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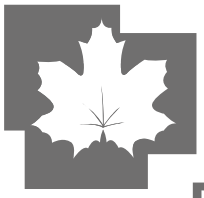

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The COVID-19 pandemic and shortcomings in management approach on a population level

The COVID-19 pandemic has required an urgent, decisive and coordinated response from governments worldwide. According to the World Health Organization (WHO), a response plan for COVID-19 should center on measures to reduce exposure of the population to the virus and curb its transmission; to manage and care for cases, particularly those who are more vulnerable to developing severe forms of the disease; to prevent overwhelming of healthcare systems; and to reduce economic and social impacts[1].

As an initial response, in the absence of a vaccine or treatment available, countries with different political contexts implemented measures for isolating confirmed cases and individuals who had close contact with infected persons, mass testing, and tracing of cases. In Brazil, the first recorded case of COVID-19 was on 26th February 2020, where this was followed by an exponential growth in the number of cases and deaths. However, the management of the pandemic has been marked by delays and failures fueled by denialism and lack of coordination among the 3 levels (Federal, State/District and Municipal) of the National Health System (SUS), having dire implications for a country of continental proportions with major inequalities.

In fact, in order for coordinated actions by public authorities to be effective, the situation peculiar to each state must be taken into account when devising tailored containment measures. A recent study[2] applied an epidemiologic model to 5 Brazilian states to investigate the consequences of lack of coordination between Federal and State levels in the devising of measures for containing COVID-19. The results showed that, in a scenario of adoption of COVID-19 containment policies that failed to take into account state peculiarities, quarantines were more lax, yet longer, and associated with higher cumulative deaths, particularly in outlier states whose characteristics differed from national norms.

Since the outset of the pandemic, the underplaying by the chief of executive leadership of the seriousness of the pandemic and the undermining of scientific recommendations has been constant. With statements undermining mask-wearing and social distancing, together with the promotion of ethically, epidemiologically and scientifically unsound measures, such as vertical isolation, Brazil´s leadership has opposed the efforts of the technical panels of the MoH and a number of governors, fostering a political discourse that proved deleterious in the management of the health crisis[3].

The lack of clear guidelines on a national level for tracing cases, coupled with difficulties in implementing strategic testing, has hampered the identification of the true number of cases in the different regions. Against this backdrop, there were planning failures in procurement of supplies, low testing of asymptomatic persons, fragmented distribution of tests and inconsistencies in compiling records of tests performed in Brazil.

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Beyond testing, in face of the thousands of SARS-CoV-2 variants worldwide, it is vital to expand the tracking of the most transmissible and severe mutations. Monitoring the way the virus is evolving is paramount for the development of accurate diagnostic tests, treatments and vaccines.

According to genomic data from the international GISAID platform (*Global Initiative on Sharing All Influenza Data;* https://www.gisaid.org/phylodynamics/brazil/), less than 0.1% of positive cases in Brazil had their genome collected and sequenced during the period spanning from February 2020 to June 2021[4]. In this respect, in 2021, a proposed action strategy for the Health Surveillance Secretariat (SVS) of the MoH was announced aimed at boosting genome surveillance of SARS-CoV-2 in Brazil[5]. A shift in the national scenario with regard to mapping the pandemic and allowing swift identification of the variants circulating in the country, and their distribution, could more effectively guide public policies.

Another example illustrating the denialist strategies comprising Brazil´s response to the pandemic is the promotion of pharmacological treatments against COVID-19 without proven efficacy, such as the use of chloroquine/hydroxychloroquine in association with Azithromycin, Ivermectin, Nitazoxanide and vitamin supplements. Although, to date, there is no solid evidence supporting the prophylactic or therapeutic use of these medications, their use was encouraged by the Brazilian government for treating the disease in its early stages. A cocktail containing different combinations of the drugs outlined above, referred to as a "Covid-Kit", was made available at government Basic Health Clinics of some Brazilian cities. To much consternation, the possibility of distributing the cocktail via pharmacies affiliated under the national Popular Pharmacy Program had also been mooted[6].

The use of drugs with unproven efficacy exacerbates the pandemic on several fronts, including the risk of serious adverse events, inherent delay in seeking medical attention, and huge waste of public money which could have been better invested. Other consequences include increased self-medicating and future emergence of antibiotic-resistant strains, particularly in the case of Azithromycin, owing to its indiscriminate use.

The treatment of COVID-19, together with its prevention and diagnosis, has driven the *infodemic* which has propagated globally throughout the pandemic. The glut of information on COVID-19, particularly false or inaccurate information, has hampered effective health communication and had a major social impact. A study conducted in England showed that a high level of conspiracy thinking about the coronavirus was associated with less adherence to government guidelines and less willingness to take diagnostic tests or be vaccinated[7].

Thus, developing evidence-based strategies to mitigate misinformation is crucial. Such strategies should center on information monitoring, building eHealth Literacy and science literacy capacity, improving the quality of information, and accurate knowledge translation[8], besides greater transparency and integrity of studies, more specifically those related to COVID-19. In Brazil, despite growing public attention to the issue, initiatives fighting the infodemic have been weak, with limitations concerning scant investment in communication, sidelining of science, and unequal access to information.

With the pandemic paradigm of the development of vaccines for COVID-19, misinformation discourse remains strong, but now vaccination has become the target. Social media networks are awash with sensationalist fake news about supposed dangers of the vaccine, ranging from false adverse effects post-vaccination to conspiracy theories over the use of vaccination to implant people with chips. These anti-scientific narratives, often supported by public authorities, erode public confidence in the efficacy and safety of vaccines.

With regard to vaccination for COVID-19, Brazil´s trajectory has also involved failures in planning ahead for purchase of vaccines, diplomatic issues, shortage of essential supplies and exacerbation of political disputes. All of these shortcomings culminated in delays in mounting the national vaccination campaign, which commenced only on 18th January 2021, while many countries had launched programs back in 2020.

Despite this slow start, Brazil has made advances in the vaccine roll-out. In the first quarter of 2021, evidence indicates an association between vaccination and a relative material decline in mortality of older adults compared to younger individuals[9].

In Israel, where the pace of vaccination has been rapid, data have been encouraging, highlighting the importance of this strategy in tackling COVID-19. The country began applying vaccines to its population in mid-December 2020 and, by 24 February, 85% of over 60s had received both shots of the Pfizer-BioNTech vaccine schedule, with a sharp drop in the number of cases and hospital admissions related to the disease[10].

Almost one and half years after the first cases and deaths due to COVID-19, around 500 cases of the delta variant have been registered in Brazil. The country has not learned from past mistakes and is ill-prepared for the looming wave of variants. We are witnessing the same "modus operandi" of the pandemic and the impact that the introduction of this "new" variant is having on the Epidemiology of the disease which, by all accounts, appeared to be largely under control in many countries able to contain the number of cases and deaths in 2020. The lessons seem clear, yet the way we are learning them appears to be in stark contrast with what is truly required to combat this "new Spanish flu".

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The meaning of circular dance in the imagination of older people

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Abstract

Objective: To understand the meaning of circular dance in the imagination of older people in their daily lives. *Method*: interpretative study, qualitative in nature, based on Michel Maffesoli's Comprehensive and Everyday Sociology. Data were collected through interviews and participant observation, with 17 older women practicing circular dance in *Rodas* (circular dance groups) in the Primary Health Units of Southern Brazil. Data were analyzed using the Shatzman and Strauss analysis precepts, bringing out two thematic categories: Attributing meaning to circular dance and feeling through circular dance. *Results:* Participants point out that circular dance, in the older person's imagination, is inclusive and welcoming, favoring the feeling of belonging and unity among everyone, without losing their individuality and that of the other who shares. To participate in the dance, it is necessary to be centered on oneself, in the moment, seeking not to stray from the vivid moment. *Final considerations:* circular dance as an expression of everyday life is a space for exchange, presence, play, collective living linked by emotional ties and affection that strengthens ties and positively resignifies living.

Keywords: Health of the Elderly. Dance. Health Promotion. Activities of Daily Living.

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INTRODUCTION

Circular Dance (CD) is a traditional and contemporary dance practice performed in a circle, originating from the folklore tradition of different cultures. They are dances done in a circle with the purpose of dancing together, favoring learning and harmonious interconnection between participants who begin to internalize the movements, freeing the mind, heart, body and spirit. Through the rhythm, melody and delicate or vigorous movements, the members of the circle are encouraged to respect, accept and honor diversities[1,2].

For the practice of CD it is not necessary previous experience, nor specific skills to develop the movements. The circles are guided by a focuser, who is a member of the group who passes on the choreography of each dance, its history, music, intentions and symbols to the others[3,4].

The participation of older people in CD groups is an alternative to promote the improvement of their quality of life. Through this dance, there is a union between people, the movement of the circle and the hands that encourage the expression of feelings of trust, equality, mutual support, making each one understand their importance in time and space[5].

Recently, CD was integrated into the offer of Integrative and Complementary Practices in Health (PICS), through Ordinance No. 849/2017, which expands the procedures offered in the Unified Health System (SUS)[2]. This fact reiterates the therapeutic resource of this activity and enables the construction of a new paradigm in the context of public health in the country.

Integrative and complementary therapies emerge as a reinforcement of the assumption of comprehensiveness in health care, viewing the user in a holistic way, differentiating themselves from conventional therapies that place greater emphasis on the biomedical, curative and disease-centered model[6].

The implementation of PICs is in line with SUS principles, such as integrality, universality and equity. It can be considered an important strategy for the construction of a care model that encourages and seeks humanized ways of relating, with respect to the singularities and subjectivities of the subjects[7].

The National Health Promotion Policy (PNaPS) points out as one of its objectives the need to value traditional knowledge and integrative and complementary practices, recognizing these actions as important for the population's Health Promotion[8].

CD can be considered a practice that contributes to the field of action of Health Promotion. This activity is articulated with the five fields described in the Ottawa Charter: the creation of favorable environments, the development of personal skills, the reinforcement of community action, the reorientation of health services and the creation of healthy public policies[9].

The practice of CD is open to all ages, however, in the daily life of health services, there is a greater demand for older people. The demographic and epidemiological transition process contributes to older people being perceived as the population group that most frequents the Health Centers. However, much of the care offered to this population is carried out in the logic of the biomedical model of care, centered on a curative proposal, which focuses on the disease and not the human being, clashing with the Health Promotion proposal[10].

The benefits of dancing in old age indicate that dancing is a physical activity positively associated with improving the health and quality of life of older people, showing benefits in physical, social and emotional aspects[11]. Among the Health Promotion activities that have been developed for older people in the SUS, it is relevant to know about the meanings and the imaginary of CD practice and how the realization of this activity affects the daily lives of older people. Everyday life is understood as the way of living of human beings that reveals itself in the interactions, beliefs, values, meanings, symbols and images that design their process of living, in a movement of being healthy and getting sick, punctuating their life cycle[12].

It is in everyday life that images and symbols are presented, integrating the imagination. In this study, the imaginary is understood as a world of meanings,

ideas, fantasies, evocation of figures already perceived or not perceived, beliefs, values, in which the human being is immersed. Anyway, the imaginary is a world of meanings, which are incorporated into images[13].

The aim is to understand the meaning of CD in the imagination of older people in their daily lives, as well as to propose new possibilities of care, in the perspective of improving the quality of life of aging people, collaborating with the Health Promotion of this population.

METHOD

This is an interpretive study of a qualitative nature, based on Comprehensive and Everyday Sociology, bringing the notions and Theoretical Assumptions of Sensitivity (criticism of schematic dualism, form, relativistic sensitivity, stylistic research, libertarian thinking) proposed by Michel Maffesoli. The possibility that this framework provides for the understanding of human experience involves meanings, symbols, images and the imaginary, as well as sensitive reason[12].

The study was carried out in three Basic Health Units (UBS) in a city in southern Brazil, selecting a sample size of respondents capable of meeting the understanding of the object of study. The choice of Units was made intentionally, being selected those that offered CD Circles to the population, considering these health centers as an inclusion criterion. This study included 17 older people who practiced CD regularly, at least once a week, for at least three months.

It is noteworthy that all people aged 60 years or over, practitioners of CD, in the studied setting, were invited and voluntarily accepted to take part in the research. Through in-depth interviews and participant observation, data collection took place from September 2016 to March 2017, at a time and place scheduled according to the preference of each participant. The interviews were digitally recorded and later transcribed and had an average duration of 50 minutes, being guided by guiding questions about the participants' daily lives, the meaning of CD and aspects related to their health.

Participant observation was used as a complement to the interviews, following a script that included elements to be observed such as the number of participants, the interaction between them, as well as the verbal and non-verbal reactions after each dance. In total, 10 observation sessions were carried out, on alternate days, in the three Circles, with an average duration of 1 hour and 40 minutes each. A Field Diary involving Interaction Notes, Methodological Notes, Theoretical Notes and Reflective Notes was used to record the information.

As a method of data analysis, the model suggested by Shatzman and Strauss was used: preliminary analysis, ordering, key links, coding and categorization[14]. Through readings and re-readings of the texts generated from the transcripts of the interviews and observations, the significant speeches that gave rise to the initial codification process were highlighted. As a follow-up, the coding process was debugged, through the identification of classes and their connections, which guided the elaboration of the thematic categories.

The study was approved by the Ethics Committee for Research with Human Beings under nº. 1,744,314, and complied with the ethical principles provided for in Resolution n. 466/12 of the National Health Council[15]. Data were only collected with the consent of the participants by signing the Informed Consent Term, after reading and explanation.

To guarantee the anonymity of the participants, their names were replaced by the following codenames, in the case of the older people: Inspiration, Confidence, Purpose, Fun, Strength, Delivery, Contentment, Spontaneity, Balance, Kindness, Beauty, Faith, Transformation, Simplicity, Support, Forgiveness and Celebration.

RESULTS

Participants were aged between 64 and 82 years, with an average of 65 years with 16 women and one man. Regarding education, nine had incomplete elementary education; three, Complete Elementary School; three, High School; and two, Higher Education. With regard to marital status, 13 participants were married and four were widows, all

of whom reported having children, whose number ranged between two and 14, with an average of 4.6. Considering the occupation, eight called themselves housewives, eight were retired and one was an artisan.

The meaning of CD in older people's imagination is revealed in two categories presented below: Attributing Meaning to CD and Feeling through CD.

Atributing Meaning to Circular Dance

Older people, when experiencing dancing hand in hand in a circle, symbolize the union between the participants and the equal position that the center gives them. In this regard, they highlighted the perception that CD is for everyone, without distinction, a movement that favors coexistence with diversity and differences.

> "At CD I see the union between people. We are all the same there, there are no rich people, there are no poor people. I see everyone treating each other very well, especially the teachers, who pay a lot of attention, this is often what older people need." (Strength).

It can be seen that the inclusive and welcoming character that CD provides comes from the speeches. It emerges from the meanings that the presence of the other is essential to guarantee the feeling of belonging to the group.

> "Besides dancing, I really like people, being among people, participating in groups" (Fun).

> "It seems that we gathered the same group of souls" (Balance).

> "I like being with more people, I don't like loneliness, being alone at home" (Beauty).

CD is a different physical activity for providing greater interaction between people, rescuing the wanting to do and not having to do.

> "I needed to exercise, but I didn't want to do gymnastics. Dancing is more enjoyable, there are friendships, we dance, we laugh, we play" (Strength).

> "In gym I come because I need to. In dance, I come because I like it! I love to dance! Spending time, talking, being in a group, laughing, playing games" (Kindness).

In the practice of CD, older people were able to experience a time of possibilities to learn new things, acceptance of mistakes and physical limitations, as well as the need to adapt. As in CD performance is not required, the emphasis is not on technique but on the challenge of each one to give their best. The new is seen as something possible, and the possible can be enough.

> "Dancing is new, as I have never danced in my life. I know I'm not going to be a dancer, but I think I'm doing fine. This brings something new to life, as I've never been a dancer, for me it's been a challenge, so what I'm already doing is good in size" (Faith).

Participants related the experiences lived and shared with aspects of life that are redefined by dance and by being together, which encourages self-esteem and confidence to face new challenges.

> "This phrase that is always said at the Circle, The dance is like our life, even if we make mistakes, we cannot stop, left a mark on me. That to me is the meaning of dance. Even if you make a mistake, don't stop, because life is like that. We stumble, make mistakes, but let's go ahead. Raise your head and keep going" (Contentment).

By expressing in words the images they had of CD, the older people returned to the collective character, demonstrating how this practice enables integration and socialization among people. It is noticed that the participants, when they are dancing, distance themselves from daily concerns, experience being together in a perspective of welcoming and wholeness.

> "What comes to my mind is unity. As I'm going to tell you, it's a dance that brings people together" (Forgiveness).

> "The group! Everyone is together trying to forget the problems of everyday life, at least here you can forget if you have any problems" (Faith).

> "I think about the hug, when we hug in the circle at the end, it's really good!" (Support).

CD enables the strengthening of social ties, as well as reducing the feeling of loneliness and isolation that affects many older people. Older people reported that if they were not in CD, they would probably be at home, alone or with no one to talk to.

> "I'm very lonely, the three of us live together (husband and son), but there's no one to talk to, to say anything. So in the dance I made other friends. I started to interact better with other people" (Contentment).

Feeling through the circular dance

Through CD, the older person experiences dancing together, being and belonging to a group, without, however, ceasing to be unique. Perceive their individuality and that of the other who shares that moment. To learn the dance steps, you need to be centered on yourself, directing your attention to the moment you are experiencing, seeking strategies to deal with dispersal factors.

> "I try to stay, I don't know if you notice, I stay very focused to learn the steps. There are some who talk more, but it's their way and we have to respect, each one is one. But I like to stay focused to learn, I like to learn. I feel good when I learn, when I'm following it" (Confidence).

Each participant describes the experience of dancing in a very particular way, according to their perceptions and feelings. For some, the fact of holding hands refers to a feeling of security, as reported by this older woman, who in her daily life used crutches to walk around. Holding hands in the circle made it possible for her to feel safe to dance, being supported and supporting the group.

> "At first I was upset about having to walk on crutches, which is boring. But now I don't care anymore. You have to think that it's for help and crutches are charming. The doctor already said I can't go without them, a fall for me, God forbid! It can be the end of life in a wheelchair. In dancing, holding hands, I feel safe. At the time of the circle I have no difficulty" (Purpose).

Others highlighted the pleasure, happiness, peace and other feelings of well-being that the activity provided them.

> "I feel really good when I'm dancing, I feel very comfortable. It's good for the physique, I'll tell you it is. It's more for the pleasure of dancing, because I like it. It's this pleasure that it gives me" (Fun).

> "Every time we come to dance, let's say it's another drop of optimism planted in our hearts" (Contentment).

> "I feel happy. Despite getting a little wrong. But I don't see mistakes as a problem, I feel good" (Balance).

Thus, the older people brought from their imagination, from the experience of dancing together, that CD as part of daily life, is a space of exchange, of belonging, of collective living linked by emotional ties and affection.

DISCUSSION

This study made it possible to understand CD in the daily lives of older people, being relevant to promote the improvement of their quality of life. CD allows inclusion, the feeling of belonging and closeness among peers, preserving their individuality.

The data found in the category "Attributing Meaning to Circular Dance" are in line with the results of a study that investigated the psychological and emotional factors of older practitioners of ballroom dancing. Dance practice provides a rich context of social interactions and positive experiences[16].

Through this integrative practice, the experience of returning to the archaic occurs in the midst of a society marked by technology and scientific knowledge, characteristic of Post-Modernity, since it sends participants to tribal dances. It favors the transfiguration from the "I" era to the "we" era, as it is through the gaze of the other that I recognize myself and make myself exist[17].

Postmodern thought proposes the decline of individualism, so that the human being cannot be analyzed individually. Each person plays a role within a tribe. Tribalism brings the importance of the feeling of belonging to a place, to a group, as an essential foundation of all social life. Contemporary society is made up of several tribes, which are characterized by fluidity, occasional gatherings and dispersion. Tribalism is a cultural phenomenon, "a true spiritual revolution, a revolution of feelings that highlights the joy of primitive life, of native life", in which urban tribes reveal the urgency of an empathic sociality where emotions are shared, affections are shared[18]. This is how we understand each Circle as a tribe, the Tribe(s) of the circular dance.

At the same time that the emphasis on the future gives way to the importance of the here and now, living in the present mobilizes societal energy, the moment is eternalized, becoming a privileged place for the pleasure of being[19].

The CD circles were described by research participants as an environment where people make themselves present with each other, in a playful and festive way, unite by bonds of affection and worship the ethics of aesthetics, which is this wanting to be together with, cement, the social link, experimenting together as a socialization factor[18]. Corroborating these results, other studies have identified that empathy, solidarity and welcoming permeate group relationships, providing a bond and a feeling of belonging among the participants[19,20].

Human beings have always sought strategies to express their feelings and emotions, and dance, in general, represents one of them. CD, by proclaiming simplicity of rhythm and execution, can be worked in groups, forming a circle where participants dance together, seeking integration in the circle through singing, rhythm and execution, in order to promote balance, physical, mental and social well-being[21,22].

CD can be considered a socialization factor that unites those who see in dance a possibility of building encounters and relationships, which through rhythm, music and movements are brought into harmony with the circle and with the ancestry of each dance[23]. In the CD circle, "form" is present at all times, being formant, but not formal, making it possible to see the contours from within, learning about the space of the other and our space. Diversities and differences gave shape to the dance, without any formality, favoring welcoming, supporting and living together. In this perspective, a methodological resource that relies on form is entirely relevant, if one intends to account for a society that is increasingly structured in the image[14].

Dancing in circles triggers a new ethics in life that allows the redefinition of behaviors and postures for the encounter with yourself and with the other.

In the category "Feeling through Circular Dance", the practice of CD proposes the collective experience of dancing together that recognizes and lives with diversities[24]. In the circle, formed by holding hands, no one has a prominent place, giving the participants the feeling of being included in the whole. Since all points on a circle are return points, traversing the circle rotates 360 degrees without losing the relationship with the center, and each point has the same distance from the center[7]. Thus, symbolically it shares a space of belonging, cooperation, security, solidarity and unity.

Through CD, health care can be interconnected with health promotion practices. Activities seen not as exclusively for the prescription of healthy styles, but as the creation of possibilities that can contribute to the emancipation of individuals, groups, communities and health workers and transform life behavior[25].

Affective bonds built in a convivial and learning environment contribute to the participants' perception of becoming happier and more active people[26]. The opportunity to be together makes it possible to alleviate isolation and loneliness, one of the most serious problems of the older population, leading them to (re)create the feeling of belonging to a group, to a community, reborn to socio-community life[27].

Maintaining social relationships is important for a healthy life, reducing social isolation and improving self-perception. Participation in groups encourages older people to remain active in carrying out activities that contribute to their empowerment by valuing their individuality and autonomy. It is in this context that the individual's interaction is observed, thus enabling greater inclusion in the group, as in circular dance, giving voice to the older person.

In CD, the relationships of the participants are horizontal, giving a significant collective and personal character, in which positive aspects are experienced, making the subject more resilient in coping with the health-disease process[7].

Thus, in addition to expanding motor and postural capacity, CD recreates the possibility for the reorganization of both internal and external balance, expressing the gestures of life, translating dreams and exercising feelings and imagination[23]. In addition, caring for the body, with aesthetics stimulates the development of self-esteem[5]. Working on beauty in old age means health and self-care and care for the body, with the image[27].

Another aspect that was revealed from the data refers to the biopsychosocial benefits generated by dance in the lives of older people, it was found that dance, when practiced by older people, generates sensations and feelings of well-being that contribute to improving the quality of life of older people, as well as the promotion of a healthier life. Thus, it is proposed that opportunities for the practice of dance, for this age group, be more offered by public health agencies[28], highlighting their inclusion in UBS that develop integrative and complementary practices[2].

