estadual de Maringá, decision nº 2.794.707/2018.

## RESULTS

Seventeen children participated in the study, all of whom were aged between nine and ten years, and ten of whom were male. Only three children reported not living with older adults, and 14 said they lived mainly with grandparents (n=14), followed by great-grandparents (n=3) and/or neighbors (n=1).

The analysis of the *corpus* from the interviews identified 6,764 occurrences of words, distributed in 469 active forms and divided into 166 ECUs, representing 86.46% of the *corpus*.

Six classes of analysis originated from the DHC, presented in a Word Cloud dendrogram (Figure 1) and chart format (Chart 1). The DHC divided the ECUs into two divisions: from the first, classes 4 and 5 were obtained (ECU = 38.6%), and from the second, the other four classes were obtained, divided into two sub-divisions. One sub-division resulted in classes 1 and 6 (ECU = 32.5%), and the other classes 3 and 2 (ECU = 28.9%).
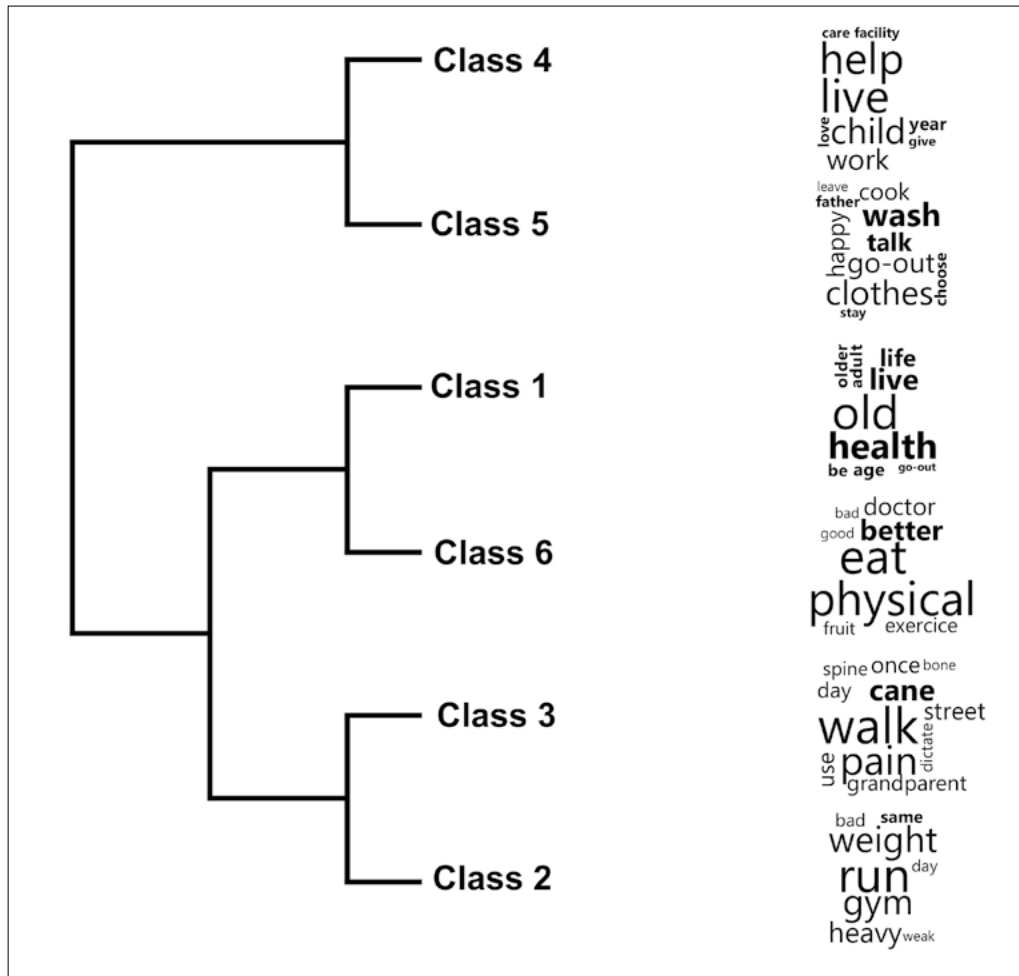
**Figure 1.** Word Cloud Dendrogram: children's perceptions of the social identity of older adults, in municipal region in the northwest of the state of Paraná, Brazil, 2018.

Source: Authors (2018). Organized by IRaMuTeQ® software.

**Chart 1.** Lexicographic analysis of classes regarding children's perception of the social identity of older adults, listed according to the DHC dendogram of the textual *corpus*. Municipal region from the northeast of the state of Paraná, Brazil, 2018.

| Classes | Nomenclature | Lexicographic analysis | | | |
|---|---|---|---|---|---|
| | | Words (*p*<0.0001)* | Total eff.** | X²*** | %**** |
| Class 4 21.7% 36 ECU | Older adults attributed a perception of dependence | Live | 28 | 42.28 | 67.86 |
| | | Help | 12 | 37.3 | 91.67 |
| | | Son/Daughter | 15 | 33.02 | 80.0 |
| | | Family | 14 | 29.13 | 78.57 |
| | | Grandchild | 13 | 18.77 | 69.23 |
| | | Take care of | 31 | 16.0 | 48.39 |

to be continued

Continuation of Chart 1

| Classes | Nomenclature | Lexicographic analysis | | | |
|---|---|---|---|---|---|
| | | Words (*p*<0.0001)* | Total eff.** | X²*** | %**** |
| Class 5 16.9% 28 ECU | Aging is perceived as an opportunity for leisure that includes performing instrumental activities of daily living | Leave the house | 12 | 31.17 | 75.0 |
| | | Talk | 6 | 30.68 | 100.0 |
| | | Clothes | 7 | 24.7 | 85.71 |
| | | Wash | 10 | 21.42 | 10.0 |
| | | Place | 8 | 20.26 | 75.0 |
| | | Go out | 6 | 19.61 | 83.33 |
| | | Play | 11 | 18.38 | 63.64 |
| | | Home | 46 | 18.31 | 36.96 |
| Class 1 21.1% 35 ECU | The condition of the life and health of older adults is perceived by the natural wear and tear of aging and also the results of previous choices | Old | 11 | 34.52 | 90.91 |
| | | Health | 59 | 24.93 | 42.37 |
| | | Live | 15 | 20.59 | 66.67 |
| | | Good | 16 | 18.25 | 62.5 |
| | | Good | 40 | 18.12 | 45.0 |
| | | Depend | 19 | 17.47 | 57.89 |
| | | Life | 12 | 16.15 | 66.67 |
| Class 6 11.4% 19 ECU | Health and quality of life in aging are perceived as a result of healthy habits perpetuated throughout life | Eat | 20 | 52.89 | 60.0 |
| | | Physical | 8 | 47.97 | 87.5 |
| | | Junk | 5 | 39.89 | 100.0 |
| | | Better | 4 | 31.71 | 100.0 |
| | | Activity | 12 | 28.06 | 58.33 |
| | | Doctor | 8 | 21.61 | 62.5 |
| | | Health | 59 | 17.64 | 25.42 |
| Class 3 16.9% 28 ECU | Older adults are perceived though senescence and senility that change daily life in an adaptable but natural way | Walk | 16 | 42.67 | 75.0 |
| | | Pain | 11 | 35.44 | 81.82 |
| | | Walking stick | 11 | 26.21 | 72.73 |
| | | Watch | 7 | 24.7 | 85.71 |
| | | Case | 4 | 20.2 | 100.0 |
| | | Bike | 4 | 20.2 | 100.0 |
| | | Television | 9 | 16.83 | 66.67 |
| | | Street | 7 | 15.52 | 71.43 |
| | | Hair | 3 | 15.06 | 100.0 |
| Class 2 12.0% 20 ECU | Aging is perceived as a phase of weaknesses and limitations | Run | 16 | 45.86 | 61.11 |
| | | Weight | 6 | 29.85 | 83.33 |
| | | Academy | 5 | 22.46 | 80.0 |
| | | Jump | 3 | 22.3 | 100.0 |
| | | Heavy | 6 | 17.52 | 66.67 |
| | | Play | 6 | 17.52 | 66.67 |
| | | Strength | 4 | 15.33 | 75.0 |
| | | Soccer | 4 | 15.33 | 75.0 |

*Significance level of the association of the word with the class of *p*<0.0001; **Number of text segments in the corpus that contain a certain word; ***X² of association of the word with class; ****Percentage of occurrence of the word in the text segments of the class.

**Source:** Authors (2018). Organized by IRaMuTeQ® software.

Class 4 (ECU=21.7%) revealed that children attribute a state of dependency to older adults, requiring them to receive help and care, and therefore, the importance of living with or near their families. When this is not possible, they mention the possibility of a domestic help/caregiver providing care, or a care facility as a housing option, as noted in the following ECUs:

"I'm living with my children, but if they don't have much time, I live in the care facility. There will be people in the facility who will take care of me" (C2).

"I will be living in my own home with a person who helps me. I will have domestic help or someone from the family to help me" (C3).

"I hope that I am living with my husband, children and grandchildren. They will be living in a different house, but in the same neighborhood, living close by, to spend more time with the family. To help you need to live nearby" (C7).

Class 5 (ECU=16.9%) mentions the pleasurable moments of leisure experienced by older adults, with aging being perceived as an opportunity for leisure that includes the performance of Instrumental Activities of Daily Living. As leisure options for older adults the children described spending time with friends and family, talking, walking, going out, playing with grandchildren and also carrying out household chores, such as washing clothes and cooking, seen by them as pleasurable activities:

"She meets her friends and sits at her house and talks. They meet on the way then go out somewhere" (C1).

"I'm preparing food and doing laundry. I will enjoy doing this when I am old" (C9).

"When I'm old, I'm going out to the park, the mall, to a friend's house" (C12).

"You need to go out more, play more with your grandchildren or children" (C17).

Class 1 (ECU=21.1%) shows the children's perceptions of the health conditions of older adults,

related to the natural wear and tear of aging and also the result of past choices. According to the children, the health of older adults depends on the choices they make throughout life. They also believe that there are changes inherent to the natural aging process, highlighting that health is also influenced by age. Regarding the health of older adults, the children stated:

"The health of older adults will depend on the choices they make" (C1).

"It depends. If older adults take care of themselves, eat good things, do not smoke, their health is good. If not, it's bad. It will depend on how they took care of themselves" (C12).

"It depends on age [...] When you are older you may even lose some capabilities, but if you take care of yourself very well, I think you won't lose them" (C13).

"There are adults who are really old because they ate well and lived healthily throughout their lives" (C16).

Class 6 (ECU=11.4%) clarifies the life choices mentioned above and which influence the health and quality of life of the older adults, perceived as the result of healthy habits perpetuated throughout life. According to the children, these choices are related to health promotion, especially with healthy lifestyle habits, such as healthy eating and the practice of physical activity, but also with disease prevention and the carrying out of medical and health monitoring, as the following reports show:

"Health is good. You can run and do physical activities, you have to be healthy. Every older adult can be healthy, if they go to the doctor, eat good, healthy things"(C4).

"My health will be good, as I will eat a lot of fruit and I will do a lot of physical activities" (C6).

"It depends on when you're younger, if I keep eating a lot of junk, my health will not be so good" (C7).

"I drew him playing football. His health is great, because he exercises a lot and eats fruit" (C9).

"Some older adults are very healthy. It depends on the food. If you eat a lot of junk, like snacks, things that have fat, you won't live long. There are a lot of older adults who eat a lot of fruit, then live longer, live healthier" (C16).

Class 3 (ECU=16.9%) demonstrates the children's stereotypical view of older adults, perceiving them in terms of senescence and senility that alter daily life in an adaptable but natural way. For them, older adults are those who have lived many years of life and have peculiar physical characteristics, such as the presence of grey hair, wrinkled skin, pain in the spine and the use of a cane and/or walker. According to the children, these characteristics make older adults unable to perform certain activities and lead them towards others, as can be seen in the following ECUs:

"Her health is fine, she has a little pain in her spine, and is limping with a cane. She is old and losing her strength. I think it's normal for her to be like this" (C2).

"[...] They have grey hair, most of them have grey hair and wrinkled skin. She uses a cane, and has back pain. Every older adult must have back pain" (C2).

"She has a cane and the one with four legs, the walker. She watches television" (C3).

"If he is weaker he cannot move much, to avoid breaking his bones. He can't ride a bike" (C11).

Finally, Class 2 (ECU=12.0%) corroborates the previous class by exemplifying the activities that, according to the children, older adults cannot perform due to their physical characteristics and health conditions. Children attribute to older adults weaknesses and limitations that prevent them from carrying out activities that require greater vitality and muscle strength, especially running, jumping, playing football, carrying heavy objects and attending gym/weight training, shown in the following ECUs:

"When I'm old, I won't be able to run and play football" (C2).

"You can't go to the gym because of a spinal problem. You also can't walk alone at night, go to the gym a lot or lift heavy weights" (C7).

"Older adults can't go to the gym. Because the gym it is the same thing as doing heavy work" (C5).

"Older adults cannot run and jump. Going to the gym is very dangerous, an accident can happen" (C8).

## DISCUSSION

Most of the children in the present study lived with older adults, which influenced their perceptions about the social identity of such adults. Considering that an individual's own experience is the reality of their conscience[6], children's perceptions are directly related to what they experience and observe in their social circles.

In this regard, as shown in Class 4, the children attributed the characteristic of dependence to the older adults, describing them as needing to live close to or with their families, recognizing the family as a means of support and considering such support as one of the most important factors for coping with losses due to old age[15]. It is noteworthy that frailty, exposed in Classes 4 and 2, often caused by pathological aging, implies greater needs and requires greater attention and care[16].

The storytelling technique proposed that children change from looking at others to viewing themselves, allowing a reflection on being in the shoes of older adults, who tomorrow they themselves will be. When thinking of themselves as older, many children reported needing help and care, even though they considered living in their own homes as the best option, although they also mentioned the long-term care facilities as a housing option.

The social identity of the older adult can diversify according to the group that shares it and, over time and the development of the individual, its elements can be transformed during a life cycle[15]. As the result of the subjective reality that is in constant dialogue with society, the social identity of the older adult can be maintained, modified or remodeled by social relationships[6].

Thus, the social identity of the older adult from the perception of the children was directly related to

the social role played by such adults within society, which is defined by patterns of behavior that reflect and characterize the position of older adults within the social group to which they belong[17].

The leisure moments observed in Class 5 represent a determinant for the promotion of a healthy life and encourage self-esteem, social integration and autonomy, which are essential for active aging and physical, psychological and sensory well-being[18]. For the children, aging was seen as opportune for leisure activities, which are necessary and related to those practiced by the older adults living within their social network, that is, they understand the activities performed by their peers and perceive leisure as a meaningful and social reality[6].

Leisure is culturally influenced and varies according to the customs and preferences of the local population, implying a process of socialization[6]. It also varies according to age groups, interests and motivations[19], which was observed when the children expected that with advancing age, their tastes would undergo changes, for example, when they considered that as an older adult, the practice of housework would be an option for leisure, externalizing their own being in the social world[6].