CD provides participants with the awakening of body awareness. The perception of meanings and satisfaction with the involvement of dance promotes well-being among individuals, brings physical, social and emotional benefits, with improved relaxation, pleasure and mood control, making them healthier[17]. CD, an activity that inspires and motivates the expression of feelings, enables the rediscovery of the internal rhythm of Western man, so that he can organize and understand the world, reality and his own being, in constant transformation[24].

Post-Modernity asks for other human qualities, facing adversity with openness to diversity, complexity to understand and simplicity to act, collaboration and sharing, in which the consideration of affections, the emotional, the passions allows integrating the forces of the imagination into the holistic understanding that you can have from being together[18,29].

In Michel Maffesoli's perspective, the imaginary goes beyond the individual, it is nurtured by the collective, being a set of rational and non-rational mental constructions of impulses for action, a reservoir of feelings, emotions, values, affection, symbols and images[12].

As limitations of the study, it is clear that the local nature of CD performance limits the data found, suggesting its expansion to other spaces, involving the everyday, the imaginary and its articulation with other PICs as health promotion practices.

CONCLUSION

Circular Dance, in the older person's imagination, enhances being together, has a welcoming and inclusive character that favors the feeling of belonging. Older people who dance exercise attention, memory, cognition, expression, in addition to socialization, community belonging and reduction of social isolation. The main contribution of this study is to enable researchers and health professionals to take ownership of this integrative and complementary practice and encourage its realization in other spaces.

Feeling together was present, where feelings of happiness, peace, contentment, optimism and pleasure were outlining the redefinition of the lives of older people, making them more resilient to daily adversities and directed towards a healthier life.

Anchored in Michel Maffesoli's Comprehensive Sociology, Nursing can understand the human being in a holistic way, considering non-measurable aspects, such as meanings and feelings, the imagination itself, in care actions. Understanding the meaning of CD in the imagination of the older person in their daily life showed that this activity can be articulated with sensitive reason, integrates the symbolic and the imaginary, and contributes as an expression of life, being a space for exchanges.

Therefore, CD can be used by Nurses and other health professionals as another resource available for the care of the older population with a view to Health Promotion. Finally, it is suggested that the practice of CD be encouraged by health professionals in daily life.

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Prevalence of depressive symptoms and associated factors in older people from Primary Health Care Units in Rio Branco, Acre

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Abstract

Objective: To estimate the prevalence of depressive symptoms and associated factors in older people from Primary Health Care units in Rio Branco, Acre, Brazil. *Method:* This was a cross-sectional study conducted with older people registered in Primary Health Care units in Rio Branco, Acre, between 2016 and 2017. The prevalence of depressive symptoms was measured using the *Geriatric Depression Scale* (GDS-15), and associations were tested with selected variables. Crude and adjusted prevalence ratios were calculated with a 95% confidence interval by Poisson regression with robust variance. *Results:* The prevalence of depressive symptoms was 74.5%. The most strongly associated factors were perception of insecurity in the place of residence (PR=1.46; 95% CI 1.23-1.74), family income lower than the minimum wage (PR=1.10; 95% CI 1, 01-1.20), and unsatisfactory self-perception of health (PR=1.25; 95% CI 1.14-1.37), adjusted for gender, age, education, work activity, and frailty. *Conclusion:* There was a high prevalence of depressive symptoms in the studied population. The identification of associated factors pointed to the socioeconomic and health vulnerability in which older people are in, relating to the conditions associated with depressive symptoms.

Keywords: Depressive Symptoms. Health of the Elderly. Epidemiology. Cross-Sectional Studies.

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INTRODUCTION

Population aging is a phenomenon observed worldwide. Regarding health, the demographic transition along with the epidemiological transition represents a change in the profile of the population diseases toward a greater number of long-term diseases and severities. This change has been influenced by several factors, including advanced age, vulnerability to pathological processes, and frequently associated injuries. Among the most common morbidities in older people are cardiovascular diseases, arterial hypertension, diabetes, and psychiatric disorders, with dementias and depression emphasized among these[1].

In Brazil and several countries, the frequency of mental disorders has been increasing, which in turn has caused negative functional, mental, and social changes in affected individuals. According to the World Health Organization (WHO), it is estimated that 12.0% of the world's population suffers from some type of mental disorder and that in Brazil, this proportion is 6.0%, with depression being the most frequent disorder in population[2]. Unlike in young adults, depression in older people is mainly manifested by cognitive changes and somatic symptoms such as loss of interest in usual activities, fatigue, sleep disorders, cognitive and memory problems, thoughts about death, and hopelessness[3].

It is at the community level that the largest part of the older population is found and that treatment for this population is generally carried out within the scope of Primary Health Care (PHC). Thus, it is of great value that health units are prepared to act encompassing health promotion, protection, and prevention, as well as knowledge of the main health factors and problems affecting the population in the areas covered[4]. The main risk factors for depressive symptoms in older people are chronic diseases[5], being female[5], the presence of frailty[6], having low control in daily activities and life[7], being socially and economically vulnerable, having a functional disability, and having health problems perceived as stressful[8].

When considering the regional, cultural, and social differences observed in older Brazilian people, greater knowledge on depressive symptoms in older people in the North region is needed, as it has visible socioeconomic inequalities, limited care coverage, access difficulties, and low health indicators, making it one of the least developed regions in the country. Therefore, the present study sought to estimate the prevalence of depressive symptoms and associated factors in older people assisted by two PHC units in Rio Branco, Acre, Brazil.

METHODS

The present study is part of a matrix survey called *Frailty and health conditions of older people* carried out between October 2016 and June 2017 in Rio Branco (AC). The municipality of Rio Branco has a territorial extension of 8,835,541 km² and a population of 336,038 inhabitants, of which 23,299 (6.9%) are aged 60 years old and over[10]. Regarding the number of PHC units, the aforementioned capital of Acre had 11 Reference Units in Primary Health Care (URAP) and 43 Family Healthcare Units (USF) until 2020.

This is a cross-sectional study of a representative sample of older people registered in a URAP and a USF located in two different healthcare regions of the city[11]. The sampling process was carried out in two stages. In the first stage, the two PHC units with the largest number of registered older people and with updated family registration in the city of Rio Branco (AC) were used as sampling units. In the second stage, the drawing of older people was defined to obtain a representative sample from each health unit. The calculation of the sample size considered the estimated prevalence of frailty of 10%, sampling error of 3%, a confidence level of 95%, plus 20% for possible losses, thus resulting in an estimated sample of 365 older people.

The inclusion criteria were being aged 60 years old and over, living in the coverage area, and having registration in the selected health unit. Institutionalized older people and those with a health situation that made it impossible to answer the survey questionnaire were excluded. The older people who refused to respond to the survey, those who were not found at home after two visits, those who had moved to another area, and those whose interviews did not have all the necessary elements

for the outcome of the matrix study or the elements necessary to classify depressive symptoms for the current study were considered losses.

Data were collected at the older person's home by previously trained interviewers. The data collection instrument used was based on the questionnaire validated in the EPIFLORIPA study[12].

The outcome variable of this study was "depressive symptoms" obtained by applying the Brazilian version of the *Geriatric Depression Scale* (GDS) with 15 items[13]. The cutoff point used was five/six (categorized as 'No depressive symptoms/ With depressive symptoms').

The independent variables studied were gender, age group (60-79 years old; 80 years old and over); skin color/ethnicity; marital status; education (attended school: yes/no); household arrangements; individual income; work activity (currently working: yes/no); type of income (retirement; pension; benefits or others); family income (>1 MW; <1 MW); perception of security in the place of residence (satisfactory/unsatisfactory); body mass index; smoking habit; practice of physical activity assessed using the *International Physical Activity Questionnaire*[14]; self-perceived health (satisfactory [very good/good]; unsatisfactory [regular/bad/very bad]); cognitive deficit assessed using the Mini-Mental State Examination[15] considering the level of education; frailty assessed using the *Edmonton Frail Scale (EFS)*[16] (no [not frail and apparently; medicle]; yes [mild, moderate and severe frailty); functional disability assessed using the scale of basic and instrumental activities of daily living[17]; nutritional risk; fall history; use of medications; polypharmacy; suffered violence at some point in life; health insurance. The morbidities reported by the older people were evaluated: rheumatic diseases (spine or back disease, rheumatism, arthritis and/or arthrosis), cancer, diabetes, osteoporosis, cardiovascular disease, chronic kidney failure, tuberculosis, cirrhosis, stroke, and high blood pressure.

The association between depressive symptoms and independent variables was estimated using Poisson regression with robust variance, which is an adequate model for evaluating a dichotomous outcome with a prevalence greater than 10%.

The inclusion of variables in the multivariate model considered the following criteria: *p*-value ≤0.20 in the bivariate analysis, higher prevalence ratio, and biological plausibility. The permanence of the variables in the adjusted analysis was determined by the *p*-value ≤0.05. Data were weighted, and all analyses took into account the sample weights. After applying the weighting factor, the older people selected represented all the older people registered in the two healthcare regions. For the fit model analysis and the residual analysis, the parameters used were *deviance*, *Akaike information criterion* (AIC), and *Bayesian information criterion* (BIC).

The study safeguarded all the ethical aspects provided for Resolution No. 466/12 of the Conselho Nacional de Saúde (the Brazilian National Health Council) of the Ministry of Health. The research was submitted and approved by the Research Ethics Committee of Escola Nacional de Saúde Pública Sergio Arouca (ENSP/FIOCRUZ) under number 58791716.5.0000.5240.

RESULTS

The studied sample comprised 284 older people representing 900 older people after applying the sample correction factor. Of the 298 individuals initially in the study universe, 14 were considered losses due to missing data for the classification of the outcome.

The sample comprised mainly women (61.6%) aged between 60-98 years with an average of 71.0 years (±8.5). Most respondents declared to be nonwhite (84.2%), married (48.1%), attended school (58.4%), had an average of 2.9 years of education, lived with family members (58.6%), and were from other cities in the state of Acre (55.3%). Regarding labor activity, 81.2% did not work, 92.1% had individual income from retirement (69.0%), with a monthly family income below the minimum wage (71.8%). There was a predominance of unsatisfactory perceptions regarding safety in the neighborhood where they lived (87.4%), they did not have health insurance (84.0%), and they reported having already suffered some type of violence (60.4%) (Table 1).

Regarding the variables related to the lifestyle of the sample, the largest proportion of older people had an adequate body mass index (BMI) (44.7%), had a smoking habit (69.4%), and reported not practicing any physical activity at least three times a week (76.6%) (Table 2).

Table 1. Bivariate analysis of depressive symptoms in older people in health care units according to socioeconomic variables, Rio Branco, Acre, 2016-2017.

Variables	N 284	NExp 900 (%)	Depressive symptoms		Gross PR (95%CI)	*P*-value
			No n 230 (25.5)	Yes n 670 (74.5)		
Gender						
Male	111	345 (38.4)	110 (48.0)	235 (35.1)	1	0.001
Female	173	555 (61.6)	119 (52.0)	435 (64.9)	1.15 (1.06 – 1.25)	
Age group (years)						
60-79	237	746 (83.0)	210 (81.7)	536 (80.0)	1	<0.001
80 or more	47	153 (17.0)	19 (8.3)	134 (20.0)	1.21 (1.13 – 1.30)	
Skin Color/Ethnicity						
White	45	142 (15.8)	28 (12.2)	114 (17.0)	1	0.039
Not white	239	758 (84.2)	202 (87.8)	556 (83.0)	0.91 (0.84 – 1.00)	
Marital status*						
Married	141	437 (48.8)	116 (50.7)	321 (48.1)	1	
Single	28	87 (9.7)	33 (14.4)	54 (8.1)	0.85 (0.72 – 0.99)	0.045
Divorced/separated	42	133 (14.8)	36 (15.7)	97 (14.5)	0.99 (0.89 – 1.11)	0.915
Widow/er	72	239 (26.7)	44 (19.2)	195 (29.2)	1.10 (1.02 – 1.19)	0.013
Education						
Attended school	167	526 (58.4)	163 (70.9)	363 (54.2)	1	
Did not attend school	117	374 (41.6)	67 (29.1)	307 (45.8)	1.19 (1.11 – 1.27)	<0.001
Household arrangements						
Lives with spouse	40	129 (14.3)	42 (18.3)	87 (13.0)	1	
Lives with family**	150	487 (54.1)	94 (40.9)	393 (58.6)	1.19 (1.05 – 1.34)	0.005
Lives with spouse and family	47	144 (16.0)	53 (23.0)	91 (13.6)	0.94 (0.80 – 1.10)	0.472
Does not live with family***	18	51 (5.7)	14 (6.1)	37 (5.5)	1.08 (0.93 – 1.31)	0.420
Lives alone	29	90 (10.0)	42 (18.3)	63 (9.4)	1.02 (0.86 – 1.22)	0.790
Individual income*						
Yes	261	830 (92.1)	216 (93.9)	614 (91.5)	1	
No	23	71 (7.9)	14 (6.1)	57 (8.5)	1.08 (0.97 – 1.22)	0.157
Work activity*						
Yes	48	159 (18.8)	69 (31.2)	90 (14.4)	1	
No	220	685 (81.2)	152 (68.8)	533 (85.6)	1.37 (1.20 – 1.57)	<0.001
Type of Income						
Retirement*						
Yes	185	593 (69.0)	141 (63.8)	452 (70.8)		
No	86	266 (31.0)	80 (36.2)	186 (29.2)	0.92 (0.85 – 1.00)	0.057

to be continued

Continuation of Table 1

Variables	N 284	NExp 900 (%)	Depressive symptoms		Gross PR (95%CI)	*P*-value
			No n 230 (25.5)	Yes n 670 (74.5)		
Pension*						
Yes	55	46 (19.5)	33 (14.9)	132 (21.2)	1	
No	213	680 (80.5)	188 (85.1)	492 (78.8)	0.90 (0.83 – 0.98)	0.020
Benefits or others						
Yes	40	125 (14.8)	25 (11.3)	100 (16.1)	1	
No	228	719 (85.2)	196 (88.7)	523 (83.9)	0.91 (0.83 – 0.99)	0.043
Family Income#						
>1 MW	76	253 (28.1)	79 (34.5)	174 (26.0)	1	
≤1 MW	208	646 (71.9)	150 (65.5)	496 (74.0)	1.10 (1.01 – 1.21)	0.009
Perception of security in the place of residence*						
Satisfactory	29	113 (12.6)	49 (21.4)	64 (9.6)	1	
Unsatisfactory	254	784 (87.4)	180 (78.6)	604 (90.4)	1.34 (1.15 – 1.57)	<0.001
Health Insurance						
No	238	745 (84.0)	175 (80.6)	570 (85.1)	1	
Yes	44	142 (16.0)	42 (19.4)	100 (14.9)	0.93 (0.83 – 1.03)	0.173
Suffered violence						
No	130	425 (49.6)	117 (56.7)	308 (48.2)	1	
Yes	144	432 (60.4)	101 (46.3)	331 (51.8)	1.05 (0.98 -1.14)	0.160

*Differences in absolute frequency values correspond to losses or not applicable, **Family members: Children, grandchildren; ***Family arrangement with a person of the same generation as the older person and/or with friends/daughters-in-law/sons-in-law, among others; #MW= minimum wage; NExp= N expanded from the weights and sample design; %= proportion from NExp; PR: Prevalence Ratio.

Table 2. Bivariate analysis of depressive symptoms in older people in health care units according to lifestyle variables, Rio Branco, Acre, 2016-2017.

Variables	N 284	NExp 900	Depressive symptoms		Gross PR (95%CI)	*P*-value
			No n 230 (25.5)	Yes n 670 (74.5)		
Body mass index*						
Proper weight	105	339 (44.7)	81 (43.3)	258 (45.2)	1	
Low weight	42	123 (16.2)	32 (17.1)	91 (15.9)	0.96 (0.86 – 1.08)	0.537
Excess weight	33	94 (12.4)	22 (11.8)	72 (12.6)	1.01 (0.89 – 1.13)	0.909
Obese	68	202 (16.6)	52 (27.8)	150 (26.3)	0.97 (0.89 – 1.07)	0.594
Smoking habit						
No	92	275 (30.6)	86 (37.4)	189 (28.2)	1	0.016
Yes	192	625 (69.4)	144 (62.6)	481 (71.8)	1.11 (1.02 – 1.21)	
Physical activity practice*						
Yes	64	205 (23.4)	138 (61.1)	113 (17.5)	1	<0.001
No	215	672 (76.6)	88 (38.9)	534 (82.5)	1.42(1.26 – 1.61)	

NExp = N expanded from the weights and the sample design; % = proportion from NExp; PR: Prevalence Ratio; *Differences in absolute frequency values correspond to losses or are not applicable.

Regarding the health variables, more than half of the older people studied reported dissatisfaction with their health (74.1%), had a cognitive deficit (40.4%), presented a state of frailty (33.4%), with functional disability for carrying out activities of daily living (26.5%), were at nutritional risk (60.8%), and had suffered a fall in the last year (43.5%). Regarding medication, most older people used some medication (87.8%), and 31.6% used more than 5 medications, which configures polypharmacy (Table 3).

Almost the entire sample reported having some morbidity (96.9%), with the most prevalent being arterial hypertension (72.4%), rheumatic diseases (70.8%), and cardiovascular diseases (28.1%). Most older people reported having 1 to 3 morbidities (57.8%) (Table 3).

The prevalence of depressive symptoms in the population studied was 74.5% (95% CI 71.5–81.3). In the crude analysis for socioeconomic and demographic variables, the presence of depressive symptoms was associated with the female gender, long-lived older people (80 years or more), with nonwhite ethnicity/skin color, widow/ers, who did not attend school, lived with family members (children or grandchildren), with no work activity, who did not receive pensions and benefits, with a family income of up to one minimum wage, and unsatisfactory perception of public security in their neighborhood. Being single was associated with a lower prevalence of depressive symptoms (Table 1).

For the variables related to lifestyle habits, the presence of depressive symptoms was associated with individuals with smoking habits and those who did not practice physical activities (Table 2).

In the variables related to health, older people with an unsatisfactory perception of their health, cognitive deficit, frailty, functional incapacity, who were at nutritional risk and using medication, using polypharmacy, and who reported stroke and osteoporosis as morbidities were associated with the outcome. The lowest prevalence of depressive symptoms was observed in the older people who reported rheumatic diseases (arthritis/arthrosis, rheumatism, and spine/back disease) in the crude analysis (Table 3).

Considering the criterion of $p<0.05$ for the multivariate analysis, depressive symptoms were positively associated with the following characteristics: female gender, age group of 80 years and over, not having attended school, lack of work activity, family income lower than one minimum wage, unsatisfactory self-perception of health, frailty, and unsatisfactory perception of security in the place of residence (Table 4).

Table 3. Bivariate analysis of depressive symptoms in older people in health care units according to the health variables, Rio Branco, Acre, 2016-2017.

Variables	N 284	NExp 900 (%)	Depressive symptoms		Gross PR (95%CI)	*P*-value
			No n 230 (25.5)	Yes n 670 (74.5)		
Self-perceived health						
Satisfactory	105	323 (35.9)	131 (57.0)	192 (28.7)	1	
Unsatisfactory	179	577 (74.1)	99 (43.0)	478 (71.3)	1.37 (1.25 – 1.50)	<0.001
Cognitive Deficit*						
Has no deficit	164	514 (59.6)	42 (18.3)	68 (10.1)	1	
Has deficit	110	349 (40.4)	187 (81.7)	602 (89.9)	1.22 (1.14 – 1.31)	<0.001
Frailty						
No	190	599 (66.6)	201 (87.8)	398 (59.4)	1	
Yes	94	300 (33.4)	28 (8.2)	272 (40.6)	1.36 (1.28 – 1.45)	<0.001
Functional Disability*						
No	210	652 (73.5)	201 (87.8)	451 (68.5)	1	
Yes	72	235 (26.5)	28 (12.2)	207 (31.5)	1.27 (1.19 – 1.36)	<0.001
Nutritional risk*						
No nutritional risk	94	286 (39.8)	97 (56.7)	183 (33.6)	1	
At nutritional risk	140	435 (60.8)	74 (43.3)	361 (66.4)	1.25 (1.15 – 1.37)	<0.001
History of falls*						
No	164	506 (56.5)	156 (74.6)	358 (54.7)	1	
Yes	110	390 (43.5)	53 (25.4)	296 (45.3)	1.06 (0.99 – 1.14)	0.101
Use of medications*						
No	164	115 (12.2)	42 (18.3)	68 (10.1)	1	
Yes	110	785 (87.8)	113 (49.1)	602 (89.9)	1.22 (1.06 – 1.41)	0.006
Polypharmacy						
No	8	640 (68.4)	9 (3.9)	19 (2.8)	1	
Yes	276	249 (31.6)	221 (96.1)	651 (97.2)	1.09 (1.02 – 1.18)	0.018
Self-reported morbidities*						
No	8	28 (301)	9 (32.1)	19 (67.9)	1	
Yes	171	872 (96.9)	142 (27.3)	378 (72.7)	1.07 (0.85 – 1.36)	0.568
Self-reported morbidities*						
Cancer	19	56 (6.2)	19 (33.9)	37 (66.1)	0.88 (0.74 – 1.06)	0.176
Diabetes	66	224 (24.9)	59 (26.3)	165 (73.7)	0.99 (0.91 – 1.07)	0.986
Heart/Cardiovascular	77	253 (28.1)	57 (22.5)	196 (74.5)	1.06 (0.99 – 1.15)	0.109
Chronic Kidney Failure	23	74 (8.2)	14 (18.9)	60 (81.1)	1.10 (0.98 – 1.23)	0.100
Tuberculosis	5	13 (1.4)	5 (38.5)	8 (61.5)	0.80 (0.53 – 1.21)	0.289
Cirrhoses	4	11 (1.2)	3 (27.3)	8 (72.7)	1.00 (0.72 – 1.39)	0.990
Stroke	31	108 (12.0)	16 (14.2)	92 (85.2)	1.15 (1.06 – 1.26)	0.002
Osteoporosis	75	234 (26.0)	41 (17.5)	193 (82.5)	1.14 (1.07 – 1.23)	<0.001
Arterial hypertension	204	650 (72.4)	167 (25.7)	483 (74.3)	1.00 (0.92 – 1.08)	0.983
Rheumatic Diseases	201	634 (70.8)	171 (27.0)	463 (73.0)	0.96 (0.88 – 1.03)	0.045

NExp = N expanded from the weights and the sample design; % = proportion from NExp; PR: Prevalence Ratio; *Differences in absolute frequency values correspond to losses or are not applicable.

Table 4. Bivariate analysis of depressive symptoms in older people in health care units according to socioeconomic and health variables, Rio Branco, Acre, 2016-2017.

Variables	Prevalence Ratio		
	Crude	Adjusted	*P*-value
Gender			
Male	1	1	
Female	1.15 (1.06 – 1.25)	1.10 (1.02 - 1.20)	0.013
Age group (years)			
60 to 79	1	1	
80 and over	1.21 (1.13 – 1.30)	1.13 (1.06 - 1.21)	<0.001
Education			
Attended school	1	1	
Did not attend school	1.19 (1.11 – 1.27)	1.11 (1.03 – 1.19)	0.006
Work activity			
Yes	1	1	
No	1.37 (1.20 – 1.57)	1.20 (1.05 - 1.37)	0.008
Family income			
≥1 MW	1	1	
<1 MW	1.10 (1.01 – 1.21)	1.10 (1.01 – 1.20)	0.025
Perception of security in the place of residence			
Satisfactory	1	1	
Unsatisfactory	1.34 (1.15 – 1.57)	1.46 (1.23 – 1.74)	<0.001
Self-perceived health			
Satisfactory	1	1	
Unsatisfactory	1.37 (1.25 – 1.50)	1.25 (1.14 - 1.37)	<0.001
Frailty			
No	1	1	
Yes	1.36 (1.28 - 1.45)	1.19 (1.11 - 1.27)	<0.001

Model adjustment: *deviance: 366*.079; loglikehood: -870,039; *Akaike information criterion: 1760,079* e *Bayesian information criterion*: 1808,398.

DISCUSSION

The present study identified a high prevalence of depressive symptoms in older people (74.5%; 95% CI 71.5–81.3) based on responses to the GDS-15. The most recognized variables associated with such symptoms were those related to gender, age group of 80 years and over, not attending school, lack of work activity, family income lower than one minimum wage, and frail health. The variable of perception of security in the place of residence was the largest factor of association among the variables mentioned above and has not yet been described in other studies.

National and international studies have shown prevalences ranging from 14.2% to 79.6% for depressive symptoms in noninstitutionalized older people[18-21]. The prevalence of depressive symptoms observed here was higher than those observed in other studies carried out in Brazil and similar to the study carried out in Mexico with older people aged 65 years or more identifying that 79.6% of the participants had depressive symptoms[20].

The high prevalence of depressive symptoms in these older people can be explained by the peculiar characteristics of the studied population,

especially those living in a region with socioeconomic conditions and social circumstances expressing deep inequalities compared to other regions in Brazil and countries around the world. Note that the typical biological declines of senescence added to the conditions of social, individual, and economic vulnerabilities of individuals lead to psychosocial illness, especially depression[22].

The association between depressive symptoms and sociodemographic factors is well defined in the scientific literature. Such symptoms are more prevalent in those with unfavorable socioeconomic status and health conditions than in those with better conditions. Being a female has already been identified as a factor associated with depressive symptoms, as found in the study by Mendes-Chiloff et al.[18] with 972 older people (OR=1.75; 95% CI 1.24-2.47) in the city of São Paulo. The association with the female gender can be explained by the social issues to which women are more susceptible, the potential stressful events determined by gender, and the low estrogen production during menopause, which have been pointed as risk factors for depression[23,24].

Likewise, older age is well established in the literature as associated with depression[24,25]. Aging is considered to be related to a greater predisposition to episodes of losses, mourning, and susceptibility to chronic diseases.

A low educational level was also associated with depressive symptoms, corroborating the cross-sectional studies carried out by Borges et al.[26] in Florianópolis with 1,656 older people (PR=2.11; 95% CI 1.46–3.05) and by Cheung and Chou[27] with 1,959 older people in Hong Kong (OR=1.85; 95% CI 1.85–2.86). Individuals with a higher level of education may find it easier to deal better with every day and stressful exposures. This emphasizes that low education will indirectly interfere with the socioeconomic situation of the elderly[28].

Not having a work activity similarly showed a positive association with depressive symptoms. Gazalle et al.[29] carried out a study in 2004 in the city of Pelotas, Rio Grande do Sul, to identify the highest occurrence of depressive symptoms in older people who did not work. The authors related these data with the devaluation of older people in the labor market, especially in developing countries, which results in the feeling of the individual being less useful to society when compared to younger people, a feeling caused by the social stigma of unproductiveness and the development of activities at work.

Family income below the minimum wage was a factor associated with depressive symptoms. This association reinforces that the socioeconomic conditions inherent to the individual contribute to the onset or maintenance of depressive symptoms. The relationship between this variable and the outcome was evidenced in other studies observing that the prevalence of depression decreases as family income increases[26].

The perception of security in the place of residence was positively associated with depressive symptoms in the older people studied. The relationship with the physical environment in which an older person lives influences environmental docility[30]. This is characterized by the basic functions of the environment, such as encouragement, freedom, and support, which are necessary for older people to exercise control and well-being[31]. Friendly and comfortable environments directly influence the behavioral performance of older people. If they feel insecure, they will find it difficult to leave the house, which will generate social isolation and difficulties playing an affective role. It should also be considered that the feeling of insecurity interferes with the dysfunctional production and performance of neurotransmitters, as well as with the increased production of cortisol, conditions directly related to depression[32].

Regarding health conditions, having an unsatisfactory self-perception of health was positively associated with depressive symptoms, a finding that is already consolidated in the literature[15]. The unsatisfactory perception of health (regular, bad, or very bad) is considered a good marker for health assessment and conditions of physical, mental, and social well-being. Borges et al.[26] state that, in some cases, the unsatisfactory perception of their health can already be understood as the presence of depressive symptoms in older people.

Depressive symptoms were associated with frailty, a finding similar to that found in another study. A study carried out with 367 older people in Italy using the depression scale from the center for epidemiological studies also observed an association with depression[33]. The association with frailty may be related to the simultaneous characteristics of these health conditions and configure exhaustion, psychomotor delays and inactivity[34]. Another factor related to these characteristics that is supported by scientific literature is the increased production of cytokines that act on sarcopenia in older people, which is directly related to the impairment of neuropsychological functions and frailty[35].

A possible limitation of the present study is that it is restricted to two PHC units. However, the methodology chosen allowed for a more detailed assessment of the health of the noninstitutionalized older person living in the areas covered by public health policies, raising hypotheses for broader studies related to the topic in the region.

Another relevant limitation is the possible existence of memory bias, considering that the methodology used required a recall method. It is a consensus that increased age interferes with memory and depression, reflects on the older person's cognition and possibly interferes with self-reported responses, which can then lead to biased responses. However, control over the variables of cognitive deficit and age was used for this limitation.

The number of losses in one of the health units was implied as a limitation. These losses are justified by the change of address, as the comprehensive area of the unit is considered a risk area and exposes the residents to situations of vulnerability. However, we emphasize the use of the sampling process to ensure randomness and representativeness of older people in the area investigated, considering that the sample studied shows a similar profile to the group of the population in the study area.

The main strengths of the present study are the methodological rigor, training, and quality control, in addition to the profile description of the older population in their area of coverage based on a validated questionnaire, making it possible to direct the treatment of PHC in the local network given the factors associated with depressive symptoms via measures of health education from the perspective of health problems and strategic planning in the work processes of the teams facing the health of older people. Furthermore, its results allow us to raise hypotheses for other longitudinal studies to verify the causality and factors potentially associated with the development of depression.

CONCLUSION

Screening for depressive symptoms showed a high prevalence of these symptoms in the population studied. This result expresses the need to work on sanitary responsibility in managing the phenomenon of population aging. It is necessary to understand that older people's diseases are progressive and associated with other conditions and are not a phenomenon exclusively addressed by the healthcare sector. Thus, an intersectoral approach is important, as some social conditions favor depressive symptoms and other various health problems.

At the same time, the specific role of public healthcare must reinforce the focus on health promotion strategies, prevention of identified risk factors, screening, early diagnosis, and access to appropriate therapeutic resources. The joint action of the healthcare network units, in particular the PHC units, is recommended with the situational analysis of the coverage area, knowledge of individual, household, and environmental characteristics associated with depressive symptoms, and the use of instruments for early screening of health problems affecting older people, in addition to the Mental Health Care Network to act for care and treatment along with the PHC. Future studies are also suggested to identify unstudied variables such as epigenetic studies and genetic determinants of depressive symptoms and depression.

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Translation, adaptation and validation of Frail Non-Disabled Questionnaire to the brazilian context

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Abstract

Objective: To translate, adapt and validate the Frail Non-Disabled Questionnaire (FiND) for the Brazilian context. *Method*: The steps recommended by the international literature for health instruments were followed: initial translation, synthesis of translations, back-translation, review by a committee of experts, pre-test, and assessment of the scale's psychometric properties. All ethical precepts were followed. *Results*: The translation and back-translation were performed by two independent and qualified translators. The expert review demonstrated its content validity. In the pre-test, FiND was easy to understand and apply. In the assessment of psychometric properties, the instrument demonstrated good values of reliability and reproducibility. Concurrent criterion validity was verified, finding a positive correlation with statistical significance between the FiND score and Fried's Fragility Phenotype and good values of sensitivity, specificity, positive and negative predictive values, and accuracy. The convergent construct validity was analyzed, indicating a positive correlation between the FiND score and depressive symptoms, and negative correlations with nutritional and cognitive status, and with the domains of the physical component of quality of life, with statistical significance. Discriminant validity was analyzed by comparing FiND means between the robust, non-frail, and fragile groups, with and without depressive symptoms, with a better and worse perception of quality of life, and with adequate nutritional status, at risk of malnutrition and with a state of malnutrition, which proved to be statistically significant. *Conclusion*: FiND has been translated, adapted, and validated for the Brazilian context.

Keywords: Translating. Validation Study. Frailty. Elderly. Questionnaire.

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INTRODUCTION

Population aging is recognized as a dynamic, progressive and irreversible process[1]. As a result of the rapid decline in physical and mental functions of older people, there is an increase in the burden on health and social care systems worldwide, and preventive actions against the functional deterioration of the older people population should be prioritized[2]. In this context, multidimensional assessment focusing on geriatric syndromes becomes necessary, paying attention to their identification and their treatment, producing better results for older people care, as they are mainly responsible for the loss of autonomy and independence of the older people[3].

Frailty is defined as a syndrome, which is characterized by a decrease in energy and is related to physiological changes in systems: musculoskeletal, neuroendocrine and immunological. Therefore, triggering a reduction in muscle mass, appetite disorders and chronic inflation[4]. The identification of frailty is essential for the implementation of multidimensional preventive interventions, which will favor a better quality of life[5].

Several instruments have been developed over the years to identify frailty in older patients[6]. However, the screening tools available in the literature have two main limitations: few are valid for self-administration and few allow us to differentiate fragility from disability – a broad term to indicate disabilities, limitations in the performance of activities and restrictions on social participation, associated with health states[5].

In this context, Cesari et al.[4] developed the *Frail Non-Disabled Questionnaire* (FiND) instrument in France, which is self-administered, composed of five items and follows the main multidimensional construction of the frailty phenotype, widely adopted as proposed by Fried et al.[5].

Not only, the instrument also addresses a specific section to exclude the presence of mobility impairment, which is considered the initial phase of the incapacitation process, and can represent an opportunity to spread awareness about frailty and disability in older people[5].

Given the above, making FiND available for wide use in Brazil is relevant and essential. Furthermore, so far, no instruments have been found that allow for the differentiation between incapable and frail older people in the Brazilian literature. Thus, the present work intends to carry out the translation, cultural adaptation and validation of the *Frail Non-Disabled Questionnaire* (FiND) for the Brazilian context.

METHOD

This is a methodological study of translation, cultural adaptation and validation of the *Frail Non-Disabled Questionnaire* (FiND)[5] instrument for the Brazilian context. For the process of translation, adaptation and validation of FiND, the steps recommended in the literature were followed sequentially[7].

This process had seven phases, namely: initial translation; synthesis of translations; back translation; reviews by a committee of judges; pretest; presentation and evaluation of reports on the cultural adaptation process; evaluation of the instrument's psychometric properties, after its translation and cultural adaptation[7].

Initially, the FiND instrument was submitted to translation from American English to Brazilian Portuguese by two qualified and bilingual translators, independently. Afterwards, the researchers and the translators defined a consensual version in Brazilian Portuguese of the FiND, evaluating the existing differences in the translations, considering the original version of the instrument.

Following the theoretical framework adopted, the consensual version in Brazilian Portuguese of FiND was reverted to American English by another qualified translator, with American English as the mother tongue, and with experience in translating texts in the health area. The translator did not know the objectives of the present study or the original version of the questionnaire used.

The back-translated version showed similarities with the original American English instrument. Thus, the Brazilian Portuguese consensual version

of the FiND and the back-translated version were evaluated by the committee of judges.

The expert committee was composed of five judges. The selection was based on the following requirements: fluency in the English language, training in the health area, experience in the subject of frailty in older people, as well as knowledge of the research methodology, that is, experience with translation and adaptation of instruments. Also, it is worth mentioning that the selection of the members participating in the expert committee took place by consulting the lattes platform (www.lattes.cnpq.br). They evaluated the semantic, idiomatic, experimental and conceptual equivalence of the consensual version of FiND, producing its pre-final version.

Afterwards, the pre-test was carried out. For this stage, 46 older people from the community who were assisted by the Family Health Units (USF) in a city in the interior of the state of São Paulo were selected. In this stage of evaluation of the FiND instrument, participants analyzed the clarity and understanding of all items that make up the FiND. Once the pre-test was carried out and the final version of the FiND was established, the last step related to the assessment of the instrument's psychometric properties was started, including the assessment of the instrument's reliability and validity.

The sample for the evaluation stage of the instrument's psychometric properties consisted of 234 older people assisted by the USF in a city in the interior of the state of São Paulo. Inclusion criteria were: being aged 60 years or over and being cared for by the city's USF. Exclusion criteria were: individuals who had severe reported deficit of vision or hearing; cognitive impairment tracked by the Addenbrooke Cognitive Examination - Revised Version (ACE-R)[8] and people with functional limitations due to acute or chronic diseases that prevented the participant from performing part of the Fried Frailty Phenotype[4] (hand grip test and walking test).

The instruments used in the assessment of psychometric properties, for the analysis of construct validity, were applied, in addition to FiND[5], the Fried[4] Frailty Phenotype, the ACE-R[8], the Geriatric Depression Scale - short version (GDS-15)[9], the Mini Nutritional Assessment (MNA)[10] and the Short Form – 36 (SF-36)[11]. The instruments were applied through individual interviews, conducted by three properly trained graduate students.

The FiND was developed by Cesari et al.[5] in English in France in 2014, it is composed of five items, the first two (A and B) being designed to identify patients with disabilities, while the last three (C, D and E) are intended for the assessment of signs, symptoms or conditions generally considered as components of the frailty syndrome[5]. Total score ranges from zero to 5 points. If the older patient scores on items A or B, they are considered incapable. If they do not score on items A and B, but score on C, D or E, they are considered fragile. Finally, if they do not score on any item, the older person is considered robust/not frail[5].

Fried's Frailty Phenotype was developed by Fried et al.[4] as an assessment for frailty syndrome. To this end, it consists of five criteria that assess the condition of frailty. The ACE-R is a useful tool in diagnosing dementia at an early stage. In order to facilitate its application and add new language questions, in Brazil, the revised version was translated and validated by Carvalho and Caramelli in 2007[8], comprising questions that assess five cognitive domains.

The GDS-15 is often used to detect depressive symptoms in older patients. In Brazil, the 15-questions short version (GDS-15) was translated and validated by Almeida and Almeida in 1999[9]. The MNA was developed by Vellas et al.[10] in 1999, and refers to a tool that provides a simple and quick method to identify older patients who are at risk of malnutrition or who are already malnourished. The SF-36, on the other hand, refers to a generic instrument for assessing quality of life, easy to administer and understand, which was translated and validated for the Brazilian context by Ciconelli et al.[11] in 1999.

For data analysis, descriptive analyzes and verification of data normality were performed using the Kolmogorov–Smirnov test.

To verify the content validity of the FiND, the Content Validity Index (CVI) was used to assess the experts' answers regarding each item present in the FiND. The judges' assessment instrument

consisted of a Likert-type response scale from 1 to 4 points, and for each item of the scale the specialist could consider the item: 1= not equivalent; 2= little equivalent; 3= equivalent; 4= very equivalent. For the interpretation of the CVI, the recommended value of 0.80 or more was adopted. The CVI score was calculated by the sum of agreement of the items that received scores of "3" and "4" by the experts, divided by the total number of responses.

For the analysis of the psychometric properties of the FiND, it was verified: the internal consistency of the instrument, through the Kuder-Richardson 20 (KR-20)[12]; the stability of the FiND score, through the Intraclass Correlation Coefficient[13]; the concurrent criterion validity of FiND, through Spearman's Correlation Coefficient, relating its score to Fried's Frailty Phenotype[4], in which the magnitude of the correlations was classified according to the proposition of Levin and Fox[14]. Not only, to verify the validity of the concurrent criterion of the instrument, the sensitivity, specificity, accuracy and positive and negative predictive values were also analyzed, with respective 95% confidence intervals, in addition to the quantitative-qualitative linear relationship between the area under the ROC curve (AUC)[15]; the convergent construct validity of the FiND instrument, through Spearman's Correlation Coefficient, relating its score obtained with the scores of the physical component domains of the SF-36, ACE-R, MNA and GDS-15[16].

In addition, the Kruskal-Wallis and Mann Whitney tests were performed to verify the discriminant validity of the FiND instrument, according to the level of frailty assessed by the Fried frailty phenotype (robust, non-frail and frail); the level of depressive symptoms (no depressive symptoms, with mild and severe depressive symptoms); the perception of quality of life (better and worse); nutritional status (malnutrition status, at risk of malnutrition and adequate nutritional status); and cognitive (with and without signs of cognitive impairment).

The significance level adopted was 5% (p-value≤0.05). This research was approved by the Ethics Committee with Human Beings of the Federal University of São Carlos (Opinion Number 1891428) and all ethical precepts set out in Resolutions 466/12 and 510/2016 of the National Health Council were respected.

RESULTS

Following the steps developed in the research, two translated versions of FiND were obtained, in addition to a consensual version and a back-translated version to the original language.

The back-translated version showed similarities with the original American English instrument. Thus, the Brazilian Portuguese consensual version of the FiND and the back-translated version were evaluated by the committee of judges.

After the evaluation of the committee of judges, it was found that of the 21 items that make up the FiND, 14 presented values of CVI=1, being considered equivalent and kept in the pre-final version of the instrument. The other items were reanalyzed and modified by the researchers, as suggested by the experts. After the modifications, the pre-final version was resubmitted and approved by all judges. Subsequently, the pre-final version of the instrument was obtained and it was tested with 46 older people from the community who met the eligibility criteria. At this stage, the applied version was not changed, being judged to be clear, quick and easy to understand. Thus, no modifications were suggested.

Finally, in the last step of evaluating the psychometric properties of the instruments, the study included 234 older people. There was a predominance of female respondents (67.95%), white (73.93%) and married (59.40%). Regarding the education of the participants, there was a predominance of older people with 1 to 4 years of schooling (51.30%), followed by older people with more than 9 years of schooling (18.80%), with 5 to 8 years of schooling (17.94%) and with less predominance, illiterate older people were observed (11.96%). It was also found that there was a predominance of older people who were Catholics (70.51%), practitioners of any religion (64.22%), retirees or pensioners (79.49%), who lived in their own homes (91.45%), who used at least one medication continuously (88.89), and who had not suffered falls in the last 12 months (64.53).

Regarding the instrument's reliability, the value found for the KR-20 coefficient was 0.642; however, it was found that item C (3) had less consistency and when excluded, the value found was 0.705, considered satisfactory. However, this issue is of paramount importance for the instrument, as it is about weight loss, therefore, it was decided to leave it on the scale. Satisfactory stability was also observed, since the value found for the test-retest was ICC=0.841 (95% CI 0.718; 0.910).

The FiND showed satisfactory concurrent criterion validity when correlated with the instrument considered the gold standard for the assessment of physical frailty. There was a positive correlation, of strong magnitude and with statistical significance between FiND[5] and Fried[4] Frailty Phenotype (r=0.603; p<0.001).

Not only, it was verified satisfactory concurrent criterion validity of the FiND instrument through the analysis of the ROC curve. The ROC curve drawn for the scale is shown in Figure 1, the area under the ROC curve drawn for the score obtained in the FiND reached a satisfactory value of 0.855 (95% CI [0.793;0.917]; p<0.001).

The analysis of the values showed that the ideal FiND cutoff point for screening for frailty is 2.5, resulting in a sensitivity of 80.85% [95% CI (50.88; 97.06)] and specificity of 83.33% [95% CI (75.71; 94.51)]. The positive and negative predictive values for this cutoff were 55.88% [95% CI (33.45; 80.57)] and 94.34% [95% CI (85.67; 99.33)], respectively. The accuracy of the instrument was 86.96% [95% CI (76.18; 93.50)].

It can be seen in Table 1 that the FiND presented satisfactory convergent criterion validity when correlated with the scores of the ACE-R, GDS-15, MNA instruments, and the SF-36 physical component domains (Functional Capacity, Physical Aspects, Pain and General Health).

Table 2 shows that FiND had satisfactory discriminant construct validity, since the instrument was able to differentiate the groups according to the level of frailty (assessed by Fried's frailty phenotype), and the presence of depressive symptoms (assessed by GDS-15), perception of quality of life (assessed by SF-36), nutritional status (assessed by MNA) and cognitive status (assessed by ACE-R).

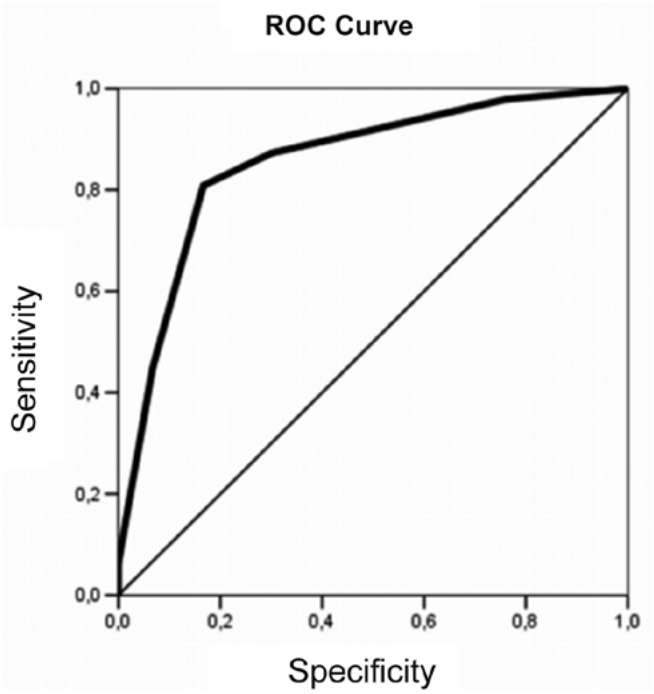

Figure 1. ROC curve for FiND, using Fried's Frailty Phenotype as the gold standard. São Carlos, 2018.

Table 1. Analysis of the convergent construct validity of the FiND instrument through the analysis of Spearman's Correlation Coefficient with the GDS-15, ACE-R, MNA and the SF-36 physical component domains. São Carlos, 2017-2018.

		Instruments						
		GDS-15	ACE-R	MNA	SF-36			
					FC	PA	Pain	GHS
FiND	r	0.465	-0.335	-0.436	-0.745	-0.421	-0.496	-0.482
	p	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*
	n	234	234	234	234	234	234	190

r: Spearman's correlation coefficient; p: p value; n: Sample size; * Statistically significant; FC: Functional Capacity; PA: Physical Aspects; GHS: General Health Status.

Table 2. Analysis of the discriminant construct validity of the Brazilian version of FiND. São Carlos, São Paulo, Brazil, 2017-2018.

Instrument / Categories	FiND		*p* value
	N	Mean ± SD *	
Fried's Frailty Phenotype			
Robust	49	0.59 ± 0.73	<0.001**,a
Pre-Frail	131	1.56 ± 1.15	
Frail	48	3.19 ± 1.14	
MNA			
Malnutrition Status	6	4.33 ± 0.82	<0.001**,b
At Risk of Malnutrition	28	2.93 ± 1.33	
Normal Nutritional Status	200	1.44 ± 1.21	
ACE-R			
With evidence of Cognitive Alteration	127	1.97 ± 1.47	0.002***
Without evidence of Cognitive Alteration	107	1.36 ± 1.18	
GDS-15			
No Depressive Symptoms	157	1.29 ± 1.18	
Mild Depressive Symptoms	60	2.3 ± 1.41	<0.001**,c
Severe Depressive Symptoms	16	3.25 ± 1.12	
SF-36			
Functional capacity			
Worst quality of life	119	2.51 ± 1.30	<0.001***
Better quality of life	110	0.75 ± 0.68	
Functional Assessment			
Worst quality of life	60	2.62 ± 1.43	<0.001***
Better quality of life	169	1.33 ± 1.18	
Pain			
Better quality of life	114	2.27 ± 1.39	<0.001***
Worst quality of life	115	1.06 ± 1.05	
General Health Status			
Worst quality of life	118	2.24 ± 1.42	<0.001***
Better quality of life	111	1.05 ± 1.02	

*SD=Standard Deviation; **Kruskal-Wallis test; ***Mann Whitney test; [a]Statistical differences between the robust and pre-frail, robust and frail, and frail and pre-frail groups; [b]Statistical differences between groups under malnutrition status and normal nutritional status, and at risk of malnutrition and normal nutritional status; [c]Statistical differences between the groups with no depressive symptoms and mild depressive symptoms, and with no depressive symptoms and severe depressive symptoms;

DISCUSSION

This study translated, adapted and validated the FiND for the Brazilian context, aiming to fill a gap in the area of healthcare for older people in Brazil. For the translation and adaptation processes, the steps recommended by the literature were followed, significantly contributing to the quality of the result obtained, indicating that the Portuguese version of the instrument is linguistically faithful to the questionnaire in its original language (English), and its adequacy confirmed by the evaluation of a committee composed of experts.