Leisure in old age is a product of social interaction that develops through the process of acquiring roles in society, and is characterized as a learning phenomenon[6,15]. With aging, older adults go through a process of the loss of roles in different social environments, and thus, the replacement of roles and activities by others that are considered significant, including those involving household chores and other Instrumental Activities of Daily Living as leisure options, increasing feelings of social utility and well-being[19].

The social identity of older adults with regard to leisure is linked to a social construction that suggests that when experiencing old age, a person needs to enjoy their time more fully, with freedom of choice and interaction with their social networks[20], consistent with the assumptions of Berger and Luckmann[6] with regard to the reality of everyday life.

Such a reality of daily life is objectified by the children, that is, it is already imposed by society

before it acquires meaning for them, maintaining the intersubjectivity that differentiates leisure for older adults as a reality of everyday life, separate from other realities and individuals, which exist through the interrelationship and dialogue with the other[6].

It is important to mention intergenerational interaction between grandparents/great-grandparents and grandchildren, which is important for both generations in promoting moments of dialogue, reducing isolation and valuing the self-esteem of older adults, in addition to encouraging the consolidation of the social bonds that they provide for individuals in this relationship, enriching their knowledge and acquiring life experiences, generating more positive attitudes towards old age[21]. It is through dialogue that correspondence with the meanings that children have about the world occurs, fostering the construction of the social identity of older adults and representing a mutual influence, in which society is a human product, just as the individual is a social product[6].

For the children, according to Class 1, the conditions of life and health of older adults depends on their past choices in life and is perceived by the natural wear and tear of aging. This perspective of personal responsibility was also addressed in another study, the results of which show old age as the result of a life story, personal choices and how one has lived over the years. A healthy lifestyle, with good nutrition, physical exercise, proximity to nature and family, allows older adults to be happy, healthy and active[16], as was seen in the present study (Class 6).

A meritocratic view of aging is notable in different contexts of society. Every individual is aware of temporality and its physiological reflexes, even if they do not recognize them in themselves[6]. Temporality is coercive and awareness of the finitude of life generates anxiety and affects the attitude of individuals towards life projects[16].

Among the physical characteristics attributed to older adults by the children, some were limiting and/or negative, notably the senescence and senility that alter the daily lives of older adults. Naturally, one cannot ignore the biological changes imposed on the human body by the passing of time. Even if chronic diseases do not appear, aging always involves some type of functional loss[22]. However, the aging process

has meanings that go beyond the chronological and biological dimension, being a multidimensional, heterogeneous and individual experience[23].

Pain, a word that occurred significantly in the relevant class of analysis (Class 3), was related by children to the sick and aged body. Erroneously, senility was perceived by children as a natural process, that is, they did not differ between the concepts of senescence and senility, associating aging with the presence of disabilities and diseases.

Through the social transmission of stereotypes, roles in society and their respective rules of conduct are defined. Deviations from these norms, considered universal truths about reality, are often considered as moral depravity, mental illness or incivility[6]. This brings us to the activities which according to the children are permitted for older adults, and which are always more limited, not only by the natural phenomenon of aging, but also by the typification of roles.

The stereotypes recognized by children about older adults (Class 3), appear as a result of living with them, added to the subjective knowledge – typification – about aging that they are presented with. These typifications constantly affect interactions with the other and also shape them, just as the relationships are flexible and the stereotypes continuously modified due to the exchange of subjective meanings[6]. The possibility of changes in the social constructions of old age is therefore provided.

The negative stereotypes of aging influence the perception of the identity of older adults in relation to social support, especially family care and attention, resulting in the expectation of greater social support. Political initiatives to combat age-related prejudice and promote positive aging from childhood are important[24].

A major challenge in changing the negative view of aging is to find strategies that promote positive feelings and views of aging among different generations. However, promoting positive intergenerational relationships, educating the population about aging, as well as changing the representation of older adults in the media by reinforcing their positive aspects, can be successful

strategies and, consequently, can change the views of aging in future generations, given that stereotypes are learnt in childhood[25].

Finally, Class 2 demonstrated that the social identity of the older adult remains linked to the concept of frailty, as was also observed in Class 4, maintaining the negative and erroneous social construction of old age[2,26]. According to children, aging is a phenomenon that can cause the physical damage that prevents the performance of activities that require greater vitality. This previously defined construction of the social image of older adults is internalized by the children, who identify it as a reality assigned to such individuals[6], and therefore, when they imagine older adults, they do not consider the possibility of them, for example, running, playing ball or doing weight training.

The social world is constructed by dialogue, through socialization that begins in childhood. The apprehension of meanings is not the result of the autonomous conceptions of the individual, as it occurs when they assume those that exist in the world in which others already live. Only after this appropriation can the meanings be modified or even recreated as a result of the dialectic between what was assigned and appropriated[6].

Given this fact, the understanding of the social identity that the older adult has depends on the individual's interaction with their social environment, and for this reason, it is in a constant process of change[6,26], meaning that stereotypes have to be rethought, starting from the recognition of the other, of what is different, of social changes, in a process of understanding and deciphering. Therefore, it is in the dialectic between nature - physical limitations - and the socially constructed world – the stereotype of aging - that the human organism is transformed, since in this same dialectic humans produce reality and, with that, produce themselves[6].

As limitations of the present study, in considering life experiences as determinants of the social construction of reality – the reference of the study – it should be noted that the selection of participants was carried out without considering the coexistence or otherwise of the children with older adults. Thus, the projections they made about being an older adult

is a construction that may have been limited by the absence of objective elements of reality or have been influenced by aging experiences particular to their social universe. Therefore, the context in which the children are inserted and their cognitive conditions for interpreting the world around them certainly influenced their perceptions about the social identity of older adults, so that the results presented are limited to the reality in question. A target audience extended to other contexts could obtain different results.

## CONCLUSION

The present study revealed the perceptions of children about the social identity of older adults, finding that they attribute a state of dependence to such adults, with aging reduced to a phase of weaknesses and limitations, but opportune for leisure. It was found that the living and health conditions of older adults were related to the natural wear and tear of aging and also the results of previous choices, based on healthy habits perpetuated throughout life. Finally, the social identity of older adults is linked to senescence and senility, which alter daily life in an adaptable but natural way, related to physical and above all social aspects.

It is essential to strengthen the education of children in the context of issues related to aging, based on actions within the scope of their educational system and also in relation to health, in order to broaden concepts about the identity of older adults, including recognizing them as individuals capable of active and healthy aging.

New studies with different methodological approaches are suggested, as the social identity of older adults and its meaning still require deeper scientific investigation.

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# Analysis of a training program for older workers in the use of technology: difficulties and satisfaction

Taiuani Marquine Raymundo[1]  (ID)
Carla da Silva Santana Castro[2]  (ID)

## Abstract

*Objective:* To analyze the potential of individualized training in the use of technology in the work environment as well as the satisfaction of workers with such training. *Method:* A quantitative, descriptive, interventional and longitudinal study was performed. Workers aged 50 and over, who performed any type of work activity and who had difficulties using technology participated. The following instruments were used for data collection: a socioeconomic questionnaire, a questionnaire about the technology used in the work environment and difficulties with its use and a scale to evaluate user satisfaction with training. The training sessions used the Client-Centered Practice approach. The data were analyzed by means of descriptive statistics and compared using the McNemar test. *Results:* A total of 30 workers participated in the study (15 men and 15 women), who were aged between 50 and 75 years and had a mean age of 63.3 years ($\pm$7.89). The participants had the most difficulty using computers, cell phones, the internet, email and recording and playback devices. After the training, participants exhibited significantly less difficulty in using cell phones ($p$-value<0.01), computers ($p$-value<0.01), copiers ($p$-value=0.03), the internet ($p$-value=0.04), e-mail ($p$-value=0.02) and recording and playback devices ($p$-value=0.04). They were satisfied with the training program, the instructor and with their own performance. *Conclusion:* The results of the present study indicate the potential of individualized training focused on the needs and interests of older workers so that they can perform work activities involving technology with autonomy and independence.

[1] Universidade Federal do Paraná (UFPR), Departamento de Terapia Ocupacional. Curitiba, PR, Brasil.

[2] Universidade de São Paulo (USP), Faculdade de Medicina de Ribeirão Preto (FMRP), Departamento de Ciências da Saúde, Programa de Pós-Graduação Interunidades em Bioengenharia EESC/FMRP/IQSC – USP. Ribeirão Preto, SP, Brasil.

Correspondence
Taiuani Marquine Raymundo
taiuani@ufpr.br

## INTRODUCTION

Over the past 50 years, the age structure of the Brazilian population has undergone profound changes, which has had a significant impact on the age distribution of the population, with a decrease in the youth segment and an increase in the adult and older adult groups. As a consequence of such population aging there is also aging of the economically active population (EAP) and the working age population (WAP), the result of the declining entry of young people into the labor market, and the permanence of older workers in the same[1].

According to research by the Brazilian Institute of Geography and Statistics (or IBGE)[2], which described the main highlights of the evolution of the labor market in metropolitan regions, despite a strong concentration in the group of people aged from 25 to 49 years, it is only the participation of the 50 and over age group that has been increasing. This behavior follows population aging. From 2013 to 2015, the proportion of the WAP aged 50 years or older increased by 9.2%, in contrast to the other age groups, which suffered a decline[2].

There are a number of factors that influence a person's decision to continue working longer, including their own financial needs or the needs of family members (many older adults are family breadwinners); psychological needs; social interaction and participation; the desire to feel active; the meaning and importance of work in workers' lives; compliance with requirements and to save for retirement[3,4]. Another factor that can influence people's permanence in the labor market is the change in social security and retirement rules, which are constantly under discussion[5].

The social trends indicated suggest that, year after year, a greater number of older workers will become part of the labor market and, therefore, strategies will be needed to maximize the productivity, health, safety and well-being of these individuals. The lack of proper planning in the near future may result in a shortage of labor and skills[6].

The changes in the 21st century working environment have created new requirements for the knowledge, skill and capacities of workers. Technological innovations have led to continuous and rapid changes in such environments. Such changes bring with them concerns about the ability of older workers to adapt to this new reality, as, in most cases, the technology available today was not part of the environment of workers aged 50 years or over. In addition, technological changes in the form of the expansion of information technology optimize the speed and space (geographic) of information, resulting in direct impacts on the relational dimensions of individuals and work[6,7].

Therefore, workers will have to continually adapt to these changes resulting from globalization and advances in information technology. The reduction of differences in professional skills, especially in relation to rapid technological advances, can be achieved through the provision of training and lifelong learning programs[6,8]. Training programs can enable older workers to improve their skills and continue to perform their duties satisfactorily[9-11].

Training modalities and techniques are also recommended to improve the performance of young adults, as well as older people. The exception concerns the improvement of the development of practical activities in relation to the conceptual training of older adults[12]. Thus, it is essential to provide access to training and ensure that training programs are tailored to the needs and preferences of those who receive them so that there is "successful learning"[3].

In view of the above, the present study aimed to analyze the potential of individualized training for the use of technology in the workplace, as well as the satisfaction of workers with this training.

## METHOD

A study with a quantitative, descriptive, interventional and longitudinal approach was performed, consisting of three phases: pre-training, training and post-training. This study is part of a doctoral thesis entitled *Use of technological equipment and information and communication technology by workers aged 50 or over in their work activities: impact of training*. Data were collected between July 2015 and December 2016.

The study included individuals aged 50 years and over, who performed work activities, paid or unpaid, used Technological Devices (TD) and Information and Communications Technology (ICT) at work and who had difficulty using the same. Participants could be of either sex, of any marital status, any socioeconomic class, have a minimum education of four years of schooling, not suffer cognitive deficits according to the Mini-Mental State Examination (MMSE), not have neuromotor disabilities, but have visual impairments, provided they were corrected.

The sampling was based on intentional selection for convenience. For the sample to be homogeneous, six strata were created. The strata were balanced and composed of five participants each, giving a total, at the end of the study, of 30 participants (Stratum 1: men aged between 50 and 59 years; Stratum 2: women aged between 50 and 59 years; Stratum 3: men aged between 60 and 69 years; Stratum 4: women aged between 60 and 69 years; Stratum 5: men aged between 70 and 79 years; Stratum 6: women aged between 70 and 79 years). The study from which this manuscript originated relied on a mixed, qualitative-quantitative approach. Thus, the exhaustion/saturation of information strategy was applied, which explains the sample size. Only the quantitative data is provided in this manuscript.

The recruitment of participants was carried out through invitation and dissemination via electronic media, at the Universidade Federal do Paraná (UFPR) and, also, by recommendation. The training was carried out at UFPR, in the Occupational Therapy department. To meet the selection criteria, the participants were submitted to the MMSE[13] and the cut-off point proposed by Bertolucci et al.[14] was adopted.

To characterize the sample, the selected participants answered a socioeconomic questionnaire. In the pre-training phase, a questionnaire about the TD and ICT used in the work environment, the specific difficulties in using the same and the degree of difficulty (none, some and high) was applied. This was developed by the author of the present study based on the questionnaire on experience with computers and technology developed by the Center for Research and Education on Aging and

Technology Enhancement[15]. From a list, participants identified which TD and ICT they used at work, stated whether or not they had difficulty using the same, and what the degree of difficulty was. Participants could enter TD and ICT that were not included in the list.

The training was carried out at the Occupational Therapy Department of the Universidade Federal do Paraná and, when necessary, at the participants' own workplace. The approach used in the training was the Client Centered Practice (CCP), which recognizes the subject's autonomy, their need to choose what they need and want to learn themselves, and their recognition of what difficulties affect their work performance[16-19]. The training programs were designed individually, and the duration, frequency and number of sessions were defined according to the needs of each participant.

In addition, the structure, planning and development of the training were based on: prior knowledge about TD and/or ICT; aspects related to the aging process; adaptation of the environment to the needs of the participants; specific pedagogical practices based on the needs and learning pace of each participant; logical sequence of contents; practical exercises to revise and memorize content and generalize learning[20].

The instructional materials were constructed throughout each session, individually, with letters of appropriate size and font; spacing between sentences; step-by-step functions; real illustrations; and simple language and reduced technical terms.

In the post-training phase, participants answered the *Scale on user satisfaction with training*, developed based on three other instruments: the scale of reaction to instructional procedures (revalidated in Brazil by Zerbini and Abbad)[21]; the scale of reaction to tutor performance (developed and validated in Brazil by Zerbini and Abbad)[22]; and the scale of reaction to results (developed and validated in Brazil by Borges-Ferreira)[23].

The scale applied in this study was divided into three items: A) training assessment, consisting of nine questions (11 Likert scale; 0=poor and 10=excellent);

B) assessment of tutors/trainers, composed of 14 questions (11 Likert scale; 0=never and 10=always); C) contribution of training for the participant, consisting of three questions (11 Likert scale; 0=none and 10=many). The evaluations of the results of the three items that make up the scale was carried out separately. For the analysis of general satisfaction, the total of each item on the scale was added. The higher the grade, the greater the satisfaction with the training (average values between 0 and 4 indicate little satisfaction; between 4.1 and 7 moderate satisfaction and, between 7.1 and 10 a great deal of satisfaction)[24].