Several instruments are produced in one language and later translated into others, and the validation by experts stage is very important in these processes of translation and cultural and linguistic adaptation of scales and questionnaires[17]. According to Alexandre and Coluci[18], the translation and adaptation of an instrument is a complex process due to the existence of cultural and language differences between the countries involved. Thus, the inadequate selection of measurement instruments of low methodological quality can be considered a bias in the conclusions of studies, and the standardization in the translation and adaptation of instruments is highly justified[19].

The studied sample was described in terms of sociodemographic characteristics. There was a predominance of females, with low education (1 to 4 years), white and married, corroborating several other studies available in the national and international literature[20–22]. It is still possible to verify that the literature shows us that being female and of advanced age can be predictors of frailty[21,23,24].

Regarding the instrument's psychometric properties, the homogeneity and reproducibility of the FiND were verified through the analysis of the instrument's internal consistency and its test-retest, and the results obtained were considered satisfactory. Several instruments available in the literature for the assessment of frailty presented satisfactory homogeneity and reproducibility, being used in large-scale studies. As an example, the *Frailty Index*, PRISMA-7, CHS Index and FRAIL instruments are cited [4,24-26].

Not only, there was satisfactory concurrent criterion validity of the FiND instrument, as it correlated positively and strongly with the instrument considered the gold standard for the assessment of physical frailty, and presented satisfactory results through the analysis of the ROC Curve, demonstrating satisfactory sensitivity, specificity, positive and negative predictive values and accuracy.

In the study of the original version of the instrument, data on the reliability of the scale were not reported. Regarding its validity, only data on its accuracy were found, through its specificity and capacity to identify non-incapable frail patients, corroborating the data found in the present study. In this context, the authors concluded that the FiND instrument showed good ability to correctly identify frail older people without disabilities living in the community[4].

Still regarding the accuracy of the FiND instrument, Mirabelli et al.[27] used the instrument to assess frailty in clinical practice with patients with vascular diseases, and observed good sensitivity, but low specificity. Data on instrument reliability were not reported.

In the present study, satisfactory discriminant construct validity was also observed, since the FiND instrument was able to discriminate the older people groups according to the level of frailty, presence of depressive symptoms, perception of quality of life, nutritional and cognitive status, corroborating several studies that investigate the relationship between the studied variables[28–32].

Rossetti et al.[28] investigated the relationship between frailty and depressive symptoms and burden of caregivers of older people in a context of high social vulnerability, and observed a positive and moderate correlation between frailty and depressive symptoms, concluding that, as the frailty levels increased, depressive symptoms became more prevalent in the studied population. Not only, Ribeiro et al.[29] explored the relationship between depressive symptoms and frailty in 91 centenarians from two different regions of Portugal and observed that centenarians who were classified as frail had higher risks of depression compared to pre-frail

centenarians, concluding that depression is a frequent condition in frail older people.

Regarding the relationship between frailty and quality of life, Jesus et al.[30] assessed the level of frailty and its relationship with the perception of quality of life of older people registered in Social Assistance Reference Centers in a city in the interior of the state of São Paulo. Paulo, Brazil and observed negative correlations and weak to moderate magnitude between frailty and quality of life, indicating that frail older people had a worse quality of life. In their systematic review study, Kojima et al.[31] concluded that older patients classified as frail or pre-frail had significantly lower physical and mental quality of life than those classified as non-frail.

In order to investigate the relationship between frailty and nutritional parameters reported by adults residing in the United States and observed the relationship between nutritional parameters and frailty, which contribute to the increased risk of death[32].

In order to analyze the relationship between cognition and frailty in older people, Brigola et al.[24] carried out a systematic review of the literature on the subject, analyzing 19 studies. As a result, all studies established a relationship between cognition and frailty, in which frailty components and cognitive domains were related. Furthermore, Hao et al.[32] investigated the impact of frailty and cognitive impairment in 705 older people in the Chinese community and concluded that older people who had both conditions concomitantly were associated with an increased risk of death, with frailty and cognitive impairment being risk factors for death in older people.

Based on the above, the evidence of reliability and validity of the Brazilian version of FiND is confirmed, and this instrument is available for wide use in Brazil, considering that the identification and early screening of frailty, carried out through simple tools by professionals in the health area, caregivers and family members are fundamental for the implementation of actions and favor the improvement of the quality of life of the population in the process of becoming frail.

In the present study, as limitations, the transversal cut stands out, which did not allow the verification of the responsiveness of the FiND instrument, therefore, it was not possible to verify its sensitivity for detecting changes. Not only that, it was not possible to find studies on the translation, adaptation and validation of the FiND instrument for other contexts, which made it difficult to compare the results obtained with other studies, limiting the discussion based on the results presented. In addition, it is worth mentioning that the FiND was developed based on Fried's frailty phenotype and it was adopted as a criterion to test concurrent validity, finally, the non-adoption of an instrument that specifically assesses disability, as was done in the original study of the instrument's elaboration.

CONCLUSION

Based on the proposed objectives and results obtained, it can be concluded that the FiND instrument is translated, adapted and validated for the Brazilian context (additional material). It demonstrated satisfactory psychometric properties (reliability, concurrent criterion, convergent and discriminant construct validity).

It is expected that this study will help, through the availability of the Brazilian version of FiND, in the screening of frailty in the Brazilian older people population, thus enabling the implementation of actions by health professionals, with the aim of reversing or even preventing this syndrome. It is also recommended that further studies be carried out in order to expand and confirm the psychometric properties of the Brazilian version of FiND in different populations and contexts.

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Influenza vaccination in older adults living in rural riverside areas: potential implication of the findings regarding the covid-19 pandemic in Amazonas

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Abstract

Objective: To evaluate the proportion of unvaccinated older adults and the reasons that interfere with immunization against Influenza in rural riverside locations, discussing the potential implications on vaccination against SARS-CoV-2 infection. *Method:* Household-based survey conducted in 38 rural riverside locations in Manaus, Amazonas, Brazil, covered by a primary care Fluvial Health Unit. Participants answered a questionnaire that investigated living conditions, health status and access to health services. In this study, the outcomes related to immunization against Influenza in the last 12 months and the main reported reason for non-vaccination were evaluated. Descriptive data analysis was performed, followed by logistic regression to identify factors associated with non-vaccination. *Results:* Of the 102 older adults included in the study, 28 (27.5%) reported not vaccinating against Influenza in the previous year. The main reasons were lack of information about vaccination (60.7%) and barriers to accessing health services (28.6%). An increased chance of non-vaccination was identified among those who did not see a doctor in the last year (OR=4.18; 95%CI=1.57-11.11) and those with higher household income (OR=1.08; 95%CI= 1.02-1.14). *Conclusion:* A high proportion of older adults reporting no immunization against Influenza was identified. The reasons for non-vaccination may also represent barriers to the vaccination of this population group against COVID-19. Thus, it is necessary to improve the vaccination planning in rural riverside contexts, developing more contextualized strategies to assure coverage for this population, more vulnerable to the effects of respiratory diseases.

Keywords: Rural Population. Vaccination Coverage. Health of the Elderly. Influenza Vaccines.

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INTRODUCTION

Social and health inequalities are striking in the Brazilian territory[1], especially among rural populations, characterized by worse living and health conditions, geographical and financial barriers in accessing services, insufficiency of health professionals and fragile care structure[2].

In addition to being more vulnerable to such inequities, older people make up the population group at greater risk of respiratory and systemic diseases[3]. The COVID-19 pandemic accentuated its health risks, placing them as a priority group for vaccination, as a strategy to control the impacts of the epidemic[4]. In this context, reflecting on the main reasons that make it difficult to vaccinate this group against Influenza is relevant, since such motivations could also represent obstacles to vaccination against COVID-19.

Thus, the present study aimed to evaluate the proportion of unvaccinated older people and the reasons that interfere with immunization against Influenza in rural riverside localities, discussing the potential implications for vaccination against SARS-CoV-2 infection.

METHOD

Household-based epidemiological survey, carried out in 2019 in 38 rural riverside locations along the left bank of the Rio Negro, Manaus (AM), Brazil, located in the coverage area of a primary care fluvial health unit (UBSF) in the municipality. For the study, stratified random sampling was performed, calculated based on the number of individuals and households informed by community health agents working in the territory. The selection of households in each location was systematic random. The sample size calculation considered the probability of finding the survey's interest groups in households, including older people aged 60 years or more (p=0.118), a prevalence of 50% of the outcomes of interest and 95% accuracy, with 10% being added for possible losses or refusals, with adjustment for the finite population (N=277), with 287 of a universe of 765 households dispersed throughout the territory having been visited. The riverside locations studied are accessible only by river, taking about 12 hours to travel regularly between the urban area of the municipality and the most distant location in the researched region.

The selected older people answered a questionnaire developed in the *Research Electronic Data Capture* (REDCap) application regarding socioeconomic issues, related to health and access to health services. The main outcome of the study was evaluated using the question "*In the past 12 months, have you had a flu vaccine?*" For those who had not been immunized, the main reason for non-vaccination was asked through an open question. The older people's responses regarding the reasons for non-vaccination were analyzed and classified into three categories, defined after analysis: 1-Weaknesses of information about vaccination, 2-Barriers to access to vaccination and 3-Other specified reasons.

After checking for inconsistencies, data were exported for descriptive analysis of the variables. Then, logistic regression analysis was performed between the independent variables and the non-vaccination outcome, estimating the adjusted odds ratios (OR) and their respective 95% confidence intervals. The variables included in the multiple analysis were sex, age, logarithm of household income (in R$), having already attended school, self-perceived health and referring a medical appointment in the last 12 months.

This study is linked to the project *Exploratory study of living conditions, health and access to health services of rural riverside populations of Manaus and Novo Airão, Amazonas*, approved by the Research Ethics Committee involving Human Beings, under No. 1,742,086.

RESULTS

In the 287 households visited, 102 older people were evaluated, 56 male (54.9%) and 46 female (45.1%). The mean age was 67.8 (±sd=8.1), ranging from 60 to 90 years. In households with older people, the average number of residents was 3.2 (minimum=1, maximum=9). The average monthly household income was R$1,600.17 (±sd=836.19) and 44 (43.1%) respondents had never attended school. Among the older people, 28 (27.5%) were not vaccinated against Influenza in the previous year (95%CI: 19.6-37.1). Table 1 shows the main reasons reported by the older people for non-vaccination.

Table 1. Reasons related to non-vaccination against Influenza in older people living in rural riverside locations, Manaus, Amazonas, 2019.

Main reason for not vaccinating against Influenza	n=28 (%)
Weakness of information regarding vaccination	
Rarely stricken with flu	2 (7.14)
Didn't know it was necessary to be vaccinated	3 (10.72)
Didn't know where to get vaccinated	1 (3.57)
Fear of adverse vaccine reactions	4 (14.29)
Is afraid of the injection	1 (3.57)
Doesn't believe the vaccine protects	3 (10.72)
Had the flu during the vaccination campaign, but did not seek to be vaccinated when healthy	1 (3.57)
Does not have vaccination card	1 (3.57)
Unable to inform	1 (3.57)
Barriers in access to vaccination	
Short time offer of the vaccine	1 (3.57)
Absence of companion for travel to the health service	2 (7.14)
It was not offered at health service	1 (3.57)
Not being present in the community at the time of vaccination	3 (10.72)
Lack of fuel resource	1 (3.57)
Other reasons specified	
Medical contraindication	1 (3.57)
Did not consent to vaccination	1 (3.57)
Reported allergy to the vaccine	1 (3.57)

Source: survey data, 2021.

Most of the reasons specified by the older people for non-vaccination were the weaknesses of information about vaccination (60.71%), followed by reasons related to barriers to access to vaccination (28.58%). Regression analysis showed a greater chance of non-vaccination among the older people who did not see a doctor in the last year (OR=3.75; 95%CI=1.41-9.96) and among those with higher household income (OR=3.03; 95%CI=1.18-7.79). No association was found with sex (OR=1.01; 95%CI=0.39-2.67), age (OR=0.99; 95%CI=0.94-1.06), having attended school (OR =0.63; 95%CI=0.23-1.72) and self-perception of health (OR=1.04; 95%CI=0.74-1.46).

DISCUSSION

The percentage of older people not vaccinated against Influenza who live in the rural riverside locations studied is worrying. The findings suggest that the non-vaccination of the older people is multi-causal, involving both failures in the information process regarding the importance of the vaccine, as well as barriers to accessing the health service. The motivations found may not be limited to Influenza vaccination, but also represent impediments to vaccination coverage against COVID-19 in the territory in question.

The health education provided to the user is essential to clarify the importance of vaccination in the prevention of diseases, the potential adverse effects and to demystify mistaken information about the vaccination process[5]. In this sense, the findings suggest that individuals with higher household income represent an important target audience for actions aimed at expanding vaccination coverage. The occurrence of adverse effects and discredit to vaccination are reported as important

causes of evasion of older people in vaccination campaigns against Influenza[6], with the potential to also negatively interfere in the vaccination campaign against COVID-19.

It is necessary that vaccination plans consider the geographic barriers present in the rural riverside context and promote strategies to expand access, not limiting themselves to reproducing the planning adopted in urban centers[7]. Such measures can ensure adequate vaccination coverage, especially among older people, who represent a significant portion of the rural population, given the selective exodus of young people[8], in addition to constituting the group considered to be at greatest risk for mortality from respiratory diseases such as COVID-19[4].

By residing in the territory and acting as a link with the service, the community health agent is a key actor in community-centered health education actions. They also play a relevant role in the active search for non-immunized older people and in recognizing the territory, in passing on information and in discussing vaccination strategies with the other components of the health team[9]. Regular access to the primary health care service is also an important strategy for vaccination, and the older people who reported not having a medical appointment in the last 12 months were almost four times more likely to not have been vaccinated against Influenza either. The operational organization of the UBSF can be maximized in order to expand vaccine opportunities, as well as promote prior agreements between the team and the community, aiming to contribute to increasing vaccine coverage. In addition to the adequate organization of services, the provision of adequate information to users regarding the need to return for annual doses, or a second vaccine dose, as in the case of COVID-19, is essential for coverage to be adequately achieved.

It is reiterated that low vaccine coverage can contribute to viral mutation and consequent resistance of variants to vaccines[10], an increase in the number of cases and deaths in the population, especially in the most vulnerable groups, such as older people. The study has as a limitation the use of referred information, subject to information bias. Considering the cross-sectional design of the study, causal inferences based on measures of association should also be interpreted with caution. Although the intention of the study is to provoke a critical reflection based on the findings regarding influenza vaccination, in order to contribute to the organization of services in view of the reality imposed by the COVID-19 pandemic, the behavior related to the two diseases may not be similar.

CONCLUSION

The present study analyzed the reasons related to non-vaccination against Influenza in older people living in rural riverside locations, in a context of urgency for vaccination against COVID-19. In addition to the difficulties faced by the population related to barriers to accessing services, weaknesses were observed in the effective availability of information about vaccination among older people. The guarantee and expansion of vaccination coverage for rural populations along the rivers demands a specific strategic planning that takes into account cultural competence and the ways of life and situations of vulnerability, allowing for greater equity in access to health services and actions.

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Hospitalizations for diabetes *mellitus* in older people in Brazil from 2001 to 2020: temporal trends and spatial patterns

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Abstract

Objective: To analyze temporal and spatial patterns in the distribution of hospitalization rates for diabetes *mellitus* in older people (60 years or older) in Brazil. *Method:* Ecological study with data from the Hospitalization Information System of the Unified Health System about hospitalizations for diabetes in older people in Brazil from 2001 to 2020. The hospitalization rate/100,000 older people was calculated, and the temporal trend was analyzed using the Joinpoint Regression. Univariate and bivariate MoranMap maps were constructed, and the Skater technique was applied to analyze the association between hospitalization rates and contextual variables by Immediate Urban Articulation Regions. *Results:* Annual rates show that Brazil registered 43.78 hospitalizations for diabetes/100,000 older people in 2001 and 21.55/100,000 older people in 2020, with a significant downward trend (AAPC=-3,4% IC95% -4,5; -2,3). There was an average spatial autocorrelation by global Moran (I<0,3) in the last five years with regions with high rates of hospitalization in the North and Northeast of Brazil. The bivariate analysis showed the formation of clusters with high rates of hospitalization where there was a high coverage of the Family Health Strategy and a supply of professionals, however, in areas with worse social indicators. The Skater map showed clusters of areas with low hospitalization rates in areas of favorable social conditions in Southeast Brazil. *Conclusion:* The expansion of government policies to protect the health of older people has marked a national commitment to the healthy aging of the population, which is reflected in the decline in hospitalization rates for diabetes among older people in Brazil.

Keywords: Hospitalization. Elderly. Diabetes Mellitus. Trend. Spatial Analysis.

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INTRODUCTION

Chronic non-communicable diseases (NCDs) are characterized as one of the biggest public health problems in the world, with emphasis on four groups of diseases: cardiovascular diseases, cancers, chronic respiratory diseases and diabetes[1].

Among these diseases, diabetes mellitus (DM) is one of the global health problems that poses the greatest threats in the 21st century due to the risk of developing a series of serious and fatal complications, leading to a greater need for medical care, reduced quality of life and excessive stress in families. Added to this factor, in 2019, it was estimated that 463 million people worldwide had DM, and projections indicate that this number could reach 578 million people in 2030 and 700 million in the year 2045[1,2].

In Brazil, DM is also highlighted, as the country occupies the 4th place in the world ranking with the highest prevalence of DM in the population, recording about 12.5 million cases of diabetes in individuals aged 20 to 79 years old, of which, almost a third of diabetics are concentrated in the older population over 60 years[3,4].

In older people, complications resulting from DM compromise functionality in general, being related to a higher risk of premature death, greater association with other comorbidities, and especially with major geriatric syndromes[4]. In addition, the highest rates of hospital admissions and longer bed occupancy are observed among people aged 60 years and over when compared to other age groups[5].

Thus, due to the complications of DM, the disease imposes a great economic burden on health systems due to the high rates of hospitalizations and greater use of health services, being more impactful in developing countries[4]. This finding was made for the Brazilian public network, with an estimated average cost of R$ 1,478.75 for the year 2014 for a hospitalization of an individual aged 20 to 79 years with DM, while the total costs of hospitalizations attributable to DM, were, approximately R$ 463 million[6,7].

DM is a health problem considered a Primary Care Sensitive Condition (PCSC) and high rates of hospitalizations for PCSC in a population, or subgroup (s), indicate serious problems in accessing the health system or in its performance[8]. In this sense, the analysis of hospitalizations of older people for this cause can help to identify areas that are clearly subject to improvement, highlighting problems that require better follow-up and coordination between the levels of care.

In addition to the health context, it is necessary to emphasize the social context that can also interfere negatively or positively in the illness of this population, being important the social analysis and how this interferes with the health of the older person[9].

Thus, considering that the occurrence of DM cases in Brazil prevails in the older population and several factors can contribute to the complications of this disease, the question is: what is the trend in hospitalization rates for DM in older people in Brazil? Is there a correlation between these hospitalization rates and the supply of primary care health services and social indicators?

Thus, it is observed that the prevalence of DM in older people is an important topic for public health issues and to analyze their behavior in relation to hospitalizations and the social factors that influence these hospitalizations, it is essential as it allows to help in the assessments of the effectiveness of prevention and control strategies that have been adopted over time in Brazil, in addition to supporting prospective planning aimed at reducing its impact on the older population and on the country's economy.

From this, the objective of this study is to analyze temporal and spatial patterns in the distribution of hospitalization rates for DM in older people (60 years old or more) in Brazil based on data collected from the Unified Health System (SUS) in the period between 2001 and 2020.

METHOD

This is an ecological population-based study with a mixed design, time trend and multiple groups, based on secondary data recorded in the SUS Hospital Admissions Information System (SIH-

SUS), of the Informatics Department of the Unified Health System[10].

Hospital admissions resulting from DM were considered as the outcome variable, categorized based on the International Statistical Classification of Diseases and Related Health Problems - 10th Revision (ICD-10 - code E11 to E11.9), which occurred in Brazil in older people (60 years or more) in the period between 2001 and 2020, by place of residence.

Hospitalization rates/100,000 older people were calculated for Brazil, large geographic regions and for Immediate Urban Articulation Regions (RIAU). Population data by geographic area and by age were obtained from information from the Demographic Censuses and 2010 inter-census projections on the website of the Brazilian Institute of Geography and Statistics (IBGE)[11].

For the analysis of temporal trends rates of hospitalizations for DM in older people, the national territory and the five major geographic regions (North, Northeast, South, Southeast and Midwest) were considered, according to the country's political-administrative organization.

For the analysis of spatial distributions, the RIAU were used. These correspond to a reorganization of Brazilian municipalities proposed by the IBGE, demonstrating an analysis of the Brazilian territorial dynamics in which the networked relationships of cities are established as fundamental elements of interconnection of management, infrastructure and productive activities, allowing for the establishment of understandings of the socio-spatial transformations taking place in the country[12]. Analyzes by RIAU were used to the detriment of municipalities in order to minimize bias in calculating rates for small areas.

For the analysis of temporal trends in hospitalizations for DM in older people in Brazil and in the five Brazilian regions, the *Joinpoint* Regression analysis was performed. This type of analysis is useful for describing changes in trend data[13].

In this model, the *Annual Percentage Change* (APC) was estimated, based on the trend of each segment. To quantify the trend over the period of the years analyzed, the *Average Annual Percent Change* (AAPC) was calculated, based on the accumulated geometric average of the APC trends[13].

To perform the spatial autocorrelation analysis of the outcome variable, the Moran Global index was used, which assesses the spatial interdependence relationship between all polygons in the study area and expressed through a single value for the entire region. The analysis of this index provides statistical significance (p value), in which values very close to zero indicate the non-significant spatial autocorrelation of the values between its neighbors; values below 0.50 indicate weak autocorrelation; values between 0.50 and 0.75 are characterized as medium autocorrelation and values above 0.75 demonstrate strong autocorrelation[14].

To verify the distribution pattern of these spatial autocorrelation rates of the outcome variable, the univariate local Moran test was applied (*Local Indicators of Spatial Association* – LISA), with the aim of verifying whether there was spatial dependence in the occurrence of hospitalizations for DM in older people in the 482 RIAU in Brazil and, for that, the average rates per quinquennium were calculated: 2001-2005; 2006-2010; 2011-2015; 2016-2020. Thus, the *MoranMap* was presented to assess the formation of clusters classified as: high-high, low-low, low-high and high-low[15]. The calculation of rates per quinquennium was used to avoid random fluctuations in the occurrence of events.

Assuming the process of social determination of health and disease phenomena, we sought to analyze the spatial association between the average rate of hospitalization for DM in older people in the last five years (2016-2020) by RIAU and independent variables that are related to the outcome variable. Therefore, the bivariate local Moran test was applied and the *MoranMap* was presented with the areas classified as high-high, low-low, low-high and high-low[15]. For this analysis, the independent variables represented by the contextual indicators of the RIAU were: (V1) Coverage of the Family Health Strategy (FHS); (V2) Offer rate of FHS Nurses per 100,000 inhabitants; (V3) Offer rate of FHS Physicians per 100,000 inhabitants; (V4) Proportion of poor people; (V5) Municipal Human Development Index (MHDI); (V6) Aging rate. The evaluation period took into

account the last five years as it is more recent data, thus providing a better evaluation of the current period.

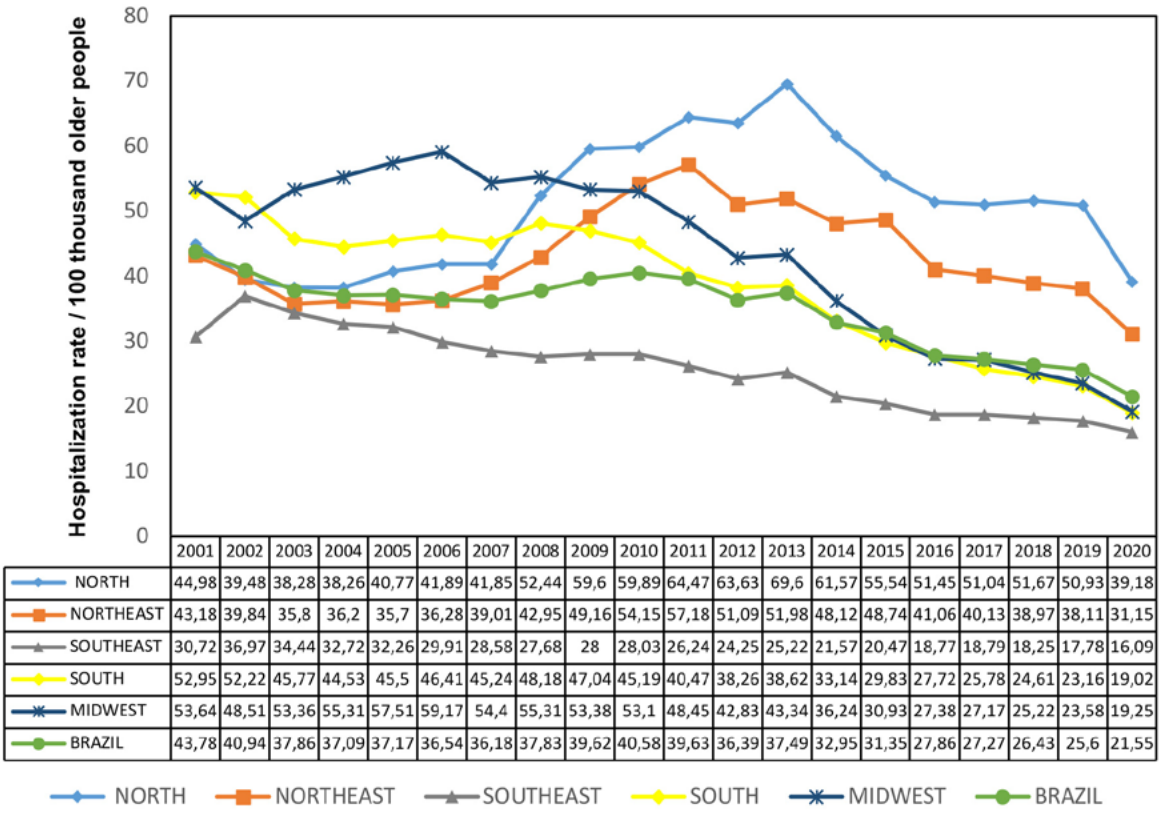
Finally, a multivariate analysis was performed, in which the *Skater* technique or regionalization method was applied, which allows for grouping smaller areas into larger areas that, in addition to being contiguous, also have similarities according to the associated attributes[16]. In this technique, all variables were standardized by Z score, using the formation of 5 clusters, in which we sought to analyze the spatial association between the average rate of hospitalization for DM in older people in the last five years (2016-2020) by RIAU and independent variables.

This research used secondary data available on official websites of the Ministry of Health of Brazil, being exempt from consideration by a research ethics committee, in accordance with Resolution 466/2012 of the National Health Council.

RESULTS

From 2001 to 2020, there were 1,445,497 hospital admissions for DM in older people aged 60 years or more in Brazil. The analysis of the annual rates of hospitalization for DM shows that Brazil registered a rate of 43.78 admissions/100,000 older people in 2001 and 21.55/100,000 older people in 2020 (Figure 01).

The Regions that presented the highest hospitalization rates over the years analyzed were the North Region (69.6/100,000 older people in 2013), Midwest Region (59.17/100,000 older people in 2006), Northeast Region (57.18 /100,000 older people in 2011) and the South Region (52.95/100,000 older people in 2001), all with values above the highest Brazilian rate (43.78/100,000 older people in 2001). The Southeast Region was the only one to present values lower than these (36.97/100,000 older people people in 2002) (Figure 1).



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
NORTH	44,98	39,48	38,28	38,26	40,77	41,89	41,85	52,44	59,6	59,89	64,47	63,63	69,6	61,57	55,54	51,45	51,04	51,67	50,93	39,18
NORTHEAST	43,18	39,84	35,8	36,2	35,7	36,28	39,01	42,95	49,16	54,15	57,18	51,09	51,98	48,12	48,74	41,06	40,13	38,97	38,11	31,15
SOUTHEAST	30,72	36,97	34,44	32,72	32,26	29,91	28,58	27,68	28	28,03	26,24	24,25	25,22	21,57	20,47	18,77	18,79	18,25	17,78	16,09
SOUTH	52,95	52,22	45,77	44,53	45,5	46,41	45,24	48,18	47,04	45,19	40,47	38,26	38,62	33,14	29,83	27,72	25,78	24,61	23,16	19,02
MIDWEST	53,64	48,51	53,36	55,31	57,51	59,17	54,4	55,31	53,38	53,1	48,45	42,83	43,34	36,24	30,93	27,38	27,17	25,22	23,58	19,25
BRAZIL	43,78	40,94	37,86	37,09	37,17	36,54	36,18	37,83	39,62	40,58	39,63	36,39	37,49	32,95	31,35	27,86	27,27	26,43	25,6	21,55

Figure 1. Temporal distribution of hospital admission rates in the SUS (per 100,000 older people) for DM in older people aged 60 years and over in Brazil and regions, 2001-2020. Source: SIH-SUS – DATASUS/MS.

In Brazil, from 2001 to 2020, the rates of hospitalizations for DM in older people showed a significant reduction trend (AAPC= -3.4% 95%CI -4.5; -2.3), with three points of change in the period (*joinpoints*). With emphasis on the periods of the first and third *joinpoints*, in which hospitalizations for DM in older people in Brazil decreased significantly each year (Table 1).

The Southeast, South and Midwest regions showed a trend towards a significant reduction in hospitalizations, but the Southeast Region (AAPC= -4.0% 95%CI -4.5; -3.5) did not show *joinpoints*.

For the North (AAPC= -0.0% 95%CI -2.0; 2.0) and Northeast (AAPC= -1.2% 95%CI -2.5; 0.2) regions, two joinpoints were formed, interspersing segments of significant increases and decreases (Table 1).

The spatial analysis of hospitalization rates showed strong spatial autocorrelation by Moran Global values only in the last five years (I<0.3). However, all maps showed the formation of RIAU clusters with high hospitalization rates.

In the first two five-year periods, the high-high *cluster* was concentrated in the Midwest region. In the last two five-year periods, the North and Northeast regions presented high-high *clusters* (Figure 2). Also noteworthy is the formation of *clusters* of low hospitalization rates (Low-Low) in the Southeast over all five-year periods, with a gradual increase in Low-Low aggregates over the years (Figure 2).

Table 1. Temporal trend in SUS admission rates for DM in older people aged 60 years and over for Brazil and large geographic regions, from 2001 to 2020.

Geographical area	Starting year	Final year	APC ($IC_{95\%}$)	*p*	AAPC ($IC_{95\%}$)	*p*
North region						
Seg. 1	2001	2004	-5.4 (-14.8; 5.1)	0.300	-0.0 (-2.0; 2.0)	1.0
Seg. 2	2004	2012	8.2* (5.2; 11.2)	<0.05		
Seg. 3	2012	2020	-5.7* (-7.8; -3.5)	<0.05		
Northeast region						
Seg. 1	2001	2005	-5.4* (-9.6; -1.0)	<0.05	-1.2 (-2.5; 0.2)	0.1
Seg. 2	2005	2011	9.3* (5.8; 12.8)	<0.05		
Seg. 3	2011	2020	-5.7* (-7.0; -4.5)	<0.05		
Southeast region						
Seg. 1	2001	2020	-4.0* (-4.0; -4.5)	<0.05	-4.0* (-4.5; -3.5)	<0.05
South region						
Seg. 1	2001	2004	-6.2* (-11.9; -0.2)	<0.05	-4.9* (-6.2; -3.6)	<0.05
Seg. 2	2004	2009	1.9 (-2.1; 6.0)	0.300		
Seg. 3	2009	2020	-7.6* (-8.3; -6.8)	<0.05		
Midwest region						
Seg. 1	2001	2009	1.2 (-0.5; 2.9)	0.200	-4.9* (-5.7; -4.0)	<0.05
Seg. 2	2009	2020	-9.0* (-10.0; -8.1)	<0.05		
Brazil						
Seg. 1	2001	2004	-6.1* (-11.4; -0.6)	<0.05	-3.4* (-4.5; -2.3)	<0.05
Seg. 2	2004	2011	1.5 (-0.4; 3.5)	0.100		
Seg. 3	2011	2020	-6.1* (-7.1; -5.1)	<0.05		

Seg.: Segment; APC: Anual Percentage Change; AAPC: Average Annual Percent Change; $IC_{95\%}$: 95% confidence interval; *APC is significantly different from zero at the alpha = 0.05 level. Source: SIH-SUS – DATASUS/MS.

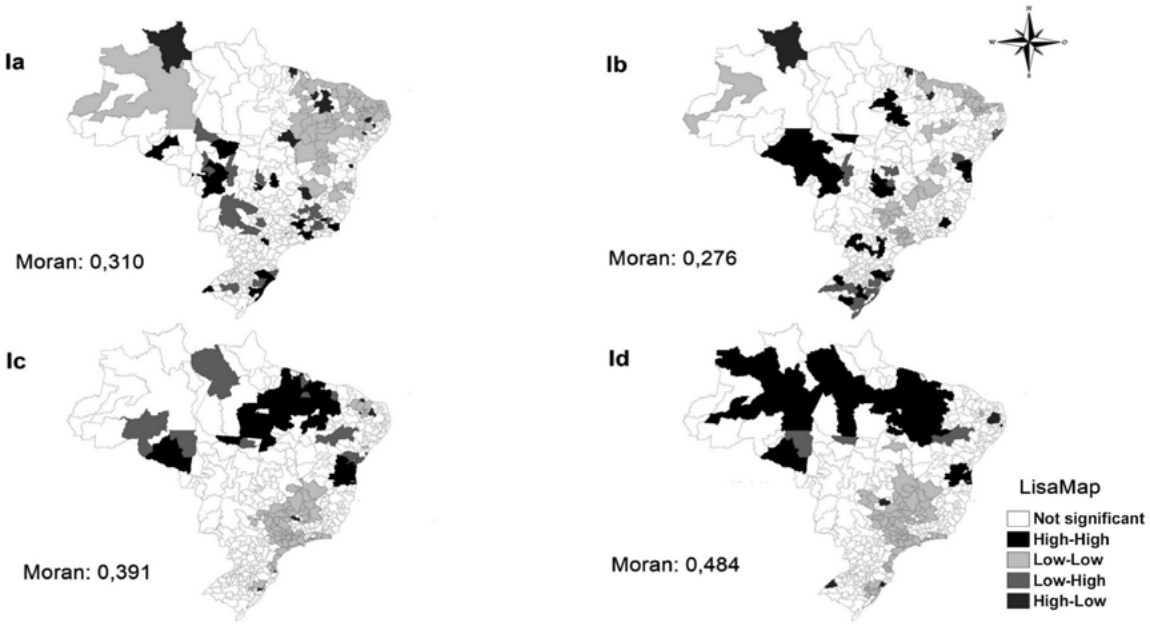


Figure 2. *LisaMap* and Moran Global values of hospitalization rates in the SUS (per 100,000 older people) for DM in older people (60 years or more) by RIAU in Brazil, 2001-2020. - Ia: 2001-2005; Ib: 2006-2010; Ic: 2011-2015; Id: 2016-2020.

Source: SIH-SUS – DATASUS/MS.

The bivariate spatial analysis (Figure 3) showed the formation of *clusters* with high rates of hospitalization for DM and a high percentage of FHS coverage in RIAUS in the states of Maranhão, Piauí, Paraíba and Southern Bahia (High-high). On the other hand, for the state of São Paulo and for the South Region, low rates of hospitalizations for DM and low percentages of FHS coverage (low-low) were pointed out.

Regarding the supply of nurses and doctors from the FHS, the formation of *clusters* with high rates of hospitalizations due to DM and a high supply of professionals from the FHS in a large part of the North Region and in some Northeastern states, specifically Maranhão, Piauí and Rio Grande do Norte (High-high). The North region also showed the formation of a High-high *cluster* when the hospitalizations with the indicator 'percentage of poor people' were analyzed (Figure 3).

For the MHDI, the graphs showed that the South, Southeast and Midwest regions concentrated the lowest rates of hospitalizations for DM and higher MHDI values (Low-high), however, there were small distributions of high percentages of hospitalizations and high MHDI in RIAU in the South Region, specifically in Maringá, Criciúma and São Miguel do Oeste (High-high). In the North region, there were high hospitalization rates and a low MHDI index (High-low) (Figure 3).

For the variable 'aging rate', it was possible to observe high rates of hospitalizations and low rates of population aging over a large area in the North Region (High-low). High rates of hospitalization and high rates of population aging were observed for the RIAU in the states of Rio Grande do Sul, Belo Horizonte and Paraíba (High-high) (Figure 3).

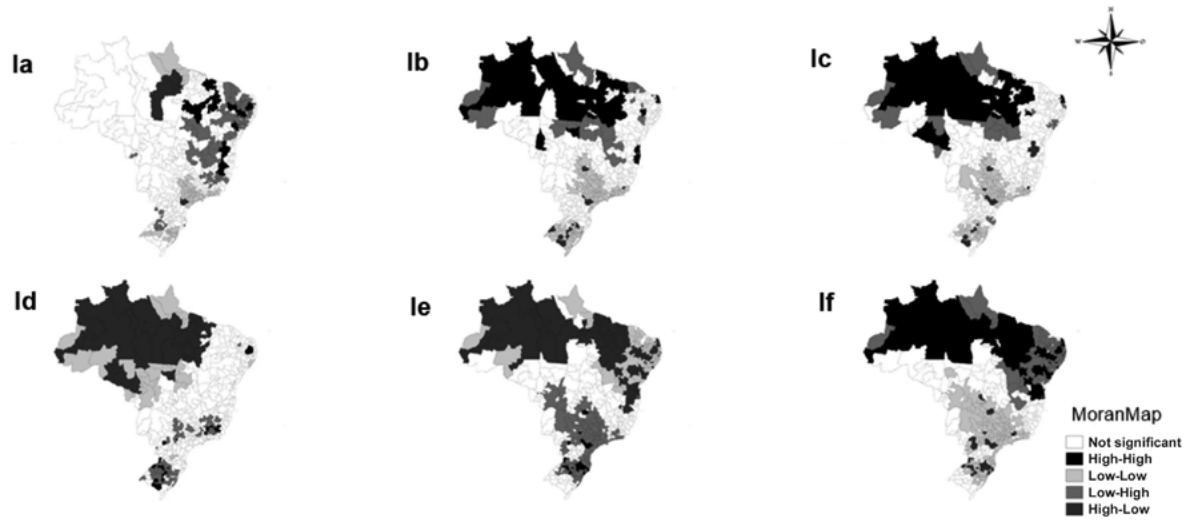
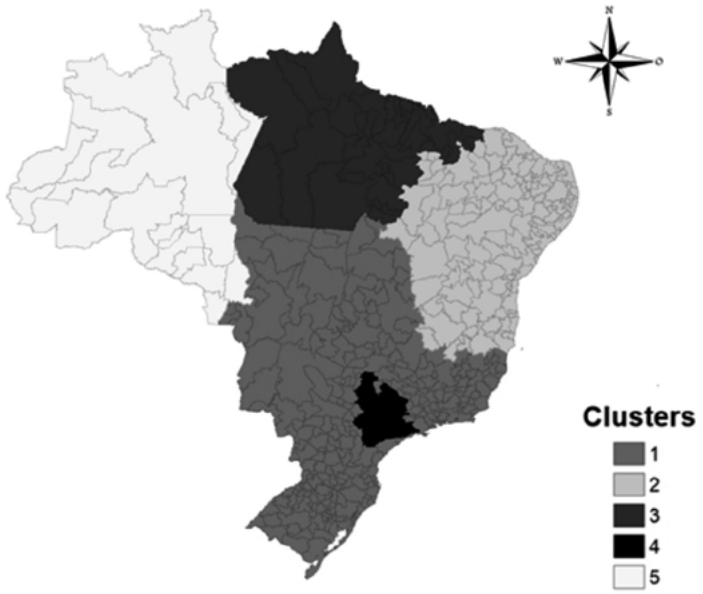


Figure 3. Bivariate *MoranMap* between the hospitalization rate for DM in older people (60 years old or more), social indicators and the supply of health services by RIAU in Brazil, 2016-2020. - Ia: Hospitalization x FHS Coverage; Ib: Hospitalization x Offer of Nurses; Ic: Hospitalization x Offer of Doctors; Id: Hospitalization x Aging; Ie: Hospitalization x MHDI; If: Hospitalization x Poor people.

Source: SIH-SUS – DATASUS/MS.

The analysis using the Skater technique (Figure 4) identified the C3 *cluster* composed mainly of states in the North Region (Amapá, Pará and Tocantins) and part of the state of Maranhão in the Northeast, with the characteristic high rates of hospitalizations for DM (Z=1.21) and the highest percentage of poor population (Z=1.24), second lowest rate of population aging (Z=-1.41), the lowest MHDI in the country (Z=-1.12) and lower coverage of the FHS (Z=-0.15). However, this *cluster* presents the second best offer of nurses and doctors in the FHS in Brazil (Figure 4).

There was also the formation of a C4 *cluster* comprising 29 RIAU in the state of São Paulo; this had the lowest rates of hospitalization for DM (Z=-0.76) while it had the worst indicators of offers of service and health professionals, with a low FHS coverage rate (Z=-2.47) and low supply of nurses and physicians (Z=-1.19 and Z=-1.14, respectively), however, this *cluster* was the one with the best MHDI index (Z=1.13), the lowest percentage of poor people (Z=1.02) and the second highest rate of population aging (Z=0.16) (Figure 4).



Cluster centers:

	TAX_INTER	COB_ESF	O_ENF	O_MED	IDHM	POBRES	ENVELHECIM
C1	-0.282912	0.0308621	-0.393321	-0.310357	0.61967	-0.661916	0.345268
C2	-0.259035	0.480239	0.509334	0.301096	-1.0042	1.01805	-0.0574569
C3	1.21854	-0.15268	1.08332	1.14007	-1.12828	1.24669	-1.41926
C4	-0.762532	-2.47278	-1.19207	-1.14874	1.13668	-1.02962	0.165222
C5	0.737386	0.13627	1.38668	1.64171	-0.551535	0.631277	-1.87616

Figure 4. Skater map for analysis of hospitalization patterns for DM in older people (60 years and over) and their relationship with social indicators and health service provision by RIAU in Brazil, 2016-2020.

Atlas of Human Development in Brazil of the United Nations Development Program (UNDP). Source: SIH-SUS – DATASUS/MS.

DISCUSSION

Despite the increasing propensities in the prevalence of DM in Brazil and worldwide[1,4], the results of the present study show that there has been a trend towards a reduction in hospitalizations for DM in older people aged ≥60 years in Brazil in the last 20 years.

Several factors can be related to explain this change, among them, in 2001, there was the implementation of the guidelines of the Plan for the Reorganization of Attention to Hypertension and Diabetes[17] which was the basis for organizing a Diabetes Detection Campaign at the national level, this aimed at mass testing of the population to detect individuals with DM in order to standardize services and train SUS professionals to meet this demand.

From the DM Detection Campaign, changes were induced in the monitoring and treatment of DM, improvements in the dispensing of medications, greater access to references to control complications, educational actions aimed at nutritional guidelines and physical activities[17].

Furthermore, it is observed that in the years that there were notable declines in hospitalizations in this study, they subsequently correspond to the periods of implementation of policies established by the Federal Government that aimed to improve the quality of life of older people in Brazil.

As an example of such policies instituted in the country, we can mention the formulation of the Older People Statute created in 2003 and the Pact for Health established in February 2006, both, respectively, aimed at ensuring social rights such as the assistance of a minimum wage for all older people who were on the poverty line, as well as maintaining the theme of aging as a fundamental discussion in the health area[18,19].

In concession to the formulation of the Pact for Health, in March 2006 there was a historic milestone in the strengthening of Primary Health Care (PHC) with the rise of the Family Health Strategy (FHS) by the National Primary Care Policy (NPCP), which was reformulated in 2017 and, in all stages of planning and implementation, the health of the older person was configured as one of the strategic areas for the performance of Primary Care[20].

It is worth noting that in the same year of this historic milestone in the Brazilian health system, in October 2006 the National Health Policy for the Older Person (NHPOP) was approved, which had plans for the healthy aging of the population[21].

Considering the reality of the Brazilian population aging and the combination of these policies to protect the health of older people, the PHC offers programs and actions that support users in this age group, corresponding to consultations with different specialties and multidimensional assessments guided by the Health Handbook of the Older Person; the Hiperdia Program, which aims to prevent and control CNCDs such as Hypertension and Diabetes; Home Care Program; Among other education and health actions[18-22].

In this context, the FHS is a privileged space for comprehensive health care for the older person, in which the effective insertion of these users in Health Units, with the combination of these population protection policies, may be directly contributing to the reduction of hospitalizations for preventable causes throughout Brazil, such as DM.

Another important demonstration of this study (Table 1 and Figure 2) is that although a trend towards a reduction in hospitalizations of older people in Brazil caused by DM was evidenced, the high rates of hospitalizations that still prevail are unevenly distributed among the major regions of the country. While in the Midwest, South and Southeast, the hospitalization rates for DM are decreasing, in the North and Northeast there is a slow tendency to decrease.

According to Pagotto[23], the high prevalence of hospitalizations and associated factors are mainly related to economic and social issues. The results of the bivariate and multivariate analysis (Figure 3 and Figure 4) of this study corroborate this finding, since when comparing the hospitalization rate with social indicators, such as the percentage of poor people and the MHDI, the North and Northeast, in addition to concentrating the highest rates of hospitalizations, being substantially notorious in the last five-year periods analyzed, they also presented greater vulnerabilities among all regions of the country, recording high rates of hospitalizations with a high percentage of poor people and low MHDI in the periods analyzed.

Other surveys have also found similar values of these indicators for both regions and claim that there are social and economic gaps between the North/Northeast and the rest of the country, understanding that these are factors that negatively affect the health conditions of these populations[24-26].

When we sought to assess the association between population aging and the hospitalization rate in this study, the results also showed the lowest aging rate in the country for the North and Northeast regions. In accordance with the data from this study, a survey that sought to understand the reasons for the declines in life expectancy of the population in different countries[27] found that social inequality, poverty and low quality of health care were determinants that contributed to the decrease in longevity in individuals over 65 years of age among all countries analyzed.

When the hospitalization rates and FHS coverage were investigated, it was identified that in the North, despite the high hospitalization rates, there was no *cluster* formation with FHS coverage in a large extent of the region. Soares[28] states in his study that the structuring of FHS in the North is unfavorable

and insufficient, and this is due to the deployment of teams in places outside its coverage area, which denotes a weakness in the service and makes it difficult for the user to bond with the health unit.