Also in this phase, for comparison, the participants completed the questionnaire about the TD and ICT used in the work environment again. Socioeconomic data, data related to the TD and ICT used by the research participants, their degree of difficulty and satisfaction with training were analyzed using the descriptive statistics method.

To verify the potential of the training, that is, changes or otherwise in the degree of difficulty presented by the participants before and after training, the McNemar test was proposed. The analyzes were performed using the SAS 9.2 software and a significance level of 5% was adopted. All instruments, as well as the training, were carried out by the first author of this manuscript, during her doctoral research.

This study complied with Resolution nº 466/2012 and Resolution nº 510/2016 and was approved by the Research Ethics Committee of the Clinical Hospital of the Ribeirão Preto Medical School of the Universidade de São Paulo (HCFMRP/USP), under opinion nº 2.383.200. The research participants signed an Informed Consent Form (ICF).

## RESULTS

A total of 30 workers, 15 men and 15 women, aged between 50 and 75, with a mean age of 63.3 (±7.89) participated in the study (Table 1).

Participants also reported their various past and current occupations (university professor; occupational therapist; journalist; business administrator; agronomist; typist; library assistant; financial director; foreign language professor; among others). Of these, eight (26.7%) reported having the same occupation up to the date of the study, 11 (36.7%) had changed their occupation, but still performed activities in the same area of knowledge as the previous job, and eight (26.7%), reported changes both in current work activities and in the area of knowledge, when compared to their previous occupations. Finally, three (10.0%) of the participants performed the same role, but were hired as "senior employees" due to being retired. In relation to current occupation, 16 (53.3%) worked full time and four (13.3%) worked part time, five (16.7%) were self-employed, three (10.0%) were volunteers and two (6.7%) worked according to demand.

The TD and ICT most used by participants in the work environment were computers; cell phones; photocopiers; the internet; email; printer; and recording and playback devices (CD, DVD and pen drive). The greatest difficulties were reported in the use of computers, cell phones, the internet, e-mail and recording and reproduction devices (Table 2).

**Table 1.** Characterization of sample (N=30). Curitiba, Paraná, 2017.

| Socioeconomic Characteristics | Men | Woman |
|---|---|---|
| | n (%) | n (%) |
| Marital status | | |
| Single | 0 (0.0) | 2 (6.7) |
| Married | 13 (43.3) | 4 (13.3) |
| Divorced | 2 (6.7) | 6 (20.0) |
| Widowed | 0 (0.0) | 3 (10.0) |
| Years of schooling | | |
| 4 to 8 | 0 (0.0) | 1 (3.3) |
| 9 to 11 | 2 (6.7) | 5 (16.7) |
| 12 to 15 | 4 (13.3) | 2 (6.7) |
| More than 15 | 9 (30.0) | 7 (23.3) |
| Income (R$) | | |
| From 1,301 to 2,600 | 1 (3.3) | 0 (0.0) |
| From 2,601 to 3,900 | 1 (3.3) | 2 (6.7) |
| From 3,901 to 5,200 | 1 (3.3) | 4 (13.3) |
| Above 5,201 | 12 (40.0) | 9 (30.0) |

**Table 2.** Technological Devices (TD) and Information and Communication Technology (ICT) used in the work environment and associated degree of difficulty. (N=30). Curitiba, Paraná, 2017.

| TD and ICT | Degree of difficulty* | | | |
|---|---|---|---|---|
| | Participants that used them at work (%) | No Difficulty n (%) | Some Difficulty n (%) | A Lot of Difficulty n (%) |
| Cell phone | 22 (73.3) | 4 (18.2) | 12 (54.5) | 6 (27.3) |
| Fax | 5 (16.7) | 2 (40.0) | 3 (60.0) | 0 (0.0) |
| Computer | 30 (100.0) | 1 (3.3) | 22 (73.3) | 7 (23.3) |
| Photocopier / Scanner | 25 (83.3) | 9 (36.0) | 13 (52.0) | 3 (12.0) |
| Internet | 29 (96.7) | 7 (24.1) | 20 (69.0) | 2 (6.9) |
| Email | 29 (96.7) | 9 (31.0) | 18 (62.1) | 2 (6.9) |
| Printer | 27 (90.0) | 16 (59.3) | 10 (37.0) | 1 (3.7) |
| Card machine | 5 (16.7) | 5 (100.0) | 0 (0.0) | 0 (0.0) |
| Cash machine | 10 (33.3) | 8 (80.0) | 2 (20.0) | 0 (0.0) |
| Barcode reader | 5 (16.7) | 4 (80.0) | 1 (20.0) | 0 (0.0) |
| Telephone exchange | 10 (33.3) | 6 (60.0) | 4 (40.0) | 0 (0.0) |
| Tablet | 6 (20.0) | 3 (50.0) | 1 (16.7) | 2 (39.3) |
| Recording and playback devices | 24 (80.0) | 6 (25.0) | 16 (66.7) | 2 (8.3) |
| Multimedia projector | 8 (26.7) | 2 (25.0) | 5 (62.5) | 1 (12.5) |
| GPS | 1 (3.3) | 0 (0.0) | 0 (0.0) | 1 (100.0) |
| Bluetooth | 1 (3.3) | 0 (0.0) | 0 (0.0) | 1 (100.0) |

*The percentage was calculated considering the total number of participants who reported using each TD or ICT as 100%; GPS=Global Positioning System.

Due to the variation in the difficulties presented by the participants and considering the methodology adopted in the training, the number and duration of the sessions were different for each participant. Practical classes, ranging from 45 to 120 minutes, were held between once and twice a week, and the number of sessions ranged from one to 19. This variation was often related to greater difficulty in retaining information; differences in the pace of learning; little time available for training; and the need to review the content at the beginning of each new session, which eventually increased the duration of these.

According to the responses of the participants after the training, the most used TD and ICT in the workplace were the same as previously reported, and the TD and ICT that the participants reported the greatest degree of difficulty with were cell phones (n=16; 55.0%), computers (n=17; 56.6%) and tablets (n=18; 60.0%). In the comparison between the pre-training and post-training phases, a significant effect of the training performed was observed.

A significant reduction in the degree of difficulty was observed in the use of the following TD and ICT: cell phones (63.2%; $p$-value<0.01); computers (60.0%; $p$-value<0.01); recording and reproduction devices (53.0%; $p$-value= 0.04); photocopiers (45.0%; $p$-value=0.03); e-mail (43.4%; $p$-value=0.02); and the internet (39.3%; $p$-value=0.04) (Table 3). For other TD and ICT the participants also exhibited a reduction in the degree of difficulty, although the effect of training in this technology was not significant.

**Table 3.** Reduction in the degree of difficulty of participants in the use of cell phones, computers, photocopiers, the internet, e-mail and recording and reproduction devices: pre and post training. Curitiba, Paraná, 2017.

| TD/ICT | No Difficulty % | Some Difficulty % | A Lot of Difficulty % | $p$ |
|---|---|---|---|---|
| Cell phone (pre-training) | | Cell phone (pre-training) | | |
| No difficulty | 10.5 | 0.0 | 0,0 | |
| Some difficulty | 31.6 | 26.3 | 0,0 | <0,01 |
| A lot of difficulty | 0.0 | 31.6 | 0,0 | |
| Computer (pre-training) | | Computer (pre-training) | | |
| No difficulty | 0.0 | 3.3 | 0 | |
| Some difficulty | 36.7 | 33.3 | 3,3 | <0,01 |
| A lot of difficulty | 6.7 | 16.7 | 0,0 | |
| Photocopier (pre-training) | | Photocopier (pre-training) | | |
| No difficulty | 35.0 | 0.0 | 0,0 | |
| Some difficulty | 45.0 | 20.0 | 0,0 | 0,03 |
| A lot of difficulty | 0.0 | 0.0 | 0,0 | |
| Internet (pre-training) | | Internet (pre-training) | | |
| No difficulty | 21.4 | 3.6 | 0,0 | |
| Some difficulty | 35.7 | 32.1 | 0,0 | 0,04 |
| A lot of difficulty | 0.0 | 3.6 | 3,6 | |
| E-mail (pre-training) | | E-mail (pre-training) | | |
| No difficulty | 28.6 | 3.6 | 0,0 | |
| Some difficulty | 39.3 | 21.4 | 0,0 | 0,02 |
| A lot of difficulty | 3.6 | 3.6 | 0,0 | |
| Recording and reproduction devices (pre-training) | | Recording and reproduction devices (pre-training) | | |
| No difficulty | 29.4 | 0.0 | 0,0 | |
| Some difficulty | 47.1 | 17.7 | 0,0 | 0,04 |
| A lot of difficulty | 0 | 5.9 | 0,0 | |

TD= technological devices; ICT=information and communication technology.

Regarding the satisfaction of the participants with the training, in the individual analysis of the first item as a whole (satisfaction of the participants in relation to the training itself and the techniques covered), the score of the participants' responses in relation to the nine questions varied between 5.8% and 10.0%, with one participant describing moderate satisfaction and the rest of the sample exhibiting a great deal of satisfaction. In the second item (participants' satisfaction in relation to the trainer), the score of the answers, in relation to the 14 questions, varied between 7.9% and 10.0%, meaning that all the participants reported a great deal of satisfaction in relation to this scale item. In the analysis of item three (satisfaction of the participants in relation to the contribution of training to their personal lives), composed of three questions, the score of the answers varied between 6.3% and 10.0%, with three participants reporting moderate satisfaction and the others, a great deal of satisfaction (Table 4).

The score of the responses of all participants for each question ranged from 8.6% to 9.5% for the first item on the scale, from 9.3% to 9.7% for item two, and from 8.6% to 9.1% for item three. Thus, in general, the participants were very satisfied in relation to the three items evaluated on the scale and in relation to training as a whole.

Among the items listed by the participants in relation to satisfaction with the training, those that received higher scores were: the language used in the training material; the link between the proposed content and the training objectives; the link between the training content and the personal goals of the individual; guidance for solving errors in revision exercises; amount of content for each proposed theme. The lowest scores were in relation to: revision exercises and activities proposed at the end of the modules.

In relation to the trainer, higher grades were attributed to the items: he/she respected my learning pace; used language that was easy to understand; was always available and willing to help in question sessions (the researcher made herself available to answer questions from participants at times other than those intended for training); he/she considered the ideas of the participants; he/she changed the way of explaining until there was complete understanding.

As for the satisfaction with the contribution of training for the participants themselves, high marks were given and there was consequently a great deal of satisfaction regarding their ability to apply the knowledge taught in the training program in different situations, the assimilation of the course content and the ability to transmit the knowledge acquired in the training to other people (Table 4).

**Table 4.** Participant satisfaction with training carried out according to each question of the scale (N=30). Curitiba, Paraná, 2017.

| Satisfaction with training | Mean (standard deviation) |
| --- | --- |
| 1. Link between the proposed content and the training objectives | 9.3 (±0.91) |
| 2. Link between the training content and personal goals of individual | 9.3 (±1.06) |
| 3. Sequence of presentation of themes | 9.3 (±1.15) |
| 4. Language used in the training material | 9.5 (±0.96) |
| 5. Revision exercises | 8.6 (±1.56) |
| 6. Activities proposed at the end of the modules | 8.9 (±1.36) |
| 7. Guidance for solving errors in revision exercises | 9.3 (±1.01) |
| 8. Amount of content for each proposed theme | 9.2 (±0.99) |
| 9. Question sessions | 9.1 (±1.35) |
| Total | 9.1 (±1.35) |

Continuation of Table 3

| Satisfaction with the trainer | Mean (standard deviation) |
|---|---|
| 1. Encouraged to collectively discuss queries and questions | 9.5 (±0.76) |
| 2. Tried to understand the reasons that were hindering my participation | 9.5 (±0.81) |
| 3. Praised my participation in classes and in question sessions | 9.3 (±1.18) |
| 4. Made constructive criticisms | 9.3 (±0.91) |
| 5. Always present and willing to help in question sessions | 9.6 (±0.72) |
| 6. Respected my learning pace | 9.7 (±0.64) |
| 7. Considered participants' ideas | 9.6 (±0.60) |
| 8. Praised my performance during the training | 9.4 (±0.80) |
| 9. Provided answers that fully clarified my doubts | 9.5 (±0.76) |
| 10. Used his/her experiences with the themes and with the target population of the study during classes | 9.3 (±1.00) |
| 11. Used language that was easy to understand | 9.7 (±0.60) |
| 12. Indicated pathways to solutions instead of giving ready answers | 9.5 (±0.67) |
| 13. Changed the way of explaining until there was total understanding | 9.6 (±0.61) |
| 14. Integrated theory and practice in explanations | 9.5 (±0.72) |
| Total | 9.5 (±0.13) |
| Satisfaction regarding training contributions for the participant | Mean (standard deviation) |
| 1. Ability to apply the knowledge taught in training in different situations | 9.1 (±0.96) |
| 2. Assimilation of course content | 9.0 (±1.06) |
| 3. Ability to transmit the knowledge acquired in the training to other people | 8.6 (±1.52) |
| Total | 8.9 (±0.22) |
| Total average of the three items | 9.3 (±0.24) |

## DISCUSSION

In general, the results of this study contradicted myths and stereotypes [25-27] and proved that the participants of this study, after undergoing training that respected their limits, time and interests, were able to learn to use TD and ICT, demonstrating a significant reduction in the difficulty they experienced. It must be remembered, however, that the process of acquiring knowledge and skills to deal with technology was often difficult. In some cases, it took longer than expected for a function to be fully understood.

Literature points out that older workers can achieve learning outcomes equivalent to their younger colleagues, especially if the work content and tasks are designed to use past learning experiences, if sufficient time, practice and motivation are provided, and if age-related issues and the previous knowledge; skills; goals; attitudes; individual values and interests of workers are considered [9,20,28].

As for the satisfaction of the participants in relation to the training carried out, in the case of the present study, simple, low complexity training, performed individually, with specific duration for each participant, was fundamental for the participants to report experiencing positive satisfaction (a great deal of satisfaction); which complies with the items of impact described in literature to be followed when developing training, such as, for example, the ability of those receiving training to process and apply information, the provision of small amounts of information at a time, personalized materials with content sequencing, step-by-step instructions [29].

Furthermore, according to literature, for the satisfaction of participants to be guaranteed, it is extremely important that it is developed individually and, when possible, together with the individual to be trained [30,31]. It is essential that current training methods and teaching strategies are understood, and that the perception of older workers about each of these is known [30,32]. On the other hand, although the

participants of this study were highly satisfied with the material used, a lower score was attributed to the *revision exercises* item (8.6), which serves as a basis for the future improvement of training, especially in relation to that topic.