North and Northeast stood out with the largest supply of nurses and doctors at FHS, when compared to the others. This finding can be attributed to the implementation of the *Mais Médicos* Program (PMM), which was an emergency provision in the call for doctors to compose the FHS in territories with a shortage of this professional class. In 2018, more than 18,000 doctors were integrated into the PHC workforce, with the Northeast being one of the most favored regions with the program, which denotes an attempt to exercise equity in health by government entities, as these regions present remarkable socioeconomic vulnerabilities in its population[29,30].

Finally, we can highlight the most favorable scenario for the Midwest, South and especially the Southeast regions, which generally had the lowest rates of hospitalizations with a constant reduction in these rates and presented the best indicators of socioeconomic conditions and greater aging of the population.

Studies explain that the trend of these indicators for these regions is associated with the concentration of wealth and resources, reflecting in a good state of health and quality of life in these regions, especially in the state of São Paulo, which is characterized as the most rich in the country and where there is the highest percentage of older people with income above five minimum wages[31-33].

Despite the low FHS coverage rates and the offer of professionals, especially in São Paulo, Oliveira[34] reports in his study that these macro-regions have greater geographic accessibility to low, medium and high complexity care services, allowing greater chances of using such services and, consequently, better prevention of health problems.

Added to this factor, São Paulo is one of the cities with the greatest coverage of beneficiaries of private health plans in Brazil[35], which raises the hypothesis that there may be more hospitalizations of older people caused by DM in the capital, however, they are not paid for by the SUS.

Finally, the spatial behavior of DM, the geographic and cultural complexities and the disparities in socioeconomic conditions of life reinforce the need to produce information that collaborate to formulate strategies to reduce morbidity in this population.

However, as it is an ecological approach, the study has limitations inherent to its methodology, being subject to the bias of underreporting. Despite these limitations, this study is relevant for the survey of priority areas for the development of actions to prevent DM and other chronic diseases associated with it.

CONCLUSION

Even if slowly, the expansion of government policies to protect the health of the older person marked a national commitment to the healthy aging of the population, this can be observed through the positive results, with the decline in hospitalization rates for DM in older people aged 60 years and over in Brazil in the last 20 years.

However, there are still regional disparities in hospital admission rates, which are strictly related to socioeconomic and care inequalities in the Brazilian territory resulting from historical legacies that demarcate the political and economic makeup of the country.

In this context, the findings are important data because they are strong indicators for the development and redirection of new public policies that aim to minimize this process of inequalities in Brazil and improve existing strategies in PHC for the prevention and control of DM in older people, especially in regions with high hospitalization rates.

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Constitution of autonomy discourse of older person in the daily life of a Long-Term Care Facility for the older person

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Abstract

Objective: to analyze the constitution of autonomy discourse of the older personin a Long-Term Institution, from the perspective of professionals and institutionalized older person women. *Method:* qualitative research, developed from the perspective of the post-structuralist framework, fulfilled in a philanthropicinstitution in the city of Belo Horizonte, Minas Gerais, Brazil. Data were collected, from January to March 2018, through semi-structured interviews with 13 professionalsand seven older person women, document analysis and observation and were submitted to discourse analysis. *Results:* the effects of institutionalization on theconstitution of the older person's autonomy can be observed in the speeches of the older person and professionals. The Institution is a place of discipline, with well-established routines, with little space for older person women to make decisions. Their autonomy is forgotten, because routines, in a way, cover up their desires, their choices and their own freedom. *Conclusion:* for a proper functioningof the structure, limits and rules are necessary. However, it is important to consider that the standards are not used solely as an instrument for controlling and restricting the older person women's decision-making exercise. The epidemiological transition requires from institutions changes in their daily practices, arising from specific public policies for institutions, with a clear definition of their role and guidelines for a qualified practice.

Keywords: Elderly. Home for the Aged. Personal autonomy. Institutionalization. Aging.

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INTRODUCTION

Brazilian public health policies privilege the permanence and care of the older person at home, as a way to promote health, prevent disabilities and maintain the functional capacity of the dependent older person[1]. However, with the changes in society and in the family structure, this care, previously restricted to the family nucleus, particularly to women, has taken on a different profile, given the demands of the market and the expansion of women's participation in the labor market[2].

In this context, the institutionalization of the older person becomes an alternative to be considered, with a consequent increase in the demand for places in Long Term Care Facilities for the Older Person (LTCFs).

Historically, these places are recognized as places of isolation, social and generational segregation, in which individuals are deprived of freedom[3]. Institutions of this nature make up the list of total institutions, that is, institutions that serve as residence for a certain number of individuals in a similar situation, for a considerable period of time, during which they are separated from society in general and lead a confined lifetime[4]. Total institutions are oppressive environments, where the recluded have their daily lives largely controlled, with their autonomy being weakened[5].

Autonomy, a central component of the general well-being of the older person, is strongly anchored in meeting the basic needs of an individual, influencing their dignity, integrity, freedom and independence[6]. Even in the face of a variety of conceptual issues, in general, theories about autonomy converge in two essential conditions: freedom, which refers to the independence of controlling influences, and agency, which is the ability to act intentionally[7].

Autonomy refers to the issue of the subject's relationship with the other and constitutes the tension between the established society and the instituting society, so that the idea of autonomy can only be conceived in the analysis of the historical and social process[8]. In this sense, the context of population aging should lead us to reflections on this process, which encompasses issues related to autonomy within the institutionalization of the older person, as it is estimated that 1% of Brazilians over 60 years of age reside in LTCFs[9].

Older people may have their autonomy restricted with institutionalization, since the routines imposed in this scenario are factors that may be associated with the possibility of reducing the exercise of their own will[9]. This justifies the relevance of investigating, from different perspectives, the constitution of the discourse of autonomy of institutionalized older people. Thus, this article aimed to analyze the constitution of the discourse of autonomy of older people in a Long-Term Facility, from the perspective of professionals and institutionalized older women.

METHOD

The present study is a qualitative research, which uses post-structuralism as a theoretical-philosophical framework. Qualitative research delves into the intensity, uniqueness and meaning of things, in a cycle that does not close, as all research produces knowledge and generates new questions[10]. These questions are interconnected with the perspective of post-structuralism, since its foundation is to question reality itself, who are the individuals who constitute it and what social relations are established in a given scenario[11]. In addition, post-structuralism allows for a reflection on the concepts used by society, which are not accepted as universal truths, but rather as a result of changes in power relations[12].

The research was carried out in a philanthropic LTCF in the city of Belo Horizonte, Minas Gerais (MG), Brazil, where only women reside. Two previous visits were made to the institution so that it was selected as a research field. This fact was due to the institution's interest in the topic to be addressed by the research.

The Institution has a capacity for 30 older women and, at the time of data collection, it had 28 institutionalized women, aged between 60 and 93 years. The multidisciplinary team responsible for the care of these older women was composed of: a nurse, four nursing technicians, six caregivers, a physician, a social worker and a psychologist. Research participants were informed about the institutional affiliation of the researchers to a Federal

University of Minas Gerais and about the topic of the research they proposed to develop at the ILPI.

Study participants were institutionalized older women and professionals involved in daily care. Inclusion criteria for the older women were: being 60 years old or older, residing in the institution for at least three months, having verbal fluency that allowed dialogue and having a result of the Mini Mental State Examination with a score of 20 for illiterate people, 25 for people with one to four years of education, 26.5 for those with five to eight years of education, 28 for individuals who studied from nine to 11 years and 29 for those with more than 11 years of education[13]. The inclusion criteria for the professionals were: being a professional involved in the daily care of the older women, working at the institution for at least three months, excluding workers exclusively involved in administrative activities and those in general services.

To define the sample, the criterion of data saturation was used, that is, the inclusion of participants was interrupted when it no longer led to obtaining new information[14] on the constitution of the discourse of autonomy of institutionalized older women. Thus, saturation was achieved with the participation of seven older women and 13 professionals.

The age of the older women participants ranged from 71 to 92 years, with institutionalization time from one to 13 years. As for education, three had not completed elementary school, one had completed elementary school, two had completed high school and one had higher education. Of the professionals, 12 were women and one man, aged from 26 to 65 years old and working at the institution between one and 30 years. Five had higher education and eight medium level.

The research team consisted of a researcher with a doctorate in Nursing, a master's student in progress, and a nursing student in a scientific initiation program, who was guided and supervised by the nurses in all activities of which she participated.

Data collection took place from January to March 2018, through semi-structured interviews, with an average duration of 15 minutes, in addition to field observation. At first, the interviews were conducted by the master's researcher, together with the nursing student. Both were trained by the researcher PhD in Nursing on the technique of conducting the interviews.

The establishment of *rapport* aims at welcoming the researched, so that they feel confident and favor their participation in the research[15]. The technique was applied by the researchers to respectfully approach the older women and professionals, in a reserved and welcoming environment.

The older women and professionals were approached to conduct the interview during visits to the Institution, with a day and time being scheduled in advance. One older woman gave up on participating in the research and one professional was excluded for working at the institution for less than three months.

The older women's interview script contained the following guiding questions: 1) Where did you live before coming to this Institution? 2) Whose decision was it for you to come live here? Why? 3) Do you feel able to make decisions about the things you need to do on a daily basis? Why?

In the professionals' script, the questions were: 1) What is it like for you to work in an LTCF? 2) How is your daily work at the Institution? 3) Do you consider that the seniors of this LTCF are able to make decisions about the things they need to do in their day-to-day? Why?

The interviews were carried out individually, in a reserved environment at the LTCF, with the presence of the researchers and the interviewee. They were recorded in a Media Player equipment and later transcribed by the master's nurse and by the undergraduate student. For observation, visits were made three to five times a week during the period of data collection, being recorded in a field diary. The field diary was filled out during the interviews and concomitantly with the observation of the researchers. The observation included weekends, alternating the periods of morning, afternoon and evening, until approximately 8:00 pm.

For analysis purposes, all collected material was treated as text. The interviews were transcribed in Microsoft Word, converting them into narrative texts, and the field notes constituted texts of observation of the daily practices of the LTCF.

Data were submitted to discourse analysis (DA), which focuses on language and its use[16], which was used in this study to explore the constitution of the discourse of autonomy of the older women. Discourses are formed by elements that do not present a principle of unity, and it is up to the DA to seek the rules that are capable of governing its formation, which enables the determination of the elements that make up the discourse[17]. The emphasis of DA is the analysis of the internal knowledge of the practice of a given society, which is expressed through its language, understanding that speeches and texts are social practices[18].

In the constitution of their speeches, the subjects elaborate a repertoire of discursive resources with different strategies. Such descriptions are not limited to mere reports of a scene, thing or person, but are oriented towards the action that constitutes them and, therefore, contribute to creating the realities experienced by people[16]. The associations and analyzes performed involved the interpretation of texts based on the data and their implicit meaning, based on the post-structuralist framework[19].

The first stage of the analysis consisted of the repeated and exhaustive reading of the texts produced from the data by the researchers involved in the investigation. From then on, discussions with the research team allowed the progression and development of data analysis, identifying and separating relevant discursive structures in the texts, capable of expanding the understanding of the autonomy of the older women. Thus, the categorization of elements with common characteristics was carried out, grouping elements, ideas or expressions around a concept.

Although different themes were found in the data analysis, this article only addresses the constitution of the institutionalized older women's autonomy discourse. Soon after data collection, the importance of the research results was discussed with the LTCF manager at the time and with some participants. The results will be presented to the other participants and, dialogically, they will be able to allow reflections on the autonomy of the institutionalized older person in LTCFs.

According to the precepts of Resolution No. 466/2012, the project was approved by the Ethics and Research Committee of the Federal University of Minas Gerais, under Opinion Nº. 2.470.752/2018. The confidentiality of information and the identity of the participants was maintained. Thus, the professionals were identified in the research results by the letter P and the older women by the letter I and numbered according to the sequence of interviews. All participants signed the Informed Consent Form.

RESULTS

Data analysis showed that, although professionals report respecting the wishes of the older women, institutional routines, in a way, define and naturalize the behavior of residents in the institution.

> "If you sit her down watching a program, then she will stay. Unless she starts to bother you, that is, something that wasn't her habit or she doesn't like it. She will signal and we will withdraw her from that environment. But most follow the institutional routine without complaining, without considering, because they're used to being that way" (P4). "[...] I have breakfast before tidying my room. I have breakfast, clean the room, take a shower [...]" (I2).

The LTCF is a place of routines, where activities are repeated day after day. Every day, dependent older women are grouped in certain environments, such as the TV room or the area close to the cafeteria. The times in common environments are predetermined, thus establishing control over the use of spaces, which creates a pattern of behavior and allows for better knowledge of the location of the older women:

> "Of course, being an institution, there are routines, right?! At home, you can see that most older women do not stay in bed. Unless they're feeling indisposed, right?!" (P12). "Look, my daily life here is twenty-four hours in bed, because I had thrombosis in my right leg [...] my daily life is in bed." (I5)

The times for most daily activities are well defined. The older women should be ready for breakfast at 7:30 am, so showers start at 6 am. From 8 am to 10 am they watch TV, lunch is served at 11 am, in the afternoon they watch TV again and, finally, dinner is served at 5 pm. The daily routine ends at 6 pm, when the older women, especially dependents, are placed in their beds to sleep.

The visits to the institution took place between January and March, the vacation period for students who carry out activities there. Among them are physiotherapy, medical research, a group of singers and clowns, classes with a physical educator. However, during this period, the place was quieter and more empty, which highlighted the routine of everyday life.

> "Well, there's a time for everything here! Everything! [...] when the soap opera is almost finished, I'm already making the bed to sleep [...] when it comes to dinner for the residents at 5 pm, I go down and get some soup or milk to drink at night" (I2).

In this context of such well-established routines, there is little room for decision-making by the older women. Their autonomy is forgotten in routines that, in a way, hide their desires, their choices and their own freedom, as the professional points out:

> "Is it possible, one day, for one not to want a certain food and to eat another food? Yes, it's possible! So, while this is not a problem for us, we will do it. It will be a problem the day that several... have different desires. Then, I think it homogenizes it, there is no way. In collectivity you can't think about each one all the time..." (P7).

The professional's discourse points to the Institution's limited flexibility in relation to the particular wishes of the older women, recognizing the supremacy of the collectivity over individuality. However, even in the face of a list of rules and norms established in the daily life of the LTCF, obedience to them is not always perceived by the older women as a form of curtailing their autonomy.

> "I don't really like going out, no. But if I want to, I decide I want to go: "Sister, I want to go to such a place. Can I?" "You can." And I will, got it!? So, like that, we have freedom, you know?" (I3). "[...] there are things we have to [...] talk to the coordinator! What are you going to do and such, right?! But, for me, the decision, I know how to make. But, as I live here, then, we have to obey, right?! To render account" (I4).

The discourse shows that the power of the norm and regulation is exercised over them, leading them to submit to the established rules. In addition, the older women have their lives determined by institutional norms according to their degree of dependence:

> "There are older women who like to take a shower at 4 am, 5 am, but there are older women who want to take a shower more throughout the day. If she is independent, she has no problem, but if she depends on the caregivers, she will have up to 9 o'clock to take a shower" (P12). "In every social group there must be norms and limits. So, then, we can't give this full right of choice, can we?! So, some have all the independence they want, we don't arrest them or anything. But others don't. So, it is the minority that has their independence and autonomy" (P11). "I think it's great, you know, because if I had been so dependent, I don't think it would be that good, lol" (I3).

It is also observed that the autonomy of older women is put into question according to intellectual and cognitive limitations that prevent them from managing their own finances and their lives:

> "They don't have any autonomy. They are thus totally knowledgeless and lay. Many are illiterate [...] There is one with a mental disability. There is already a part of their intellectual... so compromised. They have no management. They don't know, they can't manage the financial part." (P8)

However, it is worth considering that, not always, submission to the rules takes place in a passive way, raising a subtle expression of resistance to institutional rules, certain attempts to escape the established control:

> "[...] she really likes standing there at the edge of the gate. Then you go with patience: "So and so, let's go!" And she goes: "No!" Then there are times that, or it goes in a spurt, "Let's go!" or, if not, you have to come and say really angry "So-and-so, let's get out of there?!" (P2). "So it gets a little bit painful, when they get here, it's hard to adapt, right?! They keep wanting to leave, wanting to run away." (I3)

The speeches show a form of resistance of the older women to institutional norms. The desire to run away or to see people walking in the streets, or even the desire to see life outside the Institution's walls, makes her stay close to the gate in the expectation that an opportunity to escape will arise.

DISCUSSION

Autonomy is defined as the right to make decisions, think, decide and act, in view of one's own beliefs and values, based on what is believed to be the best for oneself[20]. In institutions, in general, it is challenging for the team to promote the autonomy of the older person. Professional paternalism, when the professional starts to make decisions for the older person in order to benefit them, is one of the attitudes that can compromise the autonomy of the institutionalized person[21].

A study carried out with nurses on the perception of the older person's autonomy at the end of life showed that, for professionals, older people have the right to autonomy, including the power to decide about their life, however, this autonomy can be conditioned to certain factors , such as diseases and level of cognition to make decisions[22]. In addition, professionals mistakenly relate childhood to old age, disregarding the entire life story of the older person, as if they were not competent to manage it[21].

In doing so, they use the institution's disciplinary norms and rules as a means of superimposing their truths on those of the older people.

The disciplinary power, in the institutional context, acts silently and subtly, training bodies so that they become docile[17]. If, on the one hand, autonomy is exercised within spatial boundaries, discipline is exercised over the bodies of individuals, with the power to affect subjects capable of voluntary actions[23]. At the LTCF, through hierarchical power relations, norms are established with a view to serving the community to ensure the continuity of the daily work dynamics. Although these norms are not designed with the intention of restricting the individual autonomy of the older women, they end up delineating their decision-making limit. Thus, an institutionalization model is formed that is loaded with control, discipline, division and homogenization[23].

The countless rules and routines homogenize life, in a daily routine in which discipline prevails, with control over the lives of the older women and the consequent decrease in their autonomy[24]. Independent older women are confined to their rooms or, with consent, can leave the LTCF, while dependente ones stay in the television rooms on their respective dormitory floors. Although the independent older women have the possibility of choice, they also end up adapting to the norms and their autonomy is forgotten inside each room.

Homogenizing the daily lives of the older women makes the organization of demands for caregivers less complex, reducing the space for will and desire. In this sense, it is important to consider that behaviors that really increase the subjects' autonomy are based on meaningful choices for them, which involves questioning the other about trivial issues and paying attention to small details[24].

In a study carried out in Mexico with more than a thousand older people, with the aim of evaluating the perception of the older people themselves about their autonomy, it was identified that even older people with cognitive impairment can coherently answer questions about preferences, choices and their participation in decisions about daily life, providing accurate and reliable information. The results also indicated that cognitive impairment is associated with a low perception of autonomy, which can lead to high levels of anxiety, depression and loss of independence[25].

During the research data collection, the LTCF regiment was in the final phase of elaboration by the coordination, together with the care team.

However, even though, at that time, there was no formal regulation of institutional norms, the rules and routines were implicitly placed, being known to both residents and professionals.

On the other hand, it is clear that, from the perspective of professionals, the autonomy of older women is not always recognized, due to the fact that they no longer have management and knowledge. Power produces knowledge and vice-versa, with the power/knowledge binomial being directly related, so that there is no power relationship without the parallel of a field of knowledge, nor knowledge that does not constitute power relations[23]. The team's power over the older women's daily lives was incorporated in the organization, being institutionalized in the predominant structures and constantly recaptured[26].

Finally, it should be noted that for every exercise of power, there is, on the other hand, the cost to be paid for it, that is, a resistance to the instituted power. The institutional space, due to its countless rules, routines, hierarchical relationships, with consequent restriction of autonomy, provokes expressions of resistance represented by dissatisfaction, disagreement and invention of their own and imaginary spaces. In this context, the subject finds his subjectivation possibilities and builds resistance or subversion strategies to the social orders that limit them, which are represented by acts of freedom[27]. The older women's resistance strategies occur during times of escape, which made the institution install gates and cameras everywhere.

Among the limitations of the research, the fact that it was carried out in only one LTCF stands out. However, it is expected that this study can contribute to the reflection of a dignified old age, as older people continue to be segregated and excluded from living in the society. The asylum logic is maintained, instead of inserting them into the community and making them active and autonomous.

Thus, it emphasizes the importance and need for new studies that broaden the view on the autonomy of institutionalized older people and encompass the perspective of more heterogeneous groups.

CONCLUSION

The research results indicate that, for a proper functioning of the structure composed of different people who reside and work in this environment, limits and rules are necessary. However, despite the LTCF being an institution governed by norms, it is important to consider that norms are not primarily used as an instrument for controlling and restricting the decision-making exercise of older women.

The epidemiological transition has accelerated the transformation of society's relationship with the LTCFs, as well as requiring these institutions to change their daily practices. The ideology, physical structure and organization of the environment of an LTCF, as well as professional practice, work as a plot that reinforces dependence and undermines the autonomy of the older person, emerging from the discourses of professionals and older women.

However, it is necessary to advance more with regard to specific public policies for LTCFs, with a clear definition of their role and guidelines for a qualified practice. The financing of LTCFs also deserves attention from the public authorities, so that it is possible to enable their proper functioning, physical structure capable of meeting the demands of the older person, as well as providing a properly qualified professional body.

There is still limited knowledge about these practices and their effects on the lives of older people who live the reality of institutionalization, including with regard to their autonomy. Thus, it is expected that this study can contribute to reflections on issues involving the maintenance and expansion of the older person's autonomy in the institutional routine.

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Depressive symptoms and physical frailty in the older adults: an integrative review

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Abstract

Objective: to identify the relationship between depressive symptoms and physical frailty in the older adults through an integrative literature review. *Method:* searches were performed in portals and databases: Virtual Health Library, SciELO, Web of Science and PUBMED. The inclusion criteria were having been published in the period from 2012 to 2020, to appear in full, to be directly related to the theme and registered in Portuguese and/or English. To categorize the articles included in the study, the following information was extracted: author(s) and year, type of study and sample, objective(s) and main results. To illustrate selection of articles, the flowchart of the Preferred Reporting Items for Systematic Reviews and Meta-analyses were used, the Oxford Centre for Evidence-Based Medicine to classify the level of evidence and the EndNote Web for managing the bibliography. *Results:* of the 486 articles found, 126 were excluded due to duplication, 339 did not meet the pre-established criteria, and 21 articles that made up the review corpus. There was an association between depressive symptoms and physical frailty in the older adults, with the ability to be predictors of each other, being related to negative outcomes for the health of the older adults, among them: cognitive impairment, limited activities, increased mortality, among others. *Conclusion:* depressive symptoms and physical frailty are present among the older adults, with a reciprocal association, negatively influencing their clinical condition. The results help to clarify these conditions and provide knowledge for the prevention and development of interventions in the gerontological area, benefiting the health of the older adults.

Keywords: Depression. Frailty. Frail Elderly. Health of the Elderly. Geriatrics.

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INTRODUCTION

Frailty among older people is considered a priority in public health, as its presence predicts the occurrence of adverse events that threaten the long-term sustainability of health actions and systems[1]. In addition, it has a negative influence on the quality of life of the older person[2].

Physical frailty is defined as "a clinical condition in which there is an increase in an individual's vulnerability to the development of dependence and/or increased mortality when exposed to a stressor"[3]. It can be assessed from the frailty phenotype[4], which is composed of five biological markers: unintentional weight loss, self-reported fatigue/exhaustion, decreased handgrip strength, decreased physical activity level, and reduced gait speed. The older person with three or more of these markers is classified as frail, one or two pre-frail and no marker, not frail[4].

The condition of physical frailty is prevalent in older people[4,5] and has been a frequent topic of research due to its impacting effects on the vulnerability of older people, which lead to a cascade of negative health outcomes. The reduction in quality of life, reduction in basic activities of daily living (BADL), physical limitations, social isolation, hospitalization, increased morbidity and mortality are highlighted[6].