On the other hand, in relation to satisfaction with the trainer, the positive evaluations point to the importance that she represented for the effective accomplishment of the training. According to McCausland et al.[33] as well as trainers having expectations about training participants, these, in turn, have expectations about their coaches and their characteristics. According to Wood et al.[34], it is important that those responsible for training are sensitive and support older learners when they encounter challenges. The sensitivity of the trainer to the specific needs of the trainees, the flexibility of content, as well as the provision of more time to perform tasks, the provision of pleasant training environments and the use of clear and accessible terminologies are also considered important.[34].

Satisfaction in relation to the contribution of the training for the participant was associated with the perception of the workers about their abilities. After training, the workers gave high marks and reported a great deal of satisfaction with their ability to apply the knowledge taught in the training in different situations, assimilation of the course content and the ability to transmit the knowledge acquired in the training to others.

Another fact observed fact is that the participants were able to transfer what they learned in training to their workplaces, which, according to a report from the European Center for the Development of Vocational Training (CEDEFOP)[35], contributes to better experiences and day to day realities for workers in the workplace.

Despite the positive results, the present study presented some difficulties and limitations. One of the difficulties was in relation to the unforeseen circumstances of the participants, such as the time available for training and internal problems in the workplace, such as the non-functioning of equipment, difficulties in accessing the internet and the inability

to access certain sites, imposed by the workplace system. In these cases, the work environment was a barrier to the learning requested by the participants. Such facts contributed to the increase in the number of training sessions.

As for the limitations, it is believed that the sample composition, which involved participants with a high level of education and income, may direct the results towards a specific population only. However, it is believed that the present study, even with a small sample size, provides new reflections on the permanence of older workers in the labor market and raises important questions that may be reflected in future studies and research.

## CONCLUSION

The results of the present study indicated a reduction in difficulties in the use of technological devices and information and communication technology among older workers after training involving a simple, low complexity and participant-centered approach. In addition, after the training, the participants reported personal satisfaction, as well as satisfaction with the training.

The present study sought to provide contributions with regard to the gap in Brazilian bibliographic references on this subject. However, it does not exhaust the topic, but it brings to light relevant aspects to be addressed in future studies and research on the theme of the permanence of older workers in the labor market and the use of technology.

It is suggested that future studies involve the realization of training in the use of technology that addresses, instead of an individual program, groups of workers with similar difficulties, so that the results can be compared with, and even complement, the findings of this study. Another suggestion is to apply the study to other population segments (with different levels of education and income). It is also suggested that the view of employers regarding the permanence of older workers in the market is investigated, in order to understand how they are managing these changes, as well as their perception regarding the participation in training of their employees.

Deepening existing research and exploring areas yet to be studied contributes to the consolidation of the body of knowledge for professionals who are concerned with the skills necessary to use new technology and with the maintenance of older workers in the labor market. Furthermore, they contribute to proving the effectiveness and efficiency of training programs and to pressurize public policies and those of companies and private institutions to include in their agendas the question of population aging in a society in which technology is inexorably imposed.

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# The need for palliative care among patients with chronic diseases: a situational diagnosis in a university hospital

Maria da Penha Gomes Gouvea[1]  ID

## Abstract

*Objective*: To perform a situational diagnosis of a population hospitalized with chronic non-communicable diseases (NCD) who are potentially entitled to palliative care in a university hospital. *Method:* A quantitative study with document analysis was carried out. The analyzes were categorized by the following variables: baseline diagnosis, age, sex, readmission and PPS (Palliative Performance Scale) score. *Results:* Over two months of research among 631 hospitalized patients, 198 patients who were potentially entitled to palliative care were identified; 113 (57.1%) of whom were older adults. Cancer was the disease with the highest incidence among the surveyed, with 95 cases, and was more recurrent in the older patient group, with 52 cases (62.1%). Similarly, multiple hospitalizations were more prevalent in the older population, and patients diagnosed with strokes had the longest hospitalizations. *Conclusion*: The situational diagnosis carried out was relevant as it identified a group of patients, the majority of whom were older, who may be neglected in terms of their right to palliative care and an improved quality of death.

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[1]   Universidade Federal do Espírito Santo, Programa de Pós-graduação em Gestão Pública, Hospital Universitário Cassiano Antônio Moraes (HUCAM). Vitória, ES. Brasil

Correspondence
Maria da Penha Gomes Gouvea
mpgomesgov@gmail.com

## INTRODUCTION

The worldwide discussion about the need to implement palliative care (PC) in all healthcare settings has been growing, and is based around the definition of a comprehensive and integrated approach to care. The focus, therefore, remains on the multidimensionality of patients and their families facing advanced stages of disease, conditions generated by the prognosis of a life with limitations, and physical, psychological, spiritual and emotional impacts, regardless of the environment[1].

Within this new concept, PC combines the concept of interdisciplinarity with a proposal for universal access, in addition to preserving the values of compassion and commitment in care where there are situations of frailty and vulnerability. In a 2017 publication, a study found that less than 14% of the world's population has access to end-of-life PC, even though its effectiveness in helping patients and families and efficiency in providing care has already been proven[1].

Among the indicators used to define the need for PC are diagnostic conditions. Patients diagnosed with one or more Chronic Noncommunicable Diseases (CNDs) are eligible for PC[1]. Some studies have discussed the relationship between aging and CNDs, general conditions related to the demographic and epidemiological transition, especially in relation to the older population with CNDs[2,3].

As in developed countries, most deaths among older adults in Brazil are related to a CND and to cancer[4]. The Hospital Information System confirms that the hospitalization of older people is no longer comparable to that of younger people, and that older individuals undergo repeated hospitalizations when affected by CNDs[5].

CNDs are mostly disabling and lead the patient to a progressive functional decline prior to death. Thus, the development of planned actions focused on the implementation of PC in primary care, without limiting where such care is performed, is paramount[4]. Therefore, the relationship between population aging, the incidence of CNDs and the need for the expansion of PC should be seen as a challenge for Public Health managers at all levels of care in Brazil.

A study by Marcucci et al. identified a decline in physical and nutritional functions in primary care patients with one or more CNDs with disabling sequelae, who could have received PC[4]. In this context, it is important to emphasize that the implementation of PC practice focuses on protecting the independence and autonomy of the individual, as well as promoting social and family participation without neglecting social inclusion and quality of life[6,7].

There are already research groups in PC in Brazil that have sought to highlight the need for the expansion of this much needed line of care, in view of population aging and epidemiological change. These studies also underscore the need for increased financial incentives, the promotion of PC and the building of skills among health professionals across the country to minimize health disparities between regions[8].

Identifying patients in need of PC by classifying their functional status and level of care needed can be performed using the Palliative Performance Scale (PPS). PPS scores guide the care needed to maintain the integrity, comfort and dignity of patients and their families, promoting quality of life until death[1,9,10].

To plan the implementation of such care, however, it is necessary to identify the target population and define its characteristics. The purpose of the present study was to identify the population with CNDs admitted to a university hospital who were potentially able to receive palliative care.

## METHOD

A quantitative retrospective documentary study was conducted in a university hospital in southeastern Brazil. This institution provides primary, secondary and tertiary levels of health care and is a reference center in various specialties. The total number of patients admitted to the Hospital Universitário Cassiano Antônio Moraes (the Cassiano Antônio Moraes University Hospital) (HUCAM) in the months of March and April 2015 was 631. Of these, a total of 198 records were selected through the inclusion and exclusion criteria.

The inclusion criteria were: medical records of patients older than 18 years admitted with the diagnosis of at least one CND: AIDS, Alzheimer's, Cerebrovascular Accident/stroke (CVA), Cancer (CA), Chronic obstructive pulmonary disease (COPD), Chronic Heart failure (CHF), Chronic renal failure (CRF), Chronic liver failure (CRF). The exclusion criteria for this study were medical records of patients under 18 years of age, no diagnosis of CNDs, and patients in the Emergency, Gynecology, Obstetrics and Surgical Clinic sectors, as these departments have a high rotation, as well as patients in the Neonatal Intensive Care (NICU) and Pediatrics units, as they require different research tools and a specific approach.

The quantitative method was used in the identification and characterization of the specified population, through a data collection instrument developed by the researcher. The variables were: hospitalization unit, name, age, sex, referred from, diagnosis, date of hospitalization, readmission, outcome of patient (continued hospitalization, discharge or death) and PPS. Data collection was performed by a single evaluator.

The active search began with diagnoses of AIDS, Alzheimer's, CVA/Stroke, Cancer, Chronic Obstructive Pulmonary Disease (COPD), Chronic Heart Failure (CHF), Chronic Kidney Failure (CRF) or Chronic Liver Failure (IHC) ). After collecting personal data, the PPS scale was applied. This is a tool used to assess the degree of functionality of the individual through five categories: ambulation, activity and evidence of disease, self-care, oral intake and level of consciousness, as well as determining the level of intervention and evaluate prognosis[11,12]. Applying the PPS can confirm a need for Palliative Care, as well as guide decision making by identifying emerging forms of care[11]. During the research period, PPS was already being used as a care tool in the institution.

From the data obtained, the situational diagnosis of patients potentially able to receive PC was carried out.

The study was approved by the Ethics Research Committee of the Hospital Universitário Cassiano Antônio de Moraes under process Nº 1.123.626.

## RESULTS

According to statistics from the hospital itself, the availability of beds is between 236 and 277, with an average occupancy of 68.61% and an average stay of around 6.59 days. The average stay was 13.49 days in the units where the study was carried out, namely the ICU, Clinical/Medical, Nephrology and Urology. Hospital statistics indicate a total of 631 hospitalizations between March and April 2015 in the sectors where this study was conducted, from which the medical records of 198 patients who met the inclusion criteria were analyzed.

Table 1 presents the characterization of the variables that compose the study. Cancer was the main diagnosis among the older population, being present in approximately half (48%) of the analyzed medical records. Of the 95 patients aged 60-79 years, 53 had some type of cancer. If the older group is considered as all those over 60 years old, then older individuals represented 57.1% of the studied cases. There was a majority of men in the sample.

Most patients, 64.1%, had been admitted to the same hospital more than once. In the analysis of the crossing of the data found in the Outcome and PPS score variables, it was found that none of the patients with a PPS score between 70 and 100 died, and of the 57 patients in this category, 52 were discharged.

However, in the group of patients with PPS scores between 40 and 60, one patient died on the same day as hospitalization. Of the most severe patients, with PPS scores between 10 and 30, 14 were discharged during the survey. Most of the deaths in the surveyed group, 35 (97.2%), were among patients with a PPS score of between 10 and 30.

Table 2 shows that older adults had a longer average length of stay (27, sd±27) and (25, sd±19). The average length of stay of patients over 60 years old (27 days) represents almost twice the average hospital stay, based on hospital statistics.

Among the diagnoses sought in the research, the results of Table 3 show that CA had the highest incidence among respondents, with 95 cases, being more recurrent among older adults, with 59 cases

(62.1%). Of the 18 AIDS patients, 14 (77.8%) were 30 to 59 years old.

According to Table 4, of the diagnoses that caused multiple hospitalizations, most patients in all categories have already had previous hospitalizations in this hospital. Hospitalizations were more recurrent in patients with CHF. Among all the age groups analyzed, the highest percentage of readmission was among older patients, and among the 113 such individuals, four (65.4%) had already been admitted to this hospital due to the same disease.

**Table 1.** Characterization of the variables studied to elaborate the situational diagnosis of hospitalized patients (n=198) in a university hospital in Vitória, Espírito Santo, 2015.

| Category | n (%) |
|---|---|
| Diagnosis | |
| Aids | 18 (9.1) |
| Alzheimer's | 3 (1.5) |
| Cerebral Vascular Accident/Stroke | 5 (2.5) |
| Cancer | 95 (48.0) |
| Chronic obstructive pulmonary disease | 18 (9.1) |
| Chronic Heart Failure | 21 (10.6) |
| Chronic Liver Failure | 20 (10.1) |
| Chronic Kidney Failure | 18 (9.1) |
| Age range (years) | |
| Up to 29 | 10 (5.1) |
| 30 to 59 | 75 (37.9) |
| 60 to 79 | 95 (48.0) |
| 80 or older | 18 (9.1) |
| Sex | |
| Female | 81 (40.9) |
| Male | 117 (59.1) |
| Readmission | |
| No | 71 (35.9) |
| Yes | 127 (64.1) |
| Remained in hospital | 29 (14.6) |
| Death | 36 (18.2) |
| PPS (Palliative Performance Scale) | |
| 10 – Completely bedbound | 12 (6.1) |
| 20 – Completely bedbound | 20 (10.1) |
| 30 – Completely bedbound | 30 (15.2) |
| 40 – Bedbound most of the time | 22 (11.1) |
| 50 – Bedbound or lying down most of the time | 24 (12.1) |
| 60 – Reduced | 33 (16.7) |
| 70 – Reduced | 27 (13.6) |
| 80 – Complete | 21 (10.6) |
| 90 – Complete | 7 (3.5) |
| 100 – Complete | 2 (1.0) |

Source: Author's own (2015).

**Table 2.** Length of stay x age range and diagnosis of hospitalized patients (n=198) in a university hospital in Vitória, Espírito Santo, 2015.

| Category | Time (days) | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| | Minimum | Percentile 25 | Median | Percentile 75 | Maximum | Mean | Standard deviation |
| Age range (years) | | | | | | | |
| Up to 29 | 1.0 | 6.0 | 9.5 | 21.0 | 64.0 | 16.3 | 18.5 |
| 30 to 59 | 1.0 | 9.0 | 16.0 | 24.0 | 75.0 | 18.7 | 13.5 |
| 60 to 79 | 1.0 | 10.0 | 19.0 | 36.0 | 193.0 | 27.1 | 27.0 |
| 80 or more | 2.0 | 12.0 | 20.5 | 33.0 | 67.0 | 24.8 | 19.1 |
| Diagnosis | | | | | | | |
| Aids | 10.0 | 15.0 | 21.0 | 26.0 | 48.0 | 22.3 | 10.4 |
| Alzheimer's | 23.0 | 23.0 | 23.0 | 40.0 | 40.0 | 28.7 | 9.8 |
| CVA* | 8.0 | 22.0 | 33.0 | 75.0 | 100.0 | 47.6 | 38.5 |
| Cancer | 1.0 | 7.0 | 14.0 | 30.0 | 193.0 | 21.5 | 25.3 |
| CPOD** | 5.0 | 18.0 | 21.0 | 32.0 | 52.0 | 23.8 | 11.5 |
| CHF*** | 2.0 | 9.0 | 13.0 | 25.0 | 58.0 | 18.6 | 15.0 |
| CLF[a] | 1.0 | 10.5 | 14.5 | 22.5 | 73.0 | 18.7 | 15.8 |
| CKF[b] | 5.0 | 19.0 | 27.5 | 51.0 | 82.0 | 34.7 | 22.7 |

**Source:** Author's own (2015).

*CVA: Chronic Vascular Accident/Stroke; **COPD: Chronic Obstructive Pulmonary Disease; ***CHF: Chronic Heart Failure; [a]CLF: Chronic Liver Failure; [b]CKF: Chronic Kidney Failure.