The presence of physical frailty in older people generates a state of alert for health professionals, due to the older person's predisposition to vulnerability and, consequently, physical and functional decline. It is associated with the presence of other geriatric conditions, such as depressive symptoms[7]. Special attention should be directed to frail older people for the onset of depressive symptoms[8,9].

Although it is widely recognized, so far there is no established definition for depressive symptoms, depressive symptomatology subtly manifests itself with dysphoria and somatic symptoms, being often associated with traces of depression[10].

Depressive symptoms predict the same adverse outcomes of physical frailty in older people and share somatic symptoms and risk factors such as sedentary lifestyle, weight loss, fatigue and low level of physical activity[11].

A cross-sectional descriptive study conducted by the Frailty Network for Older Brazilians (FIBRA), with 2,402 older people residents of seven Brazilian cities, identified a significant association between the prevalence of depression and physical frailty markers. Among them, unintentional weight loss, reduced gait speed and fatigue/exhaustion stand out[12].

However, contrasting the findings of the *op.cit.* study, an observational research carried out in India with 165 older people (≥60 years old), it identified that although a third of the participants, 54 (32.7%) had depression and 64 (38.8%) physical frailty, there was no significant association between them[13].

It is observed that the relationship between depressive symptoms and physical frailty in older people is still not fully clarified, configuring a scientific gap. Considering the current and relevant theme, the integrative literature review can clarify and present scientific knowledge to understand the factors that contribute to the etiology and prognosis of these syndromes, as well as contribute to the improvement of gerontological care actions.

Given the above, this study aims to identify the relationship between depressive symptoms and physical frailty in older people through an integrative literature review.

METHOD

It is an integrative literature review, which generates new knowledge on a given topic, reviewing, criticizing and synthesizing representative literature, in an integrated manner, so that new structures and perspectives are generated[14].

The review followed six steps[15]: 1-Theme identification and selection of the research question; 2-Establishment of inclusion/exclusion criteria, search and selection of literature; 3-Characterization of studies; 4-Assessment of studies included in the integrative review; 5-Interpretation of results; 6-Synthesis of knowledge or presentation of the review.

In the first stage, the relationship between depressive symptoms and physical frailty in older people was identified as a problem. To construct

the research question, the PICO strategy was used, so that the letter P corresponds to the population (older people), I for interest (depressive symptoms and physical frailty), C for comparison (any comparison) and O for outcomes (relationship). Given the above, the following question was structured: *What is the relationship between depressive symptoms and physical frailty in older people?*

In the second stage, the following inclusion criteria were established for the articles: having been published from January 2012 (the year when the term physical frailty was created) to May 2020; appearing as articles available in full and directly related to the topic; being in Portuguese and/or English.

The following were defined as exclusion criteria for articles: appearing as an editorial, review, experience report, theoretical reflection, dissertation, thesis, monograph, letter, summary of proceedings and events; review articles and those that did not answer the research question.

Searches were performed in portals and electronic databases covering studies/research in the health area: *National Library of Medicine* and *National Institutes of Health* (NCBI/PUBMED), *Web of Science, Virtual Health Library* (VHL) and *Scientific Electronic Library Online* (SciELO).

Search strategies were used in Portuguese and English, which were developed from the application of "*Descriptors in Health Sciences*" (DeCS), "*Medical Subject Headings*" (MeSH) and keywords. To obtain the largest number of articles, combinations between the descriptors were used, with the help of the Boolean operators "OR" and "AND" with the following terms: "*Frail Elderly*" AND ("*Depression*" OR "*Depressive Symptoms*").

Searches for studies, selection, extraction and analysis of data were carried out by two researchers independently. Aiming to reduce possible errors in the search, evaluation, analysis and interpretation of the studies in view of the doubts that arose from the review process, a third researcher was consulted to resolve them.

The management of the bibliography found for the selection of articles included in the corpus of the integrative review was carried out through the computer program *EndNote*®, which helped in the exclusion of duplicate studies, keeping only the first version found. To illustrate the selection of articles in the integrative review corpus, the flowchart of *Preferred Reporting Items for Systematic Reviews and Metaanalyses* (PRISMA)[16] (Figure 1) was used in the results.

In the third stage, the information extracted from the articles included in the study was categorized according to: author(s)/year of publication, type of study/sample, objective, and main results (Table 1).

In the fourth stage, the articles included in the study were analyzed in detail in the search for explanations and results, through recurrent reading. Subsequently, the studies were classified according to the level of evidence (Table 1) based on the classification proposed by the *Oxford Center for Evidence-Based Medicine* (2009)[17], consisting of five hierarchical levels of evidence by type of study, which can be visualized in Chart 1.

The fifth stage was designed with the interpretation of results, thus helping to discuss the relevant data from the studies. The sixth stage was completed with the presentation of the review/synthesis of knowledge. These steps were interpreted and presented in a narrative way.

This integrative review ensured the ethical aspects, ensuring respect for copyright, for citation we used the Vancouver standards and authors' references.

RESULTS

The initial search in the databases resulted in 486 articles. Of these, 126 duplicate studies were excluded, and 360 studies were selected for the general evaluation, of which 303 were excluded after reading the title and/or abstract because they were not related to the topic. Thus, 57 complete articles were evaluated for eligibility criteria, 36 of which were excluded after reading in full for not answering the research question, leaving 21 articles that presented the eligibility characteristics for inclusion in this review. Figure 1 shows a flowchart of the selection of articles from identification to inclusion in the corpus of the integrative review.

Chart 1. Levels of Evidence by Study Type. Curitiba, PR, 2020.

Levels of Evidence	Types of studies
1 a	Systematic review (with homogeneity) of randomized controlled clinical trials (ECCR).
1 b	ECCR with a narrow confidence interval (CI).
1 c	Therapeutic results of the "all or nothing" type.
2 a	Systematic review (with homogeneity) of cohort studies.
2 b	Individual cohort study (including lower quality ECCR, eg, follow-up below 80%).
2 c	Research results (observation of therapeutic results or clinical evolution); Ecological studies.
3 a	Systematic review (with homogeneity) of case-control studies.
3 b	Individual case-control study.
4	Case reports (including lower quality cohort or case-control).
5	Expert opinion without explicit critical appraisal, physiology studies, bench research and "*first principles*".

Source: Translated and adapted from the classification of the *Oxford Centre Evidence-Based Medicine* (2009)[17]

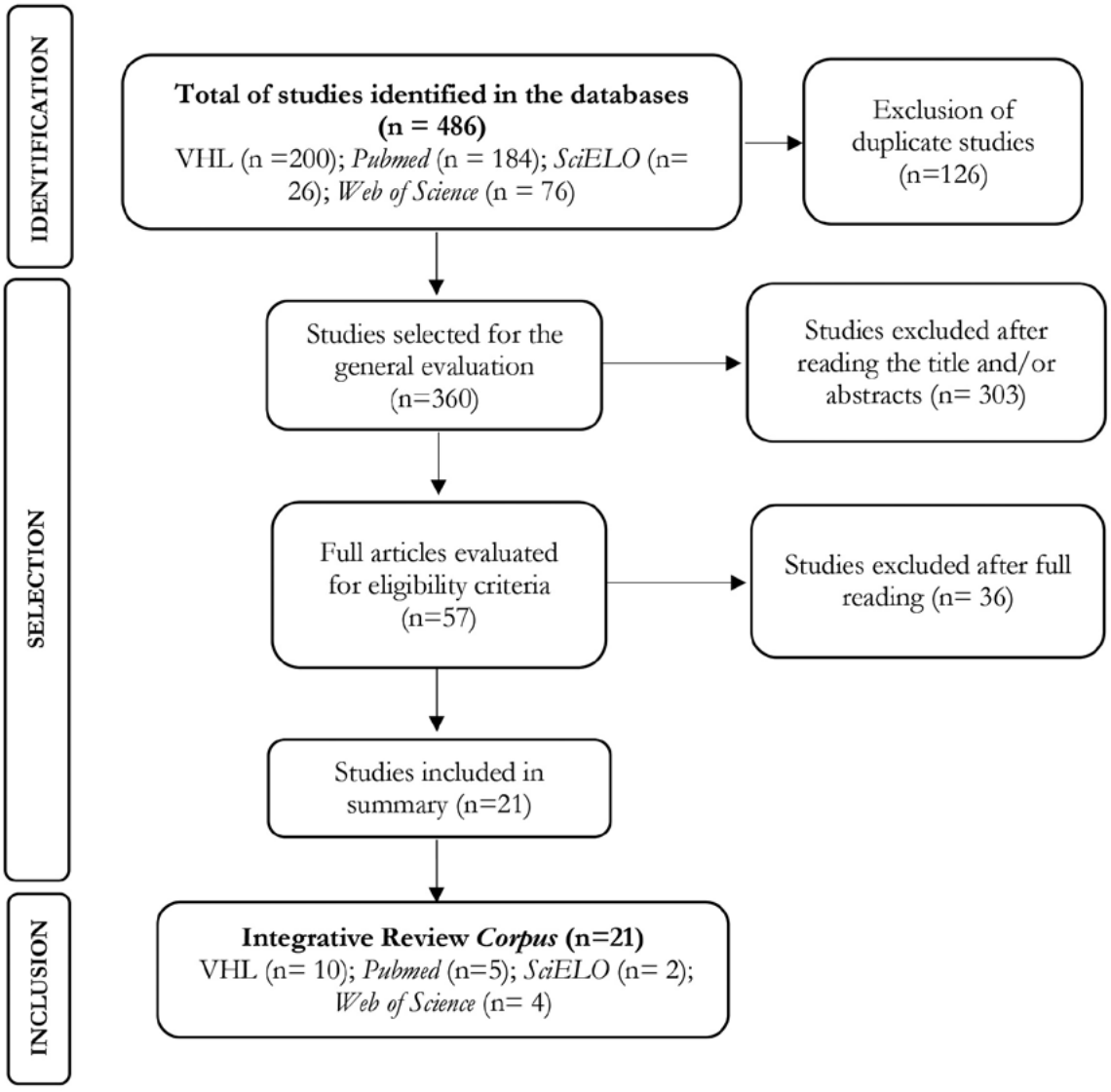

Figure 1. Flowchart of the selection of articles from the integrative review corpus. Curitiba, PR, 2020.

The majority of publications were published in 2017 (n=7; 33.3%) and 2015 (n=3; 14.3%), followed by 2019 (n=3; 14.3%), 2018 (n=2; 9.5%), 2016 (n=2; 9.5%), 2014 (n=2; 9.5%), 2020 (n=1; 4.8%) and 2012 (n=1; 4.8%).

The main language of dissemination of the studies was English (n=19; 90.5%), followed by Portuguese (n=2; 9.5%). Regarding the countries of origin of the publications, Brazil (n=4; 19.0%) and the United States (n=4; 19.0%) stood out.

Regarding the methodological design, cross-sectional (n=8; 38.1%) and longitudinal (n=8; 38.1%) studies predominated, followed by prospective cohort studies (n=4; 19.0%), and randomized controlled clinical trial (ECCR) (n=1; 4.8%). In the sample size, there was a quantitative variation from 246 older people in a controlled and randomized clinical trial to 27,652 older people in a prospective cohort study.

As for the level of evidence of the analyzed studies, level 2b (n=11; 52.4%) predominated, followed by level 2c (n=9; 42.8%) and 1a (n=1; 4.8%). For better visualization and analysis of the articles selected in the review, Table 1 was built, with categorization of the studies included in the review.

Table 1. Categorization of studies that made up the *corpus* of the integrative review. Curitiba, PR, 2020.

Author(s) /Year	Type of study/ Sample	Objective(s)	Main results/ Level of Evidence
Guedes et al., 2020[18]	Cross section/ n= 5,501	To categorize non-frail, pre-frail and frail older people in terms of fast and slow gait speed.	The presence of depressive symptoms gradually increased with the onset of frailty and there was a significant association between the conditions (p<0.01) /2c.
Silva et al., 2019[19]-	Cross section/ n= 360	To estimate the prevalence of depressive symptoms and associated factors in older patients treated at a referral center.	There was an association between depressive symptoms and physical frailty [*Odds ratio* (OR) =1.94, 95% CI 1.41-2.66] /2c.
Chang et al., 2019[20]	Longitudinal/ n= 3,352	To examine the co-occurrence of frailty and depressive symptoms at the end of life, the possibility of reversal of symptoms, their reciprocal relationship and the effects on mortality.	The coexistence of frailty and depression symptoms was associated with higher mortality (p<0.05) /2b.
Park and Lee, 2019[21]	Longitudinal/ n= 486	To analyze the factors associated with frailty among young older adults (<75 years old) and old older adults (>75 years old).	Depression was associated with worsening frailty over a three-year period (p<0.001) /2c.
Herr et al., 2018[22]	Cross section/ n= 1,253	To estimate the prevalence of frailty among centenarians included in a multinational study and investigate associated factors.	The overall prevalence of frailty (3 criteria or more) was 64.7%. Among the factors associated with frailty was the presence of depression (p<0.05) /2c.
Lee, Won and Son, 2018[23]	Cross section/ n= 289	To identify the influence of combined depression and physical frailty on cognitive impairment in heart failure.	The combined influence of depression and physical frailty increased the risk of cognitive impairment in unadjusted models (OR 4,360) and adjusted models (OR 3,545) /2c.
Albala et al., 2017[24]	Longitudinal/ n= 2,098	To study the frequency of the frailty phenotype and its association with mental health and survival in Chilean older people.	There was an association between physical frailty and depression (p<0.001) /2b.

to be continued

Continuation of Table 1

Author(s) /Year	Type of study/ Sample	Objective(s)	Main results/ Level of Evidence
Ding, Kuha and Murphy, 2017a[25]	Longitudinal/ n= 4,638	To investigate physical, psychological and social predictors of physical frailty.	Depressive symptoms predict high levels of future physical frailty (p<0.05) /2b.
Ding, Kuha and Murphy, 2017b[26]	Longitudinal/ n= 4,638	To identify moderators and mediators of the effect of physical frailty in changing activity limitation in older people.	Physical frailty produces significant indirect effects through depressive symptoms and cognitive impairment in changing activity limitation in older people (p<0.05) /2b.
Lohman, Mezuk and Dumenci, 2017[27]	Longitudinal/ n= 13,495	To estimate the independent and joint associations between frailty and depression trajectories and the probability of admission and falls in nursing homes resulting in injury.	Faster increases in frailty and depression symptoms were associated with greater chances of home hospitalization and severe falls over time (Frailty: OR Nursing home =1.33, 95% CI: 1.09-1.66; OR Fall =1.52, 95% CI: 1.12 to 2.08; Depression: OR Nursing home =3.63, 95% CI: 1.29 to 9.97; OR Fall =1.16, 95% CI: 1.01 to 1.34)/2b.
Ng et al., 2017[28]-	Randomized controlled clinical trial/ n= 246	To investigate the effects of multi-domain lifestyle interventions in reducing depressive symptoms among frail and pre-frail older adults living in the community.	Interventions in multiple lifestyle domains that reverse frailty among older people also reduce depressive symptoms (p<0.05) /1b.
Tavares et al., 2017[29]	Cross section/ n= 1,609	To investigate the association of frailty syndrome with socioeconomic and health variables in older people.	Factors associated with pre-frailty and frailty were: functional incapacity for basic and instrumental activities of daily living and indicative depression (p<0.001) /2c.
Veronese et al., 2017[30]	Longitudinal/ n= 4,077	To investigate whether frailty and pre-frailty are associated with an increased risk of depression in a prospective cohort of community older people.	Frailty and pre-frailty did not predict the onset of depression during 2 years of follow-up. However, slow gait speed was a significant independent predictor of future depression (p=0.05) / 2b.
Lohman et al., 2016[31]	Cross section/ n= 3,453	To estimate the correlation between depression and concurrent frailty models.	It was observed that the three frailty definition models presented a significant correlation with depression (p<0.01) /2c.
Nascimento, Batistoni and Neri, 2016[12]	Cross section/ n= 2,402	To identify the relationships of the presence of depression, with frailty and pre-frailty in older people in the community.	An association was found between depression and frailty profiles (p<0.001) /2c.
Almeida et al., 2015[32]	Prospective cohort/ n= 2,565	To determine the relative mortality associated with past and current depression, taking into account the frailty effect.	The crude mortality risk was 4.26 for men with depression at baseline compared to men who were never depressed, and 1.79 after adjusting for frailty /2b.
Makizako et al., 2015[33]	Prospective cohort/ n= 3,025	To determine whether frailty is an important and independent predictor of incident depressive symptoms in older adults without depressive symptoms at baseline.	Frailty (adjusted OR 1.86, 95%CI 1.05–3.28, p = 0.03) was an independent predictor of incident depressive symptoms / 2b.
Ramos et al., 2015[34]	Cross section/ n= 639	To assess the prevalence and factors associated with depressive symptoms in non-institutionalized older people.	The prevalence of depressive symptoms was 27.5% and it was associated with physical frailty (p<0.001) /2c.

to be continued

Continuation of Table 1

Author(s) /Year	Type of study/ Sample	Objective(s)	Main results/ Level of Evidence
Brown et al., 2014[35]	Longitudinal/ n= 1,027	To identify striking characteristics of frailty that increase the risk of death in depressed older people.	The confluence of specific frailty characteristics [fatigue (RR=1.94, 95% CI=1.11-3.40) and slow gait speed (RR=1.84, 95% CI=1.05-3.21)] and depressive illness (p = 0.03) is associated with an increased risk of death in older people /2b.
Feng et al., 2014[36]	Prospective cohort/ n= 1,827	To examine the cross-sectional and longitudinal relationships between physical frailty at baseline and depressive symptoms at baseline and at follow-up.	The cross-sectional analysis showed an association between physical frailty and a higher prevalence of depressive symptoms (p<0.001). The longitudinal analysis revealed that pre-frail and frail individuals were more likely to present new and persistent depressive symptoms /2b.
Lakey et al., 2012[37]	Prospective cohort/ n= 27,652	To examine associations of depressive symptoms, antidepressant use, and duration of use with incident frailty.	After 3 years, 14.9% (n=4,125) of women became frail and those with high scores of depressive symptoms had the highest risk of incident frailty (OR =2.19, 95% CI =1.86-2.59) /2b.

*LE: Level of Evidence; Note: (n=21 studies). Source: The authors (2020).

DISCUSSION

Depressive symptoms and physical frailty are clinical conditions that have a high prevalence in older people, with a significant association between them[12,18,19,21,24,25,29,31,34,38]. The association between the variables was verified mainly among oldest people, according to a study carried out with 1,253 centenarians[22].

Findings from three studies highlight that physical frailty was a predisposing factor for the onset and persistence of depressive symptoms [33,36,39], being evidenced that the presence of depressive symptoms increased gradually, according to the onset of frailty[18].

Frail individuals may be more likely to develop depressive symptoms due to impaired functional abilities, physical inactivity, functional disability, and social isolation. In addition, multisystem physiological dysregulation in frailty is an important biological factor that predisposes, precipitates and perpetuates depression in old age[28,36]. Once frailty develops, clinically significant depression is more likely[39].

Frailty as a predictor of depressive symptoms is an important finding pointed out by studies[28,33,36] with a high level of evidence 1b and 2b. Thus, the identification of the physical frailty syndrome may be relevant in screening older people at risk of mental health deterioration[39]. The presence of physical frailty markers, including slow gait speed[30], fatigue and exhaustion, weakness and low physical activity were also presented as predictors of future depression[33,36].

There is a bidirectional relationship between the study variables, and physical frailty can incite depressive symptoms, as well as research showing depressive symptoms are predictors of physical frailty[21,25,27,37,40]. Findings from the literature included in this study revealed that older people with depressive symptoms are at greater risk of developing physical frailty. The presence of depressive symptoms can cause changes in behavior and social involvement, reflecting the worsening of functional status and physical frailty[12].

It is noteworthy that the depression-frailty relationship can be influenced by the use of antidepressants. In the United States of America (USA), a prospective cohort study[37] carried out with 27,652 non-frail older women (≥65 years old) examined associations of depressive symptoms, use

of antidepressants and duration of use with incident frailty. In the study, users who had depressive symptoms were 3.63 times more likely to develop frailty than non-users and non-depressed users (95% CI =2.37-5.55). A possible effect of antidepressants in increasing the risk of falls and fractures was pointed out, which in turn are associated with the development of frailty[37].

From the studies *op.cit.* it is possible to verify that both depressive symptoms and physical frailty can be predictors of each other. Results of a systematic review and meta-analysis confirm this bidirectional relationship, which identified a reciprocal interaction between depression and frailty in older people. Each condition is associated with an increased prevalence and incidence of the other, and can be risk factors for reciprocal development[38].

On the other hand, the overlapping of symptoms makes it difficult to explain how the bidirectional relationship occurs, suggesting that psychological vulnerability, reflected by depression, can be an important component of frailty[31].

Considering the relationship between depressive symptoms and physical frailty, some studies have reported negative health outcomes in older people as a result of these conditions when they act in association. Among the outcomes, the following stand out: cognitive impairment[18,23,24], activity limitation[26], worse self-rated health[19,21], functional disability for BADL and instrumental activities of daily living (IADL)[19,29], falls and hospitalizations[18,19,27].

It is noticed that the relationship between depressive symptoms and physical frailty ranges from cognitive impairment to functional incapacity, causing limitations in the activities of older people, especially IADL. These activities require greater physical and cognitive integrity, as they are related to the subject's social participation, such as shopping and using means of transport. The loss of autonomy and limitations in daily life can generate imbalance in the emotions, well-being and social image of older people[19].

The outcomes observed in the studies described in this review showed that the relationship between depressive symptoms and physical frailty contribute to increased mortality in older people[20,32,35]. In view of these outcomes arising from the relationship between depressive symptoms and physical frailty, interventions that help to reduce these conditions are necessary to prevent morbidity and mortality.

In Singapore, a randomized controlled study conducted with a sample of 246 older people, for a period of 12 months, investigated the effects of lifestyle interventions in various domains (nutritional, physical, cognitive) among older people with physical frailty in reducing depressive symptoms. In the study, the interventions proved to be effective in reversing physical frailty and had psychological benefits in reducing depressive symptoms, noticing changes in the parameters of physical frailty significantly associated with changes in the Geriatric Depression Scale (GDS) score[28].

Interventions that help reverse frailty can mediate the observed improvement in mood functioning. When depressive symptoms and physical frailty are present together, clinical and multimodal lifestyle interventions targeting common psychosocial and biological factors can prevent the onset of symptoms and reduce the severity of syndrome symptoms and adverse health outcomes[28,36].

It was observed that the studies that discussed the theme were mostly longitudinal with 2b level of evidence, which allows establishing cause and effect relationships between the research variables. However, there is a need for further studies with strong scientific evidence.

As probable limitations of this integrative review, the lack of standardization of the instruments for evaluating the variables investigated in the studies of the corpus of analysis is highlighted, which can influence the interpretation of the results. Language restrictions in the search for publications may have limited the results. As the study's strengths, clarity and methodological rigor stand out, as well as a relevant thematic approach that contributes to the practice of evidence-based care.

CONCLUSION

The integrative review showed an association between depressive symptoms and physical frailty in

older people, and it was found that these syndromes have the ability to be predictors of each other, contributing to the reciprocal onset and increase.

The association between depressive symptoms and physical frailty was related to negative health outcomes for older people, such as: cognitive impairment, activity limitation, worse self-rated health, functional disability for BADL and IADL, falls, hospitalizations, and increase in mortality.

Knowledge of these outcomes alerts to the importance of investing in preventive interventions for these syndromes, as well as the adoption of effective approaches to their treatment. Studies have shown that interventions help to reverse physical frailty and can influence the improvement of depressive symptoms.

The results produced in this study help to clarify the relationship between depressive symptoms and physical frailty in older people, while providing knowledge for the development of interventions in the gerontological area. Further research is suggested to contribute to the enrichment and deepening of this theme.