**Tabela 3**. Diagnosis x age range in patients hospitalized at a university hospital in Vitória, Espírito Santo between March and April 2015.

| Diagnosis | Age range (years) | | | |
| --- | --- | --- | --- | --- |
| | Up to 29 | 30 to 59 | 60 to 79 | 80 or more |
| | n (%) | n (%) | n (%) | n (%) |
| Aids | 3 (16.7) | 14 (77.8) | 1 (5.6) | 0 (0.0) |
| Alzheimer's | 0 (0.0) | 0 (0.0) | 2 (66.7) | 1 (33.3) |
| CVA | 0 (0.0) | 2 (40.0) | 2 (40.0) | 1 (20.0) |
| Cancer | 4 (4.2) | 32 (33.7) | 53 (55.8) | 6 (6.3) |
| CPOD* | 0 (0.0) | 9 (50.0) | 6 (33.3) | 3 (16.7) |
| CHF** | 1 (4.8) | 5 (23.8) | 11 (52.4) | 4 (19.0) |
| CLF*** | 2 (10.0) | 11 (55.0) | 7 (35.0) | 0 (0.0) |
| [a]CKF | 0 (0.0) | 2 (11.1) | 13 (72.2) | 3 (16.7) |

**Source:** Author's Own (2015).

CVA: Chronic Vascular Accident/Stroke; *COPD: Chronic Obstructive Pulmonary Disease; *CHF: Chronic Heart Failure; ***CLF: Chronic Liver Failure; [a]CKF: Chronic Kidney Failure.

**Table 4**. Readmission x diagnosis x age range in patients admitted to a university hospital in Vitória, Espírito Santo in March and April 2015.

| Category | Readmission | |
|---|---|---|
| | No n (%) | Yes n (%) |
| Diagnosis | | |
| Aids | 4 (2.2) | 14 (77.8) |
| Alzheimer's | 1 (33.3) | 2 (66.7) |
| CVA* | 2 (40.0) | 3 (60.0) |
| Cancer | 40 (42.1) | 55 (57.9) |
| CPOD** | 7 (38.9) | 11 (61.1) |
| CHF*** | 4 (19.0) | 17 (81.0) |
| CLF[a] | 6 (30.0) | 14 (70.0) |
| CKF[b] | 7 (38.9) | 11 (61.1) |
| Age range (years) | | |
| Up to 29 | 4 (40.0) | 6 (60.0) |
| 30 to 59 | 28 (37.3) | 47 (62.7) |
| 60 to 79 | 35 (36.8) | 60 (63.2) |
| 80 or more | 4 (22.2) | 14 (77.8) |

Source: Author's Own (2015).

*CVA: Chronic Vascular Accident/Stroke; **COPD: Chronic Obstructive Pulmonary Disease; ***CHF: Chronic Heart Failure; [a]CLF: Chronic Liver Failure; [b]CKF: Chronic Kidney Failure.

## DISCUSSION

The representativeness of the older population in the research, with 113 such individuals (57.1%), corroborates the results of studies[4,13-15] that demonstrate the predominance of older patients among those occupying hospital beds. Functional disability, vulnerability, and limitations caused by CNDs require an interdisciplinary perspective on new public health practices, as the need for prevention, care, and rehabilitation can directly reflect public spending[4,13-15].

According to the findings, cancer was prominent in the results achieved, afflicting 48% of patients, of whom 62.1% were older adults, results confirmed by data from the National Cancer Institute[16], which confirm the increased incidence of cancer after 60 years of age.

In addition to the physical changes that generate limitations in daily life, the various realities experienced by younger individuals who develop a chronic disease are transformative and determinant in terms of social exclusion and the loss of functionality within the process of living with illness. This process limits human beings from projecting or planning the future, dulling their outlook and inhibiting questions about their illness[17].

The values of the PPS scale provide significant points for consideration, as identifying prognoses may indicate the need for intensified care[10,11]. In this study, patients with a PPS score of 70 (13.6%) had reduced ambulation and may have had their social lives put at risk, facing limitations in work and significant illness. However, they may still have been totally independent in self-care, have a complete level of consciousness, and have their intake affected, indicating the beginning of the intensification of their functional decline[11]. Patients with a PPS score below 70 should be approached by the palliative care team, with the aim of promoting the knowledge of disease progression, the maintenance of autonomy, presentation of care plans and advanced guidelines[11,13].

Interestingly, the 33 (16.7%) patients with a PPS score of 60 were at a high risk of "social death" and had reduced ambulation, and may have been incapable of hobbies or housework[1,11,13]. A patient

with a score below 60 denotes reduced intake and a complete level of consciousness or periods of evident confusion, vulnerability and loss of autonomy, with the manifestation of significant disease progression, leading to the need for occasional assistance[1,1].

The 46 patients (23.2%) with scores of 40 and 50 on the PPS scale were bedridden or spent most of the time sitting or lying down, with the extent of their disease manifested in the incapacity for any work or activity. These patients could no longer maintain their independence, requiring almost total assistance in daily activities. In addition to their decreased levels of consciousness, ranging from lucid to confused, these patients demonstrate a steep decline in almost all categories explored by PPS. The scale shows that patients with scores below 60 had a prognosis of up to 207 days[11,13].

Among the 30 patients with a score of 30 were those who were completely bedridden, incapacitated for any activity and had an extensive stage disease and were totally dependent on self-care, but maintained normal or reduced intake and level of consciousness ranging from complete to drowsiness or confusion. Patients with PPS scores below 30 had a high mortality rate and intensive and immediate care needs[11,13]. When estimating a patient's survival, sufficient time should be allowed to guide interventions through the definition of a care plan, allowing daily monitoring of the progression of the disease[11].

However, patients with PPS scores of between 10 and 20 already had a need for a high level of care, being fully bedridden and totally dependent on self-care, unable to perform any activities, and presenting drowsiness, confusion or coma. Of the 62 (31.4%) patients who had PPS scores of between 10 and 30, 35 unfortunately died during the survey. Predicting the life of the patient is essential for planning interventions within PC. A risk and benefit analysis of treatment may be based on prognosis. The PPS scale demonstrably serves the purpose of predicting patient survival time and guiding care[11].

The result of the present study confirms that hospitalization time increases with age[18], with the age group from 60 to 79 years old having the longest average length of stay. Concomitant with the increasing number of hospitalizations in the current context, an increase in the number of deaths in Brazilian hospitals has been observed, but in countries where access to palliative care is easier, deaths tend to happen at home or in a care facility[1,4,5].

Associating aging and loss of autonomy with the consecutive hospitalizations caused by CNDs underlines the urgency of implementing new lines of care, such as PC. The intensification of care becomes paramount, especially for older adults, as these individuals tend to verbalize their complaints less and less[10].

On the other hand, while it is known that prolonged hospitalizations and intensive care units represent a notorious and growing public expenditure in health[18], expanding PC practices in the current public health scenario may represent the provision of broad and ideal care to the older population, respecting their multidimensionality[13]. Discussions about the quality of services, criticism of the qualifications of professionals and poor quality of user care, signal the need for strategies to improve the management and performance rates of most Brazilian hospitals[10,18].

A study on Public Health entitled the *Principle of efficiency as a foundation for public policy and the effectiveness of the right to health*[19], supports the idea that efficiency can be achieved through timely and positive development in the health sector and that legality and morality characterize good management.

Using variables similar to the present study, the analysis of the length of hospitalization of older adults in a teaching hospital indicated an increase of chronic diseases and their complications, also emphasizing that CNDs are the most common causes of hospitalization among older patients. In this context, it is worth asking if increased life expectancy contributes to repeated and long hospitalizations[20].

## CONCLUSION

The situational diagnosis carried out indicated that a significant number of hospitalized patients were candidates for PC. The older population made

up the majority of the sample, and it was confirmed that such individuals with CNDs face readmissions and prolonged hospitalizations. The findings also reveal the need for a differentiated approach, since the predominant diagnosis in the study was cancer, a rapidly evolving disease among CNDs.

Thus, it is well known that implementing palliative care involves the need for a team with technical and multidisciplinary knowledge, with a multidimensional human perception capacity, so that interventions are timely and decisions are made to promote the quality of life of the patient. The inclusion and standardization of palliative care improves "quality of death", which could represent a huge gain for the quality of the Brazilian public health system.

The effectiveness of the PPS was proven by indicating the urgency of the need for PC, as almost all patients with a critical score died during the study period.

Given this scenario, it is emphasized that the implementation of palliative care should be recommended at diagnosis, thus maintaining curative treatment combined with the interventions required at the beginning of palliative care. In this way, depending on the evolution of the disease, PC can override curative medicine until such time as only such care can meet the emotional, social and spiritual physical needs of the patient and their family members, extending even to the mourning phase.

One limitation of this study is the momentary unavailability of medical records, the absence of data in such records, and the fact they are printed rather than electronic.

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Original Articles

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# Postural responses of galvanic vestibular stimulation: comparison between groups of older adults and young people

Regiane Luz Carvalho[1]
Matheus Machado Gomes[2]
Laura Ferreira de Rezende Franco[1]
Daniela Cristina Carvalho de Abreu[3]

## Abstract

*Objective:* To evaluate the effect of vestibular manipulation on the postural sway and muscle activation of younger and older adults. *Methods:* The study analyzed the effects of three intensity levels of galvanic vestibular stimulation (GVS) (0.3; 0.6 and 1m) on the pattern of muscle activity and center of pressure (CP) displacements of 12 older adults (EG) and 12 young adults (CG) while maintaining their balance on a stable surface, with no vision. *Results:* The EG showed a positive correlation between CP displacement and muscle activity and GVS intensity. On the other hand, the magnitude of postural response in the EG was not modulated in accordance with GVS intensities. Additionally, during the highest GVS intensity level (1 mA) greater muscle activity was used to increase stiffness, decrease the amplitude of oscillation and ensure stability. This unusual response characterizes a pattern of co-activation and is perhaps a safety mechanism to ensure stability. *Conclusion:* The EG individuals were not able to select the appropriate motor strategy to efficiently compensate the effects of GVS. This unusual strategy reflects deficits in the vestibular system of older adults, a fact which negatively interferes with their ability to reevaluate sensory information.

[1] Centro Universitário das Faculdades Associadas de Ensino (FAE), Departamento de Fisioterapia. São João da Boa Vista, SP, Brasil.

[2] Universidade de São Paulo, Faculdade de Medicina. Ribeirão Preto, SP, Brasil.

[3] Universidade de São Paulo, Faculdade de Medicina, Departamento de Biomecânica, Medicina e Reabilitação do Sistema Locomotor. Ribeirão Preto, SP, Brasil.

Correspondence
Regiane Luz Carvalho
regianeluzcarvalho@gmail.com

## INTRODUCTION

Postural control is performed by motor and sensory mechanisms ranging from relatively simple peripheral responses to complex events involving high levels of cognitive function and sensorimotor integration. With the aging process, there is a decline in motor and sensory functions, impairing postural stability and increasing the number of falls. Falls are a major public health problem in the older population. As people age, the incidences of falls increases. According to the World Health Organization, between 28-35% of people aged 65 and over fall each year and this number rises to 32-42% from the age of 70[1]. The resulting injuries can lead to reduced levels of independence, poor quality of life, and high levels of anxiety[1].

It is therefore vital that any risk factors associated with instability and falling are identified early. Early detection of these factors can guide preventive programs, making them more efficient and less costly. However, several risk factors contribute to postural instability, and these can impair the detection of specific causes of a decline in instability.

Possible explanations for the increased risk of falls include cognitive limitations[2], musculoskeletal changes such as reduced bone mineral density[3], a reduction in the number of muscle fibers, which alter muscle length changes and reduce strength[4], a decline in knee and ankle joint torque[5,6], slower muscle response after an external disturbance [5,7], sensory changes such as a reduction in spatial perception[8], compromised vestibular information[9], reduced visual acuity and less sensitivity to contrasts[10], reduced skin sensation [11] and proprioceptive changes[12].

There is no consensus about which system (sensory, motor or cognitive) exerts the greatest influence over the decline of postural control among older adults. Krager[13] suggests that changes in the vestibular system are an important contributor to such a decline. Other studies that support the idea of decline of the vestibular system are those that describe the anatomical changes resulting from aging, among which the loss of sensory hair cells[14,15] and vestibular nucleus neurons[16] are of particular relevance.

The role of the vestibular system in postural control can be studied by artificially manipulating the vestibular afferences by applying galvanic current (continuous bipolar) to mastoid processes by depolarizing the vestibular nerve and increasing the triggering frequency of vestibular afferents on the cathode side, while decreasing the afferents on the anode side[9]. Such application results in body sway to the anode side. This behavior is similar to that observed in individuals with vestibular system disorders, and allows a more specific assessment of vestibular information by inducing postural reactions during static posture maintenance. It is therefore a useful way of studying the role of vestibular information in the postural control of older adults[13,17].

Considering the decline of sensory information as a relevant factor in the postural control of older adults, as well as the fact that this control depends on a complex integration of multiple sensory systems (including the vestibular system), the study of the affect of three intensities of galvanic vestibular stimulation (GVS) on the postural oscillation of the older adults was proposed.

## METHOD

A quantitative cross-sectional study was carried out with a sample of 12 older adults (EG) and 12 younger adults (CG) resident in the community of Ribeirão Preto, São Paulo, Brazil. The evaluated group was selected from unintentional convenience sampling, based on participation in social groups for the EG and from the university for the CG, due to the difficulty of random selection.

Participants were invited to participate voluntarily. All were informed of the objectives and procedures of the study and were asked to sign a Consent Form approved by the research ethics committee: CAA 0245.0.213,000-10.

The population sample consisted of the following inclusion criteria: aged 65 years or older for the EG and 18 for the CG; be able to walk without an assistive device and have a MMSE score above 22 points.

Individuals with mobility deficits (unable to walk for six meters independently), unstable or severe health conditions, such as strokes, Parkinson's disease, Alzheimer's disease, epilepsy, who used pacemakers, had suffered neuropathies, had previously suffered vestibulopathies and who were unable to understand the simple instructions necessary for performing the required tasks were excluded.

The individuals went to the Balance Evaluation and Rehabilitation Laboratory (or LARE) of the Faculty of Medicine of Ribeirão Preto (FMRP - USP) where data collection was performed during a session with a duration of approximately 90min.

To evaluate cognitive function, history of dizziness, functional mobility and activities of daily living, the Mini Mental State Examination (MMSA)[18], Performance Oriented Mobility Assessment (POMA)[19], Dizziness Handicap Inventory (DHI)[20] and the Lawton Instrumental Activities of Daily Living scale (IADL)[21] were administered.

The subjects were required to maintain a motionless stance for 10s while barefoot on a force plate and under four different conditions (Chart 1). The center of pressure (CP) displacement and electromyographic (EMG) activities of certain postural muscles were recorded. The investigator ensured that the feet of the subjects were arranged on the center of the force plate. To control for prediction, habituation and fatigue, the four conditions were randomized and repeated three times for each individual, totaling 12 trials per subject.

**Chart 1**. Tasks analyzed during the maintenance of static balance on a force platform. Ribeirão Preto, SP, 2017

| Tasks | Sensorial Stimulation |
|---|---|
| 1 | Eyes closed without stimulation |
| 2 | Eyes closed with GVS of 0.3 mA |
| 3 | Eyes closed with GVS of 0.6 mA |
| 4 | Eyes closed with GVS of 1.0 mA |

GVS: Galvanic vestibular stimulation

The bipolar and binaural transmastoid current was randomly applied via 3.5 cm² carbon-rubber electrodes placed behind the ears of the subjects over the mastoid processes. The anode was placed on the right ear. The intensities applied were 0.3, 0.6 and 1mA.

## Data analysis

Posture sway was quantified using the CP while standing on a force platform covering an area of 50x50 cm² (model Biomec400, EMG System Brazil). This force platform was composed of four load cells at each corner, and the vertical load applied to each cells was measured. These loads were simultaneously acquired at a 100 Hz sampling frequency with a 12-bit resolution A/D card. From these signals, the resulting vertical ground reaction force and CP position in both the anterior-posterior and mediolateral directions were calculated. The true location of the CP at this force plate had a mean error of 0.02 cm from the factory calibration. The CP signals were filtered through a low-pass, fourth-order Butterworth filter with zero-lag at a cut-off frequency of 10 Hz. To quantify body sway, the amplitude and standard deviation (SD) of CP displacement were calculated in the respective directions.

The electromyographic (EMG) activity of the gastrocnemius medialis (GM), tibialis anterior (TA), biceps femoris (BF) and rectus femoris (RF) muscles were recorded using electromyography (EMG System do Brasil). Self-adhesive Ag/AgCl bipolar surface electrodes were used at an inter-electrode distance of 2 cm. The electrodes were connected to a 16-channel signal conditioner (EMG Systems Brazil). The electromyography signals of the muscles

were digitally recorded using an A/D converter board with a 16-bit dynamic resolution. The sampling frequency was set at 2 KHz with an input range of ±10 V. The electromyography signal was filtered through a Butterworth pass-band filter (20-500 Hz)

The root mean squares (RMS) of the four muscle activities cited above were calculated for each trial, and the values were normalized by maximal voluntary contraction.

## Statistical analysis

Data analysis employed descriptive statistics. For the quantitative variables, measures of central tendency (mean) and dispersion (standard deviation) were calculated. For values measured in an ordinal scale (MMSE, POMA, DHI), it was decided to use a nonparametric test for independent samples, namely the Mann-Whitney U test for comparison between groups.

Analysis of variance (ANOVA) was used to verify if the GVS intensities (0, 0.3, 0.6 and 1 mA). had different effects on the activation (RMS value) of each evaluated muscle. Considering the objective of evaluating the effect of intensity on muscle activation, intra-group analysis was selected.

For the comparison between the groups, the values of antero-posterior and mediolateral center of pressure displacement were used, and the displacement in each direction was analyzed by ANOVA with two factors: stimulation x group. The significance level was set at 0.05.

The relationship between CP displacement x GVS intensities and muscle activation (RMS) x GVS intensities was calculated using Pearson's linear correlation coefficient.

## RESULTS

A total of 24 individuals divided into two groups participated in the study. The older adults group (EG) composed of 12 volunteers (75±8.86 years, eight women and four men, BMI of 26.21±4.86) living in the community of Ribeirão Preto; and the Control Group (CG) composed of 12 adults (23±5 years nine women and three men, BMI 24.32±4.20), who were undergraduate students of the physiotherapy course at USP.

There was no significant difference between the groups on the Lawton scale. The CG achieved the maximum score of 27, with a similar performance among the EG (Table 1).

**Table 1**. Scores of Lawton Scale, MMSE, DHI e POMA in the control group (n=12) and older adult group (n=12). Ribeirão Preto, São Paulo, 2017.

| Instruments | Groups | Mean (standard deviation) | p-value |
|---|---|---|---|
| Lawton | CG | 27(±0) | 0.17 |
|  | EG | 26.3(±2.3) |  |
| MMSE | CG | 29(±1.3) | 0.02* |
|  | EG | 26.16(±2.7) |  |
| DHI | CG | 0.83(±8.5) | 0.16 |
|  | EG | 2.33(±5.5) |  |
| Poma | CG | 57(±0.0) | 0.00* |
|  | EG | 54.66(±2.4) |  |

Lawton=Instrumental Activities of Daily Living Scale, MMSE=Mini Mental State Examination, DHI=Dizziness Handicap Inventory, POMA=Performance Oriented Mobility Assessment; *$p<0,05$.

There were no statistical differences in DHI between the two groups, which was expected as vestibular disorders were an exclusion criteria. DHI assesses possible vestibular changes in three dimensions: physical, emotional and functional. The worst performance score observed in EG individuals was 100 points, a value that did not indicate vestibular deficits.

In contrast, a significantly different effect was observed between the groups in the MMSE and the POMA. Notably, however, the values obtained by the older adults in both the MMSE (over 27 points) and POMA (over 46 points) do not indicate cognitive or mobility impairments (Table 1).

## EMG Activity

The analysis of muscle activity during the maintenance of balance, with or without the three intensities of GVS, indicated that for the EG, the higher the stimulus intensity, the greater the muscle activation. Thus, with increased magnitude, the muscles responded in a linear fashion (as can be seen from the correlation coefficient values above 0.9 presented in Figure 1). The 9% increase in TA muscle activity during 0.3 mA GVS in relation to the activity without stimulus (12% during 0.6 mA and 27% at a current of 1 mA) is notable. Other muscles demonstrated similar behavior. The GM increased by 10%, 16% and 47%; the BF increased by 13%, 20% and 35%; and the RF increased by 20%, 22% and 25%, at intensities of 0.3, 0.6 and 1 mA, respectively.

The muscle activity of the EG also increased with GVS, but not in the same linear fashion (Figure 1). There was a decrease in muscle activity of 4% for the TA, 6% for the GM, 3% for the BF and 0,5% for the RF at 0.3 mA GVS, compared to activity without stimulus. At 0.6 mA of GVS, the activities of the TA and GM were similar to their activities at 0.3 mA, while the BF decreased by 5% and the RF decreased by 7%. At 1 mA of GVS, the activity of all muscles increased: 43% for the TA, 54% for the GM, 37% for the BF and 42% for the RF. For the EG, muscle activity increased primarily at higher GVS intensity levels.

For the CG, ANOVA testing showed no intensity effect for the TA ($F=2.25$; $P=0.14$), RF ($F=2.10$; $P=0.16$), GM ($F=15.47$; $P=0.04$) and BF ($F=7.10$; $P=0.013$) muscles. For the EG, ANOVA testing showed no intensity effects for the previously mentioned muscles.

## CP displacement

It was note that in the CG, a positive correlation between GVS intensity and postural oscillation was observed when evaluated by amplitude (Figure 2) and SD (Figure 3) of CP in an anterior to posterior (AP) direction. The correlation coefficient values are greater than nine. Although the medial to lateral (ML) displacement also increased with GVS intensity, linear behavior was less evident in this direction.
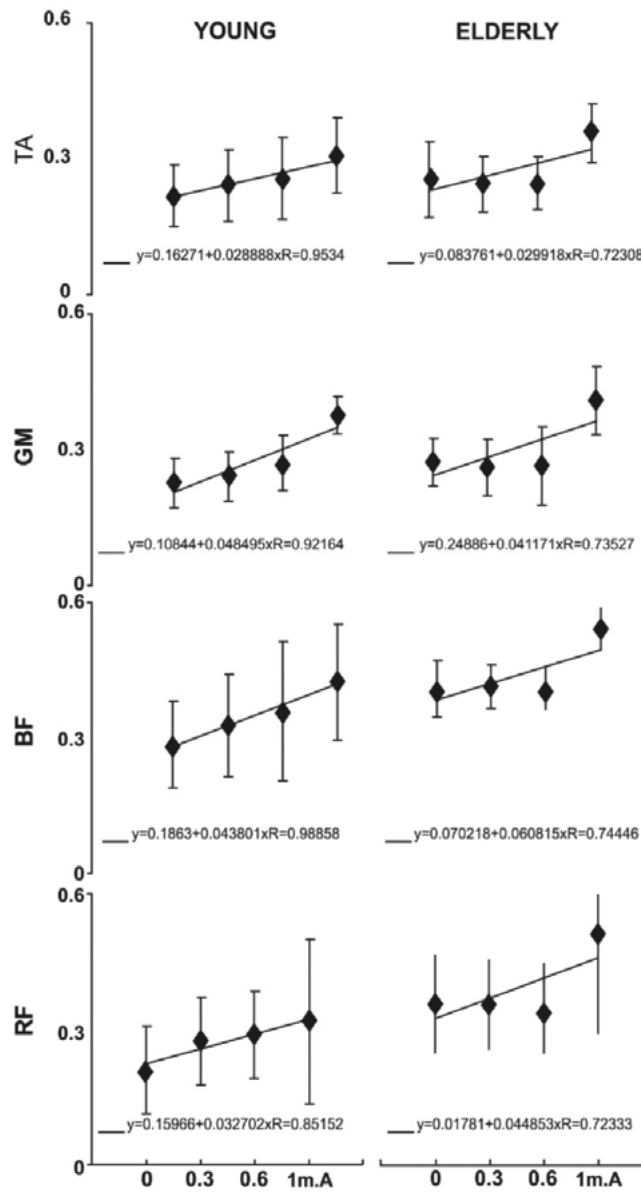
**Figure 1.** EMG activity of the tibialis anterior (TA), gastrocnemius medialis (GM), biceps femoris (BF) and rectus femoris (RF) muscles during upright balance analysis on the force platform associated with different intensities of galvanic vestibular stimulation (0, 0.3, 0.6 and 1 mA) in the younger adults (Control Group) and older adults groups. Ribeirão Preto, São Paulo, Brazil, 2017.

**Figure 2.** Amplitude for the displacement of CP (cm) in medial to lateral direction (ML) (upper panel) and anterior to posterior direction (AP) (lower panel) during different galvanic vestibular stimulation (GVS) intensities (0, 0.3, 0.6 and 1mA) for the CG (left panel) and EG (right panel). Correlations between GVS intensities and Amplitude of CP displacement were also presented. Ribeirão Preto, São Paulo, Brazil, 2017.



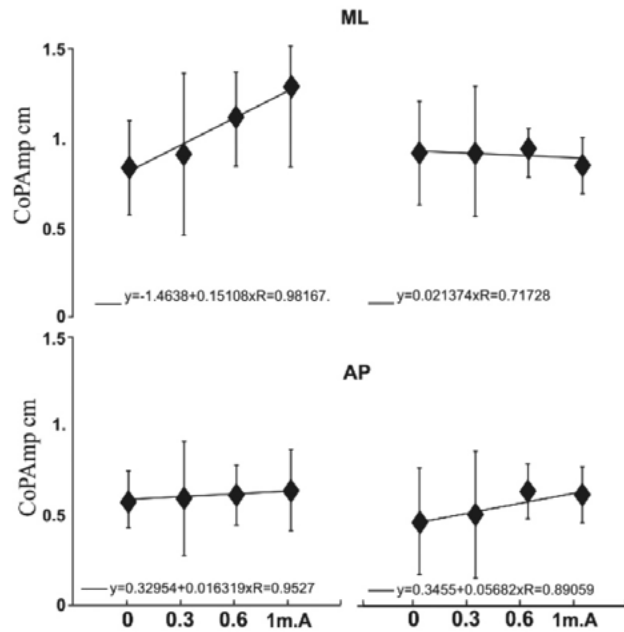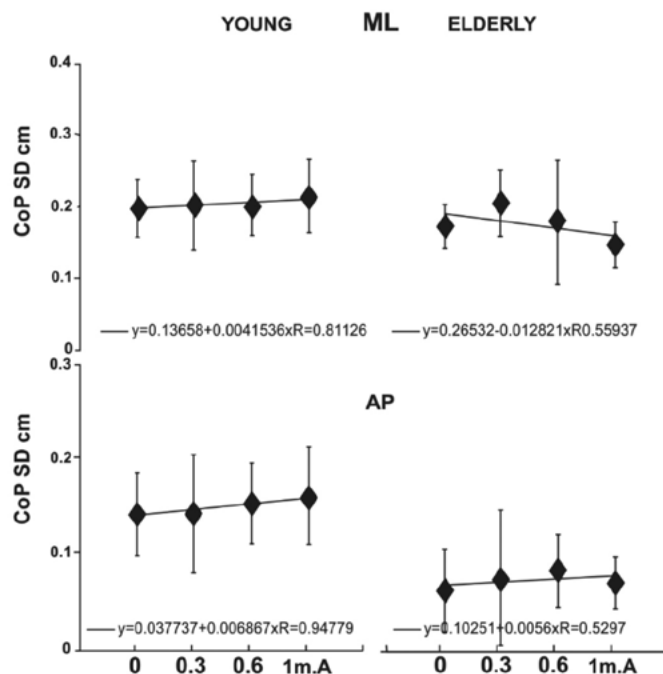**Figure 3.** Standard deviation for the displacement of CP (cm) in medial to lateral direction (ML) (upper panel) and anterior to posterior direction (AP) (lower panel) during different galvanic vestibular stimulation (GVS) intensities (0, 0.3, 0.6 and 1 mA) for the younger adults (CG) and older adults (EG) groups. Ribeirão Preto, São Paulo, Brazil 2017.

The EG were not able to modulate any postural oscillation with the GVS intensity (see the low values of correlation coefficients in Figures 2 and 3). They also showed a minor postural oscillation towards the AP direction during the 3 intensities of GVS, compared to the CG (amplitude F=0.00; P=0.04) (SD F=9.60 P=0.03).

## DISCUSSION

The present study compared postural sway and EMG muscle activities in a motionless stance between older and younger adults. In addition, the correlation between postural sway and the magnitude of GVS stimulation was measured. The primary findings for the CG were that (1) there was a significant increase with GVS in the GM and BF muscle activity, and (2) there was a positive correlation between postural response and GVS intensity. The main findings for the EG were that (3) these individuals were not able to modulate the magnitude of postural response with the intensities of GVS stimulus, and (4) they responded only to high levels of GVS intensity, indicating a possible deficit in vestibular information processing.

Increasing the intensity of GVS among the CG also increased the anterior postural response. This finding corroborates the studies of Horak & Hlavacka[22], who observed a proportional increase in body displacement with increasing intensity levels of GVS. This observation demonstrates the ability of the vestibular system to differentiate between graded levels of information and contributes to an altered response in magnitude.

The intensity required to trigger postural sway in the CG was similar to that found by Lee et al.[23]; Hlavacka et al.[24] and Inglis et al. [25], who reported an intensity level of 0.2 to 0.5 mA. In addition, Rinalduzzi et al.[26], demonstrated that even at 0.7 mA, GVS modulates neuronal excitability and produces recordable vestibular body sway in healthy subjects.

The effect of GVS observed in the AP direction is in agreement with literature, which demonstrates that bilateral stimuli induce increased oscillation by modulating the rate of triggering vestibular nerves[26]. Sway is influenced according to head position (in the present study turned to the right), towards the side

of the anodal electrode, by modulating the firing rate of the vestibular nerves.[26] Taking these concepts together with the head position adopted in the present study, it is possible to justify the significant effect of GVS only on the posterior muscles (i.e., the GM and BF muscle groups).

The most important findings relate to the inability of the EG to modulate their postural responses with GVS intensity and that they respond only to higher levels of GVS intensity. Although the effects of GVS on the older adults are less explored, several studies have evaluated vestibular function through vestibular evoked myogenic potential (VEMP)[27]. The effect of age on VEMP amplitude is well established, and numerous studies have determined the decrement in amplitude among individuals older than 60 years[1,28]. Although the techniques are different, the outcomes between studies of VEMP and GVS are similar, indicating a decreased response with age. This decrement can be attributed to age-related changes in the vestibular system, such as the loss of sensory hair cells[14] and the degeneration of vestibular nerve fibers in the Scarpa's ganglion cells[15] and the vestibular nucleus neurons[16]

Aoyamak et al.[26] found a lower postural response to a GVS level of 0.7 mA in individuals with vestibular disorders. They justified this finding by claiming that GVS was unable to modulate the function of the vestibular system as it would already be impaired by dysfunction. In this sense, the lower response to GVS observed at low intensities in the older adults in the study could be explained by the presence of dysfunction in this system.

However, with a greater level of GVS intensity (1mA), an increase in muscle activity was observed that increased stiffness, decreased the amplitude of oscillation and ensured stability in the EG. These unusual responses characterize a pattern of coactivation and may be a safety strategy assumed to ensure stability due to sensorial reorganization impairments in the older adults.

It is well established that older adults undergo somatosensory changes, which according to some authors, are responsible for a decline in postural control[5,29,30]. It is also known that individuals with somatosensory deficits increase the sensitivity of

vestibular information and consequently increase their response to GVS. Therefore, one would expect that due to somatosensory deficits, the response of older adults to GVS will increase. This behavior occurred only during greater stimulation (1 mA), and even then, the postural response was atypical. This finding supports the idea that when the vestibular system of older adults is compromised, it negatively interferes with their ability to reevaluate sensory information.

It is important to highlight certain limitations of the present study, in relation to the non-randomness of the sample selection and the sample size. This fact prevents possible generalizations for the Brazilian population, and the results should be considered as preliminary. In terms of gerontological care, the results suggest that multiprofessional health teams should be aware of the presence of sensory processing disorders and their impacts on postural control in older adults.

## CONCLUSION

The EG individuals were unable to select the appropriate motor strategy to efficiently compensate the effects of GVS. They responded only to high intensity GVS, indicating the alteration of the vestibular system response threshold. This atypical strategy may reflect deficits in the vestibular system and negatively affect the ability to reorganize sensory information, impairing the efficiency of postural responses when faced with sensory information inaccuracy. Guidelines should be given to older adults in relation to the risk of imbalance in relation to sensory conflicts, and sensory manipulation should be considered as an auxiliary resource in rehabilitation programs aimed at improving the postural control of older adults.

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Original Articles

1 of 11

# Protocol for the evaluation of chewing among older adults

Luiz Felipe Ferreira de Souza[1]  ID
Licinio Esmeraldo da Silva[2]  ID
Pantaleo Scelza Neto[1]  ID

## Abstract

*Objectives:* To evaluate the functional and physiological structures of the stomatognathic system of the oral cavity of older adults based on self-perception, comparing the same with a professional clinical evaluation, and investigating the difficulties encountered when chewing. *Method:* An analytical cross-sectional study with a quantitative approach was conducted with a sample of 53 older adults aged 60 to 90 years. A protocol consisting of three questionnaires was used: a sociodemographic evaluation, a self-perception based interview with 19 questions on the chewing of the older adults and a clinical evaluation containing 30 questions covering aspects of the oral cavity tissue. The self-perception and clinical evaluation scores were compared using the Mann-Whitney test and the proportions observed for each item were compared by the binomial test. *Results:* It was found that the self-perception of older adults did not correspond to the result of the clinical evaluation. While 31 (58.5%) reported satisfaction with chewing, 16 (30.2%) had high/very high impairment and 14 (26.4%) moderate impairment, based on the results of the clinical evaluation found. *Conclusion:* It was found that the chewing analysis process cannot be exclusively based on the answers provided by the older adults, and assessment proved to be more accurate when combined with a clinical evaluation performed by a professional.

[1]  Universidade Federal Fluminense (UFF), Faculdade de Odontologia, Departamento de Odontologia, Programa de Pós-graduação em Odontogeriatria. Niterói, RJ, Brasil.

[2]  Universidade Federal Fluminense (UFF), Instituto de Matemática e Estatística, Departamento de Estatística. Niterói, RJ, Brasil.

*Correspondence*
Luiz Felipe Ferreira de Souza
lumadaragu@gmail.com

## INTRODUCTION

Health promotion and the prevention of oral cavity disease should extend, without fail, to old age. In an attitude that differs from those of the past, the proper maintenance of the oral cavity has become a challenge for the older adult population and oral health professionals[1].

Chewing is an important function of the stomatognathic system, as it begins the digestive process. It is aimed at the mechanical degradation of food, reducing it to an appropriate size for swallowing[2]. However, the functionality of the system changes during the human aging process due to often irreversible anatomical, physiological and metabolic transformations[3,4]. This change is also evident in our day-to-day clinical approach when older adults begin to have discomfort when chewing[5,6]. The frequency of dental care and the availability of dental services can affect the number of teeth remaining in the later stages of life[7-9].

The availability of reliable assessment tools to identify the factors that influence dental practices is important for both understanding and designing effective interventions to promote the quality of life of the population[10].

In this context, the present study aimed to analyze the chewing physiology of older adults, based on their self-perception, and to compare this with a professional clinical assessment, as well as investigate the difficulties encountered when eating.

## METHOD

The study had a quantitative, exploratory, descriptive, observational nature, involving the voluntary participation of a group of older adults receiving care at the Dentistry Clinic of the School of Dentistry and the Reference Center for the Health Care of Older Adults of the Antônio Pedro University Hospital of the Universidade Federal Fluminense (Fluminense Federal University), Niterói, Rio de Janeiro, Brazil.

The construction of the protocol for the assessment of the chewing of older adults was carried out in three stages: the first involved the construction of the protocol instruments, the second the application of the protocol and the third the analysis of the data of such application.

The protocol can be applied in hospitals, long-term care facilities, outpatient clinics and even during home visits, and requires a professional qualified in dentistry, preferably in dentistry for older adults. Individual, disposable protective material should be used in the clinical assessment (glove, cap, mask, tongue depressor), and there should be no need for a special environment or specific dental equipment.

The implementation process proposed by the protocol followed the sequence of the SB2000[11] examiner's manual, with an application time of 20 minutes for each session. The evaluating professional should obtain the information while avoiding unidirectional, dogmatic and authoritarian communication in decision making[12].

### First stage: Construction of the instrument

The protocol designated as the test for the Clinical Assessment of the Chewing of Older Adults (or TAC-MI) is an instrument for the screening of the chewing of older adults, identifying difficulties and deficiencies resulting from the aging process. The protocol has three questionnaires: a) Patient identification; b) Self-Perception of Chewing Scale; c) Clinical Assessment of Chewing Scale.

The first questionnaire aims to obtain data of a sociodemographic nature. The second questionnaire corresponds to information on the chewing of older adults, consisting of a set of 19 items (questions aimed directly at older adults), all with dichotomous answers of equal weight (yes/no) generating a summative scale regarding the perception of the older adults themselves regarding their chewing.

The responses of each item were coded by the values 1 (yes) and 0 (no), indicating, respectively, the positive and the negative aspects of chewing. With the exception of items "A, J, K, L and R", the coded values of all the other items must be reversed. The scores of this scale range from 0 to 19, with the

lowest values indicating the reduction of chewing based on the responses of the older adults.

The third questionnaire consists of a clinical assessment (analysis obtained directly from the oral cavity of older adults) performed by a professional. Consisting of 30 items on a dichotomous scale of equal weight (yes/no), it is structured into six domains of the stomatognathic system: dental, soft tissue, salivation, swallowing, musculoskeletal-articular, and proprioceptive. Like the previous instrument, values 1 and 0 were used to encode the positive and negative responses, respectively. Except for the items "AA, AB, AC, DE, EA, FB, FC and FD", the coded values of all other items should be reversed. This step generates a summative scale, the impact score of which corresponds to the chewing of older adults from a technical perspective. The score on this scale ranges from 0 to 30, with the lowest values indicating the reduction of chewing from a clinical point of view.

In order to encourage the best possible interpretation by the professional practitioner, a symbology was incorporated for each question, where a positive answer was identified by a small green face and a cheerful expression, and a negative answer marked with a red face with a sad expression, next to the other face. No items that assessed chewing strength and its cycles were included, as the strategy adopted was aimed to the conditions of the included structures.

After applying the questionnaires, the subjective classification of the degree of chewing impairment of the older adults continues using a five-point Likert[13] scale ranging from 1 to 5 points, from the most impaired to the least impaired. At the end of the assessment, the individual is referred to an appropriate specialist, and the reasoning behind this decision is explained. The test can only be accessed through the link "<www.issuu.com/luizfelipeferreiradesouza>".

## Second stage: Application of protocol

The TAC-MI methodology was applied in two phases: a Pilot Study and an Execution Phase.

When selecting patients for the application of TAC-MI, in both phases, the following criteria were considered: age from 60 to 90 years; literate; of both sexes; independent in basic activities of daily living (assessed by the Katz index)[14], independent in feeding oneself; having the cognitive ability to understand and answer the questions (verified based on the result of the Mini Mental State Exam[15] available in the patient's medical record). Older adults who had walking difficulties and used drugs that altered their cognitive state were excluded. Also excluded were those who had serious problems with chewing, such as: recent surgery or trauma; trismus of the jaw; birth defects; pain and/or discomfort that prevented the application of the test.

The Pilot Study was carried out in the premises of the Dentistry Clinic of the School of Dentistry of the Universidade Federal Fluminense. This phase was intended to adjust the instruments of the TAC-MI, and involved four professional dental surgeons and four older adult users of the clinical services. All professionals were trained and calibrated in the standard TAC-MI application procedure.

The adjustment of the protocol questionnaires, Self-Perception of Chewing Scale (chewing from the perspective of older adults) and the Clinical Assessment of Chewing Scale (chewing of older adults from a professional perspective) was performed based on agreement between the four dental students for each older adult, resulting in 16 applications.

Within the agreement criteria, it was established that if the average proportion of concordant evaluations per patient in each item was equal to or greater than 75%, the item would be accepted without change; proportions below this percentage should undergo revision of the item before it is accepted as an integral part of the scale.

The Execution Phase was performed by the relevant researcher in the Reference Center for the Health Care of Older adults, located in the University Hospital of the educational institution. The target population consisted of 84 older adults, according to the Reference Center records, who were invited to participate in the study. Participation was voluntary and generated a sample of 53 older adults who met

the inclusion criteria. There was no exclusion of volunteers who joined the project. Execution from the projects was methodologically limited, due to restrictions on the times when respondents were available in the health institutions.

### Third stage: Data analysis

The collected data were obtained from October 2015 to March 2016 and stored on data sheets. The TAC-MI scale scores were statistically described as mean and standard deviation.

Comparisons of scores between the male and female sex variable were performed using the Mann-Whitney test. The relationship between the TAC-MI questionnaire scores was evaluated using the Spearman correlation coefficient (rs) and the internal consistency of these questionnaires was assessed by the Cronbach's alpha coefficient. Statistical decisions made in the hypothesis tests used a significance level of 5% (0.05).

The study was approved by the Research Ethics Committee of the Antônio Pedro University Hospital under Opinion No. 1,184,545 dated July 17, 2015. All ethical and legal aspects contained in the Declaration of Helsinki, Resolution No. 466/2012 of the National Health Council and Federal Council of Dentistry (CFO) Resolution No. 118/2012 were complied with. All the volunteer participants were informed in accessible language about the proposed study and signed a Free and Informed Consent Form.

## RESULTS

The adequacy of the methodology was confirmed in the Pilot Study, where a level of agreement greater than or equal to 0.75% was found among all the data extracted and collected for all the items applied by the health professionals, without the need for adjustment.

The findings in the Execution Phase, in relation to sociodemographic profile, revealed a majority of women and retirees, with a low/medium level of education (Table 1).

**Table 1**. Sociodemographic profile of sample (N=53). Niterói, Rio de Janeiro, 2016.

| Variables | n (%) |
|---|---|
| Age (mean and standard deviation) | 73.8 (±6.6) |
| Sex | |
| Male | 14 (26.4) |
| Female | 39 (73.6) |
| Skin color/ethnicity | |
| White | 28 (52.8) |
| Black | 25 (47.2) |
| Schooling (years) | |
| <5 | 20 (37.7) |
| 1-5 | 9 (17.0) |
| 5-8 | 16 (30.2) |
| >8 | 8 (15.1) |
| Occupation | |
| Retired | 37 (69.8) |
| Homekeeper | 16 (30.2) |
| Marital status | |
| Single | 7 (13.2) |
| Married | 27 (51.0) |
| Divorced | 5 (9.4) |
| Widowed | 14 (26.4) |

Of the responses collected from the Self-Perception Scale questionnaire, the majority said they were satisfied and did not experience difficulties, discomfort or insecurity when chewing. There were also high scores for the habit of breaking up foods, a preference for liquid and paste-based foods, and not suffering tiredness when or difficulties swallowing when chewing. The low frequency of dental appointments and the almost complete presence of prolonged medical treatment were also noteworthy (Table 2).

The scores produced, observing the coding reversals of the items, ranged from 5 to 19 points in the sample, with a mean of 13.8 ($\pm$3.4) and a median of 14 points. The distribution of scores did not include any scores indicating an atypical situation. There was no statistically significant difference in the scores between men and women, whose median values were 14 and 13.5 points, respectively (Mann-Whitney test U =236.5; $p$-value=0.459). The correlation between age and self-perception score was irrelevant ($r_s$=0.115) and not statistically significant ($p$-value=0.410). The Cronbach's alpha coefficient observed was 0.79, indicating good instrument reliability.

In the Clinical Assessment of Chewing Scale questionnaire, most individuals had a high percentage of tooth decay, maladjusted dentures, malocclusions, tooth wear, few teeth in their mouths, and soft tissue sagging. Percentage equality was observed in terms of the presence of choking, coughing and throat clearing when swallowing (Table 3).

**Table 2**. Percentages of responses by older adults in the Self-Perception of Chewing Scale (N= 53). Niterói, Rio de Janeiro, 2016.

| Items | Description | n (%)* Yes | No | $p$-value |
|-------|-------------|-----|-----|---------|
| A | Satisfaction with chewing | 31 (58.5) | 22 (41.5) | 0.169 |
| B | Difficulty chewing food | 24 (45.3) | 29 (54.7) | 0.583 |
| C | Preference for chewing liquid and paste-based foods | 17 (32.1) | 36 (67.9) | 0.013** |
| D | Discomfort or insecurity when feeding | 22 (41.5) | 31 (58.5) | 0.271 |
| E | Difficulty swallowing food | 19 (35.8) | 34 (64.2) | 0.053 |
| F | Food escapes from mouth during chewing | 8 (15.1) | 45 (84.9) | <0.001** |
| G | Pain or burning during chewing | 7 (13.2) | 46 (86.8) | <0.001** |
| H | Heartburn after swallowing food | 12 (22.6) | 41 (77.4) | <0.001** |
| I | Previous occurrence of oral trauma | 3 (5.7) | 50 (94.3) | <0.001** |
| J | Perception of food taste | 51 (96.2) | 2 (3.8) | <0.001** |
| K | Food temperature recognition | 53 (100) | 0 (0) | <0.001** |
| L | Oral hygiene performed by individual | 53 (100) | 0 (0) | <0.001** |
| M | Habit of breaking food with hands | 13 (24.5) | 40 (75.5) | <0.001** |
| N | Feeling tired when chewing food | 8 (15.1) | 45 (84.9) | <0.001** |
| O | Currently undergoing prolonged medical treatment | 49 (92.5) | 4 (7.5) | <0.001** |
| P | Food remains in the mouth after eating | 17 (32.1) | 36 (67.9) | 0.005** |
| Q | Bite tongue or cheek when chewing | 18 (34.0) | 35 (66.0) | <0.001** |
| R | Recent dentist appointment | 19 (35.8) | 34 (64.2) | 0.053 |
| S | Occurrence of food comes out of nose when swallowing | 1 (1.9) | 52 (98.1) | <0.001** |

*Base percentage: older adults aged between 60 and 90 years; **$p$<0.05 (binomial test).

**Table 3.** Percentage of responses in the implementation of the Clinical Assessment of Chewing Scale (N= 53). Niterói, Rio de Janeiro, 2016.

| Domains | Items | Description | n (%)* Yes | No | p-value |
|---|---|---|---|---|---|
| Dental | AA | Presence of 20 natural/implanted intact and functional teeth in the mouth | 16 (30.2) | 37 (69.8) | 0.013** |
| | AB | Use of well-fitted dentures in edentulous areas | 15 (28.3) | 38 (71.7) | 0.002** |
| | AC | Occlusal aspect functioning harmoniously | 22 (41.5) | 31 (58.5) | 0.272 |
| | AD | Presence of impairing tooth-wear | 10 (18.9) | 43 (81.1) | <0.001** |
| | AE | Presence of tooth mobility | 5 (9.4) | 48 (90.6) | <0.001** |
| | AF | High level of impairment due to dental caries | 12 (22.6) | 41 (77.4) | <0.001** |
| Soft Tissues | BA | Presence of lesions in the buccal region | 4 (7.5) | 49 (92.5) | <0.001** |
| | BB | Presence of intraoral or extraoral area of edema | 2 (3.8) | 51 (96.2) | <0.001** |
| | BC | Presence of intraoral or extraoral bleeding | 4 (7.5) | 49 (92.5) | <0.001** |
| | BD | Presence of cut, perforated and/or torn tissue | 0 (0) | 53 (100) | <0.001** |
| | BE | Altered tissue color | 3 (5.7) | 50 (94.3) | <0.001** |
| Saliva | CA | Presence of dry mouth tissue | 7 (13.2) | 46 (86.8) | <0.001** |
| | CB | Habit of swallowing and/or spitting saliva | 3 (5.7) | 50 (94.3) | <0.001** |
| | CC | Highly viscous-looking saliva | 5 (9.4) | 48 (90.6) | <0.001** |
| | CD | Presence of large amount of tartar | 17 (32.1) | 36 (67.9) | 0.013** |
| | EC | Presence of generalized mouth ulcers | 8 (15.1) | 45 (84.9) | <0.001** |
| Swallowing | DA | Presence of choking. coughing and throat clearing when swallowing | 24 (45.3) | 29 (54.7) | 0.583 |
| | DB | Presence of generalized irritation in posterior tissues of oral cavity | 6 (11.3) | 47 (88.7) | <0.001** |
| | DC | Presence of halitosis while talking | 17 (32.1) | 36 (67.9) | 0.013** |
| | DD | Frequent mouth breathing habit | 13 (24.5) | 40 (75.5) | <0.001** |
| | DE | Sealed lips when swallowing, blowing or sucking | 40 (75.5) | 13 (24.5) | <0.001** |
| Muscle/ Skeletal/ Articular | EA | Coordinated performance of jaw movements while chewing or speaking | 51 (96.2) | 2 (3.8) | <0.001** |
| | EB | Presence of crackling, looseness or clicking in the TMJ region | 19 (35.8) | 34 (64.2) | 0.053 |
| | EC | Some difficulty speaking | 10 (18.9) | 43 (81.1) | <0.001** |
| | ED | Soft tissue sagging in mouth | 36 (67.9) | 17 (32.1) | 0.013** |
| | EE | Absence of muscle tone in the face | 42 (79.2) | 11 (20.8) | <0.001** |
| Proprioceptive | FA | Presence of pain or burning on chewing | 11 (20.8) | 42 (79.2) | <0.001** |
| | FB | Presence of sensitivity in act of tactioceptive, stretching and flexor reflex | 53 (100) | 0 (0) | <0.001** |
| | FC | Presence of sensitivity when perceiving salty, sweet, bitter and acidic foods | 52 (98.1) | 1(1.9) | <0.001** |
| | FD | Presence of sensitivity to perception of hot and cold foods | 53 (100) | 0 (0) | <0.001** |

*Base percentage: older adults aged between 60 and 90 years; **p<0.05 (teste binomial).

The scores produced, observing the coding reversals of the items, varied in the sample from 16 to 27 points with a mean of 21.8 (±3.2) and a median of 22 points. The distribution of scores did not include any scores indicating an atypical situation. There was no statistically significant difference in the scores between men and women, whose median values were 22 points in both groups (Mann-Whitney test U=265; $p$-value=0.438). The correlation between age and clinical assessment score was irrelevant ($r_s$=0.119) and without statistical significance ($p$-value=0.397). The Cronbach's alpha coefficient observed was 0.63. Based on the Spearman coefficient, the results of both scales showed a strong correlation ($p<0.001$).

Having constructed the previously defined categories of analysis, the test perceptions were transformed into quantitative indicators, allowing the final perception of the status of the oral cavity of the older adults in relation to chewing. Table 4 shows the distribution of the results of the clinical analysis regarding the level of chewing impairment of the evaluated older adults.

After the application of the TAC-MI and considering the degree of impairment found, a referral flow was established for each patient (Figure 1).

**Table 4**. Percentage of distribution of degree of chewing impairment (N=53). Niterói, Rio de Janeiro, 2016.

| Degree of impairment | n (%)* |
|---|---|
| Very severe | 6 (11.3) |
| Severe | 10 (18.9) |
| Moderate | 14 (26.4) |
| Mild | 12 (22.6) |
| Very mild | 11 (20.8) |

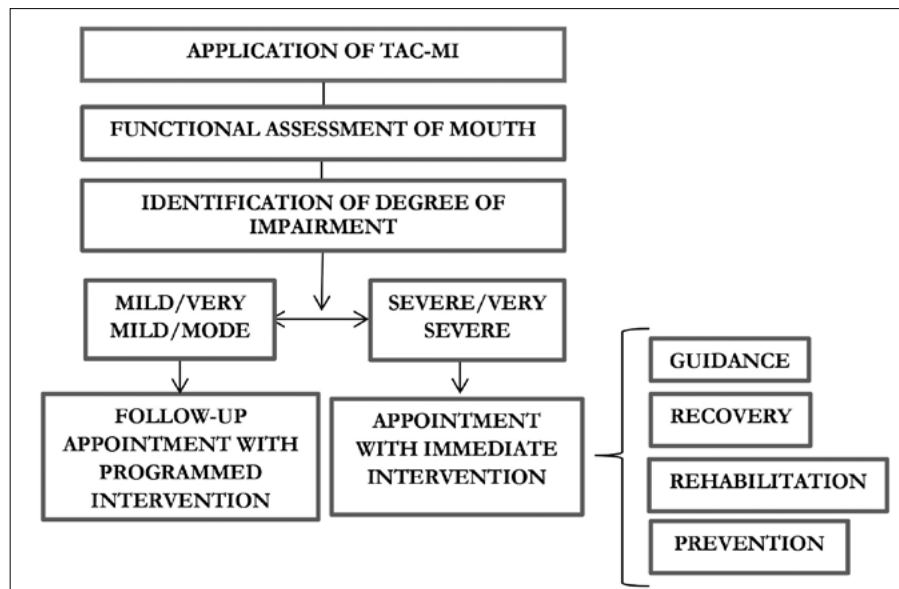*Base percentage: older adults aged between 60 and 90 years.



**Figure 1.** Flowchart of process of assessment of chewing of older adults. Niterói, Rio de Janeiro, 2016.

## DISCUSSION

Considering the difficulties, impacts and corresponding complaints reported by older patients in our daily clinical care, the aim of the present study was to assess the dissatisfaction of these patients with the proper chewing of food[2].

There was a predominance of women over men, a reflection of the permanent care women take of their health throughout life[16]. No discrepancies were found between the categories of ethnicity observed, however.

During the application of the Self-Perception of Chewing Scale, most respondents said they were satisfied with their chewing, with no preference expressed for chewing liquid or paste-based foods, and no reports of discomfort or insecurity when eating, as identified in items "A, C and D" respectively. However, when applying the Clinical Assessment of Chewing Scale, some disorders were observed, such as ill-fitting dentures, malocclusion and the lack of the minimal number of teeth required to perform proper chewing, according to items "AB, AC and AA", respectively.

The high rate of edentulism stems from the fact that, for many years, the poor oral conditions of this population group were considered a normal part of advancing age[17], something which is exacerbated over the age of 70[18]. A lack of teeth is not perceived by most as a detrimental factor for their ability to chew, with such non-perception caused by the adaptation of diet and the incorrect use of dentures, even though this condition does not allow satisfactory chewing[19].

It is often observed that the need for denture replacement only occurs due to the presence of a soft tissue injury or improper application caused by prolonged excessive use[20]. It is possible that Brazilian edentates do not have satisfactory information about the need for regular dentist consultations to evaluate and maintain their dentures[21,22].

In keeping with the findings in this study, some authors also noted the predominance of edentulism and the need for the replacement of dentures, denoting the precarious condition of the interviewed older adults, although they reported an excellent or good perception of their oral health[23,24].

Although most older adults assessed the condition of their teeth, gums and dentures as good or excellent, it was concluded that self-perception had little influence on clinical conditions, probably because acute pain is their main reference point regarding deterioration, and correlates with a favorable or non-favorable view of their chewing. This fact is easily considered a natural process of adaptation during the course of life, when restricting food choices and using inappropriate eating habits[25,26].

Another correlation observed was that most respondents did not experience difficulties in swallowing food when eating, according to item "E" of the Self-Perception of Chewing Scale. However, items "ED" and "DA" of the Clinical Assessment of Chewing Scale identified a significant percentage of respondents who experienced soft tissue sagging in the mouth and choking, coughing and clearing of the throat when swallowing.

Based on the results of the TAC–MI, it was observed that 30.2% of the sample had a very severe and severe degree of impairment when chewing. However, over time, if those with a moderate degree of impairment do not undergo dental intervention, a new, impaired, clinical situation may affect approximately 56.6% of the older adults investigated. This possibility is observed when a large number of people confirm that they have not recently sought dental treatment, more often seeking medical services to treat existing chronic diseases, as was the case in items "R" and "O" of the Self Perception Scale.

Although the increase in life expectancy of the older adult population is an important indicator of improved quality of life, the aging process is linked to physiological and structural losses, which culminate in the decline of the functional capacity and dependence of such individuals[27]. This fact becomes more worrisome when they disassociate themselves from oral healthcare, turning instead to medical services while rarely seeking dental care[28].

According to the results of instruments used and validated in other countries for assessing oral health,

questions only relate to the functional, psychological, social, pain and limitation of quality of life aspects, and are answered only through the self-perception of older adults, something which may not portray the reality of the clinical findings regarding chewing. This can include the Social Impacts of Dental Disease (SIDD); Geriatric Oral Health Assessment Index (GOHAI); Dental Impact on Daily Living (DIDL); Oral Impacts on Daily Performances (OIDP); Oral Health Impact Profile (OHIP); Oral Health-related Quality of Life (OHRQoL).

There is also a limitation on the applicability of these indices, as they sometimes only partially evaluate the tissue structures of the mouth, or the patient's subjective feelings regarding quality of life, resulting in an important gap regarding the real difficulties and conditions of chewing food and having a proper diet. Another aspect observed is the socioeconomic and cultural differences among older adults, as they have difficulties in interpreting some of the questions in these indices[29], due to inadequate technical knowledge on the subject[30].

It is important to identify the reality of the oral health of older adults, the instruments used for such assessment, and the dental factors that can directly interfere with the chewing of this population[31].

Based on existing studies that use self-perception to assess the oral health and quality of life of older adults, the findings of the present study contradict the results obtained through the assessment of the stomatognathic system[32]. Future studies should follow the clinical condition of these patients[33], since there is still a lack of effective standardization regarding the most appropriate method of understanding these characteristics[34]. The FDI World Dental Federation[35] defines oral health as multifaceted, providing various capabilities to be evaluated and compared as a group and developing a solid foundation of standard measurements.

The TAC-MI not only provides questions aimed at various aspects of self-perception, but also a structure focused on a clinical assessment performed by a professional, allowing the reality of the oral cavity to be compared and verified, and not limiting it to the patient's opinion.

When designing the test application, the emergence of several impacting changes that had gone unnoticed by older adults was identified. These are characterized as a normal part of the losses that accumulate during life, showing that the dental care service was either non-existent or had failed.

There is an evident need to use geriatric assessment tools as early auxiliary means of allowing specific screening, better decision making regarding care and arrangements linked to future planning, as well as the possibility of minimizing or eliminating the difficulties presented.

It is therefore hoped that the results of the present study represent a valid and strategic support indicator for maintaining the chewing of older adults, guiding evidence-based clinical actions.

## CONCLUSION

It is important to focus on the dental care of older adults, considering their increased life expectancy and the possible problems common to aging that may affect them, making chewing a good indicator for a successful and healthy aging.

Regarding the divergences in the information provided, it was found that a professional cannot conclude the chewing analysis process by relying exclusively on the answers provided by the older adults themselves, based on their self-perception, as this may result in the provision of inaccurate information.

Therefore, the need for a gerontological perspective aimed at the chewing of older patients is emphasized, as is the need for a professional support that ensures such patients are received by the health care service and that promotion, prevention and protection of their oral health is performed, avoiding risk situations and vulnerability to the frailty that may develop in the future.

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