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Bibliometric study of the scientific production of Brazilian Journal of Geriatrics and Gerontology between 2014 and 2019

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Abstract

Objective: To describe and analyze the profile of publications of the Revista Brasileira de Geriatria e Gerontologia (RBGG) from 2014 to 2019. *Method:* This is a bibliometric study of the scientific production of RBGG, during the period from January 2014 to December 2019. Data collection was performed by four independent researchers, previously trained and oriented to standardize this process. The collected data were arranged in a spreadsheet in Microsoft Excel® and analyzed using the Stata version 10.0 program. The analyzed variables were organized into four axes: Publication identification; Kind of study; Authors; and Editorial process. *Results:* A total of 504 studies were published from 2014 to 2019, of which 75% are original articles and 13.49% reviews, 95.4% of the authors were Brazilian nationals and affiliation institutions were mostly in the Southeast (41.8%) and South (28.68%). The quantitative approach (70.5%) was predominant and the themes that stood out were public health (33.1%), diseases (19.9%), and health care (19.4%). The approval time showed a reduction lasted an average of four months and the publication three months. *Conclusion:* There was an increase in the number of publications during the analyzed period, with emphasis on original articles and quantitative studies. The diversity of themes reveals the most common trend, beyond those centered on the disease, and more towards biopsychosocial and behavioral processes, as verified in studies in public health. The editorial process was rapid with a significant reduction in the time between receipt and publication, and an increase in the amount of approval of the articles received.

Keywords: Scientific and Technical Publications. Brazilian Journal of Geriatrics and Gerontology. Bibliometry. Aging.

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INTRODUCTION

Scientific publications have increasingly stood out in the academic world. In the area related to the aging process, researchers seek to respond to existing gaps in the changing profile of this population, as well as the factors that are associated with morbidity, mortality and quality of life in older people[1].

In this direction, in 1998, the Open University for Older People, of the State University of Rio de Janeiro (UnATI-UERJ), Rio de Janeiro, Brazil, began its editorial project with a series of Texts on Aging. The first issue aimed to bring relevant information to the academic community about aging and older people in Brazil[2]. That issue brought as its central theme the health and quality of life of older people, emphasizing living conditions and factors related to a more autonomous and independent aging process. It took eight years to disseminate scientific productions in the area of Geriatrics and Gerontology. In 2005, the Texts on Aging had its last volume published, which consisted of three issues that addressed different themes in the context of human aging[2].

Subsequently, in 2006, Texts on Aging was restructured under the name Revista Brasileira de Geriatria e Gerontologia (RBGG), which is currently considered the most qualified journal in the area of aging in Brazilian territory. With the RBGG, the intention was to promote a policy of free and broad access to knowledge that allows greater international dissemination of Brazilian and Latin American scientific production in the area[3].

The journal is currently indexed in the following sources: Scientific Electronic Library Online (SciELO), Cabell's Directory of Publishing Opportunities, Directory of Open Access Journals (DOAJ), Free Medical Journals, Sistema Regional de Información en Línea para Revistas Científicas de América Latina, el Caribe, España y Portugal (LATINDEX), Latin American and Caribbean Literature in Social Sciences (LILACS), Red Revistas Científicas América (Redalyc), Open Access Digital Library, Ubc Library Journals, considerably expanding the dissemination of published studies[4]. With regard to qualification, according to the Coordination for the Improvement of Higher Education Personnel (CAPES), in its 2019/2020 assessment, RBGG is classified as Qualis A4, highlighting its importance in scientific dissemination in the area of Geriatrics and Gerontology[4]. Regarding the h5 Index, a metric referring to publications in the last five years, the RBGG has an h5 of 30 and the Median of h5, which corresponds to the average of citations for the articles that make up its h5 index, of 41. Considering the aforementioned metric, RBGG occupies a prominent place because, among the main periodicals published in Portuguese, it occupies the 14th position (https://scholar.google.com/citations?view_op=top_venues&hl=pt-BR&vq=pt).

The increasing relevance of the journal highlighted the need to compile information about its publications, the most discussed topics in the context of Geriatrics and Gerontology, the Institutions with the highest number of authors who publish in this journal, considering the region and state of the country, in addition to editorial information and the main characteristics of authors who are dedicated to the study of aging. In this sense, bibliometric studies make it possible to quantify the production and written scientific communication, emphasizing the productivity of authors[5]. Through bibliometrics, it is possible to monitor the development of scientific areas and, in addition to assessing the productivity of authors, it allows carrying out studies on citations, keywords, year of publication, origin of work, among others[6].

A previous bibliometric study assessed the profile of RBGG publications from 2006 to 2013[7], and found that there was a continued increase in the number of works received and published in the journal throughout the period. There was also an increase in time for publication between 2006 and 2011, followed by stability until 2013, and the most common themes were those referring to the psychological aspects of aging, physical activity and nutrition. However, considering the substantial changes in the editorial process, indexing in new databases and the time elapsed since the analysis of the aforementioned bibliometric study, there is a need for a new study on this topic in order to systematize and update the journal's profile in relation to the description of publications, types of studies published, characteristics of authorship and

editorial process, in a more recent period, identifying changes and continuities in this regard. Thus, this study aimed to describe and analyze the profile of publications by the Revista Brasileira de Geriatria e Gerontologia (RBGG) from 2014 to 2019.

METHOD

This is a bibliometric study of the scientific production of RBGG, from January 2014 to December 2019. Considering the atypical character of the year 2020 due to the pandemic caused by Sars-Cov-2, where publication of scientific production volumes was delayed, there was not enough time to include researches published in 2020. The articles listed were all published in the journal and made available on its website[4] and on the Scielo website[8].

Inclusion criteria were: original articles, thematic articles, review articles, and case reports, published in the RBGG, in the period of time in question. Publications that, in some way, referred the expression of opinions, reflections and interpretations, such as letters to the editor, editorial, update articles and interviews, were excluded; or dealing with ongoing studies, such as brief communications. The volumes were grouped following the division from 2014 to 2016 and from 2017 to 2019, as there is a similarity in the quantity of volumes published (three) by the journal between the periods in question. Between 2014 and 2016, 14 issues were published, between 2017 and 2019 there were 18, totaling 32 issues, distributed in six volumes listed in 504 publications.

This total number of publications was used to describe the type of publication variable, however, for the analysis of the other variables, the scientific productions that met the exclusion criteria were disregarded, making a total of 468 publications analyzed.

Data collection was performed by four independent researchers, previously trained and oriented, so that all collected data according to the stipulated inclusion and exclusion criteria, in order to ensure the standardization of this process. Therefore, considering the period of analysis of this study (2014 to 2019), a draw was carried out to define the years and volumes that each researcher would systematize in advance and the collected data were entered into a Microsoft Excel® spreadsheet, prepared by the team in question. After this first structuring of the database, each researcher analyzed the data referring to the periods that they had not systematized. In case of doubts or disagreements, the researcher coordinating the work was contacted to resolve them.

The analyzed variables were organized into four axes: publication identification; kind of study; authors; and editorial process. The first axis had its analysis allowed through the reading of the abstracts, in which the variables number, year, volume and type of publication were identified.

The second axis was identified by reading the abstracts and articles in their entirety, in which information was extracted regarding the variables: methodological approach (quantitative, qualitative or mixed) and study design (cross-sectional; longitudinal; review; other designs); quantitative of the sample; research theme (classification of articles in seven themes corresponding to the terms of major categories of the Health Sciences Descriptors9, as this terminology is a way to search for articles recognizedly used for health research); study funding; total number of bibliographic references and those prior to the five years of publication of the article.

The "authors" axis had the variables: number of authors, nationality, education, number of institutions to which the authors are affiliated and their corresponding geographic region. In addition, data on the main author were collected: education, gender, nationality, institution and its corresponding geographic region and state of the federation. Information regarding the background and nationality of the authors were taken from the Lattes Platform (http://lattes.cnpq.br/) and from the *Open Researcher and Contributor ID* (ORCID; https://orcid.org/), so that those whose information was not found were classified as unidentified.

The editorial process included the following variables: quantity of articles received, approved and rejected; approval time and publication time. After the research team contacted one of those responsible for the journal's editorial process, data regarding the first three variables listed were made available. The others were extracted by reading the articles published from January 2014 to December 2019.

In order to subsidize information on the scientific dissemination of publications, through Google Scholar (https://scholar.google.com.br/?hl=pt), the number of citations of each article up to the period of analysis was identified (September 2020), from which a list of the most cited studies was drawn up.

After filling out the Microsoft Excel® spreadsheets, in the pre-established model, they were all consolidated in a single database, analyzed in the Stata program, version 10.0, and, subsequently, there was the systematization of the prevalences of the variables, presented as tables and figures.

RESULTS AND DISCUSSION

RBGG published 504 studies, of which 250 were from 2014 to 2016 and 254 from 2017 to 2019, with a predominance of publications in the form of original articles (75%); 13.49% are review articles; 6.35% are editorials; 2.78% thematic articles; 0.79% case reports; 0.6% of update articles; 0.6% are brief communications and with a percentage equal to 0.2%, interviews and letters to the editor.

After applying the exclusion criteria, there were 468 publications, corresponding to 92.86% of all RBGG publications, being 232 from 2014 to 2016 and 236 from 2017 to 2019. These publications are distributed among six issues of the journal, in a total of 32 volumes. It was found that 81.22% (380) are original articles, 14.96% (70) review articles, 2.99% (14) thematic articles, 0.86% (four) case reports. Thus, there is an increase in the number of articles published in the RBGG, compared to a bibliometric review of this same journal that analyzed the period from 2006 to 2013, and included a total of 366 articles[7].

The field of research involving older people was included in other recent bibliometric reviews, both in health and in other areas of knowledge[10-16], which demonstrates the current interest of the academic community in knowing the profile of publications in this segment. The undeniable importance of the ascendancy of publications lies in the possibility of transferring knowledge to the improvement of professional practice, allowing the expansion of care for the older population and combating health conditions that compromise the health of this population group[17,18].

Among the authors of publications, in the period from 2014 to 2016, it was found that there were 896 different authors, who are predominantly Brazilian (95.4%). The institutions that were affiliated are from the Southeast (41.18%) and South (28.68%), and most had training in Physiotherapy (25.11%), Medicine (14.51%) and Nursing (11.61%).

In the period 2017 to 2019, there were 867 different authors and the predominant characteristics were similar to those verified in the previous period, with 96.77% Brazilians. Regarding the location of the authors' affiliation institutions, there was a reduction in those located in the Southeast to 39.68% and those in the South to 24.45%, and even so, these two Regions continued to be the highlights with greater participation in the volume of productions, as observed in other studies[7,16]. Nursing education was the most prevalent (29.87%), followed by Physiotherapy (15.46%) and Medicine (13.03%).

Similar characteristics were observed in the previous bibliometric review, published in the RBGG, regarding the nationality of the authors and the respective regions of the country with greater prominence[7]. In the same study, there is an increase in publications with nursing authors, also identified in this analysis. This fact may be related to the strengthening of research groups in Geriatrics and Gerontology in academia, particularly in Nursing[19,20], and their alignment with the Ministry of Health's Agenda of Research Priorities, which has health of older people as one of its priority axes[21].

The results referring to the number of authors and number of institutions, and those related to the main author (gender, education and nationality; region of affiliation institutions) are presented in Table 1. Among these variables, two were presented considering the quantity of their frequency, from 2014 to 2019: the "education" which includes those with a frequency greater than 12 and the "affiliation institution" which has eight or more publications. While nationality was categorized in order to dichotomize authorship between Brazilian and foreign (Argentine, Chilean, Colombian, Peruvian and Portuguese).

According to Table 1, it can be seen that the predominance of the number of authors per article has remained between four and six, with a considerable reduction in the percentage, referring to seven authors or more, from 10.8% to 0.4%. In both periods analyzed, there is a predominance of female authors, corresponding to 78.9% from 2014 to 2016 and 70% from 2017 to 2019. There was maintenance of a substantial prevalence of Brazilian main authors, with an increase in the period from 2017 to 2019 in relation to the previous period of approximately 4%; while graduations in Nursing and Physiotherapy represent the predominant training among the main authors, making up a representative percentage of 39.7% in the first period in question and 50.3% between 2017 and 2019.

Malta et al.,[22] in a bibliometric study on Chronic Non-Communicable Diseases, they identified a similar profile of authors and their institutions. The predominance of women among the main authors shows advances in gender inclusion, however, there are still substantial setbacks in this inclusive process, since, despite this increasing role of the female in scientific production, women are still the ones with the least incentives, such as productivity grants of the National Council for Scientific and Technological Development (CNPq)[23].

The predominance of a greater number of authors, corroborated in other bibliometric studies with older people and related themes[22,24], shows the significant character that co-authorship has in scientific production, as it allows the integration of different knowledge and skills that support an intense scientific collaboration, which is of intense relevance due to the complexity of the themes analyzed.

Table 1. Descriptive analysis of variables referring to the main author of articles published in RBGG between 2014 and 2019. Natal, RN, 2021.

	Period		
	2014 to 2016	2017 to 2019	TOTAL
Author profile	n (%)	n (%)	N (%)
Number of authors			
0 to 3	91 (39.2)	72 (30.5)	163 (34.8)
4 to 6	116(50)	163 (69.1)	279 (59.6)
7 or more	25 (10.8)	1 (0.4)	26 (5.6)
Total	232 (100)	236 (100)	468 (100)
Sex			
Male	49 (21.1)	72 (30.5)	121 (25.9)
Female	183 (78.9)	164 (69.5)	347 (74.1)
Education			
Nursing	32 (13.8)	82 (34.8)	114 (24.3)
Physiotherapy	60 (25.9)	36 (15.2)	96 (20.6)
Medicine	19 (8.2)	33 (13.9)	52 (11.1)
Nutrition	25 (10.8)	16 (6.8)	41 (8.8)
Physical education	20 (8.6)	14 (5.9)	34 (7.2)
Psychology	14 (6.0)	9 (3.8)	23 (4.9)
Dentistry	10 (4.3)	11 (4.7)	21 (4.5)
Occupational therapy	8 (3.4)	6 (2.5)	14 (3.0)
Pharmacy	6 (2.6)	6 (2.5)	12 (2.5)
Gerontology	4 (1.7)	9 (3.8)	13 (2.8)
Not identified	12 (5.2)	0 (0.0)	12 (2.5)
Others	22 (9.5)*	14(5.9)**	36 (7.70)

to be continued

Continuation of Table 1

	Period		
	2014 to 2016	2017 to 2019	TOTAL
Author profile	n (%)	n (%)	N (%)
Nationality			
Brazilian	219 (94.4)	232 (98.3)	451 (96.3)
Foreign***	13 (5.6)	4 (1.7)	17 (3.7)
Number of institutions			
1	112 (48.3)	117 (49.6)	229 (48.9)
2	69 (29.7)	69 (29.2)	138 (29.5)
3	30 (12.9)	27 (11.4)	57 (12.2)
4 or more	21 (9.1)	23 (9.7)	44 (9.4)
Region			
Midwest	6 (2.59)	24 (10.3)	30 (6.4)
North East	44 (19.0)	49 (21.0)	93 (19.8)
North	10 (4.3)	4 (1.7)	14 (2.99)
Southeast	100 (43.1)	102 (42.5)	202 (43.2)
South	59 (25.4)	53 (22.7)	112 (23.9)
NA	13 (5.6)	4 (1.72)	17 (3.6)

* Social Communication, Law, Economics, Home Economics, Environmental Engineering, Speech Therapy and Social Work; ** Biological Sciences, Economics, Statistics, Aesthetics and Cosmetics, Philosophy, Speech Therapy, History, Arts, Social Work, Information System and Data Processing Technology;*** Argentine, Chilean, Colombian, Peruvian and Portuguese.

At the institutional level, it was found that the publications have authors from one or two different institutions, among which USP (5.6%), UFRN (3.9%) and UFMG (3%) stand out in the first period and in the second, the first two remain with relevant percentage growth in the University of Campinas of 3.4%, and in the University of Passo Fundo, whose percentage has doubled (2.6% to 5.2%). Thus, it is possible to infer that there is a higher prevalence of publications by the Southeast, South and Northeast regions, in this order of prevalence, due to a greater production by authors linked to institutions in São Paulo, Minas Gerais, Rio Grande do Sul, and Rio Grande do Norte, with emphasis on the growth in the production of those located in the Federal District, from 1.7% to 6.4%.

The linkage of authors to public higher education institutions, for the most part, has been observed in other bibliometric studies,[16,22] and it highlights the social importance of this segment in the scientific production and current reality, as the advancement of science and technology, especially in health, has the potential to promote changes in people's lives and health. Thus, it appears that it is essential that there is encouragement and investment in public education, in disagreement with the funding restrictions that have been observed in Education, science and technology, expanding research groups and increasingly strengthening scientific production on older people health[22].

In Table 2, it can be seen that the articles in question present a higher prevalence of themes related to Public Health, diseases and health care, with a predominant quantitative approach. However, the increase of almost 7% of qualitative studies between the analyzed periods stands out; a predominance of research published simultaneously in Portuguese and English (99.6%) between 2017 and 2019; and those who did not have financing (77.6%). Among the periods in question, there is an inversion in the predominance of publications, initially studies whose references were not updated predominate, and between 2017 and 2019 the articles present a percentage of 66.5% of the used references published in the last 5 years.

The growth of scientific production related to public health and diseases in the older population

is strongly related to the prioritization, in the global and national agenda, from the first decade of 2000, on actions to promote, prevent and monitor non-communicable chronic diseases. These have fostered the development of actions and studies that support paradigm shifts and boost a better quality of life for Brazilians[22].

Regarding the themes in Geriatrics and Gerontology at RBGG, the diversity of themes and disciplinary areas in the present study reveals the broader trend of contemporary research, beyond those centered on the disease, and more towards biopsychosocial and behavioral processes, reflecting the same direction of studies in public health[16].

Table 2. Descriptive analysis of variables related to articles published in the RBGG between 2014 and 2019. Natal, RN, 2021.

	Period		
	2014 to 2016	2017 to 2019	TOTAL
Publication profile	n (%)	n (%)	N (%)
Theme			
Public health	72 (31.0)	84 (35.6)	155 (33.1)
Health care	46 (19.8)	45 (19.3)	91 (19.4)
Diseases	44 (19.0)	50 (21.2)	93 (19.9)
Analytical, diagnostic and therapeutic techniques and equipment	36 (15.5)	20 (8.5)	55 (11.7)
Psychiatry and Psychology	3 (12.9)	29 (12.3)	59 (12.6)
Phenomena and processes	4 (1.7)	3 (1.3)	7 (1.5)
Anthropology, education, sociology and social phenomena	0 (0)	5 (2.1)	5 (1.1)
Methodological approach			
Quantitative	172 (74.1)	158 (66.9)	330 (70.5)
Qualitative	59 (25.4)	77 (32.6)	136 (29.1)
Mixed	1 (0.4)	1 (0.4)	2 (0.4)
Study design			
Cross-sectional			
Descriptive	28 (12.1)	28 (11.8)	56 (11.9)
Analytics: Sectional	11 (4.7)	25 (10.6)	36 (7.7)
Analytics: Ecological	1 (0.4)	5 (2.1)	6 (1.3)
Other cross-sectional studies	123 (53.0)	103 (43.6)	200 (48.3)
Longitudinal			
Cohort	3 (1.2)	5 (2.1)	8 (1.7)
Experimental/Almost experimental	11 (4.7)	6 (2.5)	17 (3.6)
Clinical trial	7 (3.0)	1 (0.4)	8 (1.7)
Other longitudinal studies	7 (3.0)	8 (3.4)	15 (3.2)
Review			
Integrative review	11 (4.7)	25 (10.6)	36 (7.7)
Systematic review	7 (3.0)	12 (5.1)	19 (4.1)
Other reviews	15 (6.4)	6 (2.5)	21 (4.5)
Other designs *	8 (3.4)	12(5.1)	20 (4.3)

to be continued

Continuation of Table 2

	Period		
	2014 to 2016	2017 to 2019	TOTAL
Publication profile	n (%)	n (%)	N (%)
Sample (N)			
0-33	55 (23.7)	47 (19.9)	102 (21.8)
34-112	64 (27.6)	35 (14.8)	99 (21.1)
113-304	44 (19.0)	55 (23.3)	99 (21.1)
305 and more	69 (29.7)	99 (42.0)	168 (35.9)
Language of the article			
Portuguese only	102 (43.9)	0 (0.0)	102 (21.8)
English only	6 (2.6)	0 (0.0)	6 (1.3)
Portuguese and English	118 (50.9)	235 (99.6)	353 (75.4)
Spanish and English	6 (20.6)	1 (0.4)	7 (1.5)
Research funding			
No	184 (79.3)	179 (75.9)	363 (77.6)
Yes	48 (20.7)	57 (24.1)	105 (22.4)
References			
Not updated	153 (65.9)	79 (33.5)	232 (49.6)
Updated	79 (34.1)	157 (66.5)	236 (50.4)

* Ethnographic; Exploratory; Exploratory-descriptive; Methodological; Case study; and Case series

The predominance of quantitative studies in the field of aging has been observed in other publications[25,26], which highlights the commitment of epidemiological studies to health promotion and the analysis of its determinants in human communities[27]. Although the present research demonstrates a slight increase in the publication of qualitative research, there is still a considerable discrepancy between publications of qualitative and quantitative studies, as observed in other studies[28], which demonstrates the importance of reflecting on the difficulty reported by researchers in publishing studies with this design in some journals.

The considerable increase in publications, simultaneously, in Portuguese and English (48.7%) increases the visibility of this journal, in the international scope, since English is considered the universal language in the scientific community and demonstrates the precursor character of the RBGG in the internationalization of knowledge produced in Brazil[27].

Regarding the themes of the most cited articles, three of them deal with aspects of falls in older people, two of which are literature reviews, totaling 175 citations on this topic, which has been widely published in recent years[29-31]. Furthermore, publication time may have been an important factor for the most cited articles, as they date from 2014 to 2016.

The publication with more citations is a case study with primary and secondary data sources, developed by researchers at the Aggeu Magalhães Research Center, of the Oswaldo Cruz Foundation, in Pernambuco, which brings reflections on the challenges of planning public policies for the population aging. The wide range of citations is due to the topicality of the questions presented in the study, related to the aging of society that needs social policies that guarantee better health care.

The scope of the theme around public policies and socioeconomic factors associated with population aging are in evidence in the scientific community as they are emerging themes that need to be debated in all areas of health[29-32].

Table 3. *Ranking* of articles with the highest number of citations in the RBGG from 2014 to 2019. Natal, RN, 2021.

Citations	Authors	Year	Title
221	Miranda, GMD; Mendes, ACGM; Silva, ALA	2016	The Brazilian population aging: current and future social challenges and consequences
64	Soares, WJS; Moraes, SA; Ferriolli, E; Perracini, MR	2014	Factors associated with falls and recurrent falls in older people: a population-based study
64	Cordeiro, J; Del Castilho, BL; Freitas, CS; Gonçalves, MP	2014	Effects of physical activity on declarative memory, functional capacity and quality of life in older people
59	Oliveira, AS; Trevizan, PF; Bestetti, MLT; Melo, RC	2014	Environmental factors and risk of falls in older people: systematic review
54	Andrade, AN; Nascimento, MMP; Oliveira, MMD; Queiroga, RM; Fonseca, FLA; Lacerda, SNB; Adami, F	2014	Older people perception of the coexistence group: a study in the city of Cajazeiras-PB
52	Falsarella, GR; Gasparotto, LPR; Coimbra, AMV	2014	Falls: concepts, frequencies and applications to older people care. Literature revision
50	Borges, AM; Santos, G; Kummer, JA; Fior, L; Molin, VD; Wibelinger, LM	2014	Self-perception of health in older people living in a city in the interior of Rio Grande do Sul
50	Manso, MEG; Biffi, ECA; Gerardi, TJ	2015	Inadequate prescription of medications for older people with chronic diseases in a health plan in the city of São Paulo, SP
50	Silveira, MH; Ciampone, MHT	2014	Perception of the multidisciplinary team on palliative care
49	Ferreira, FPC; Bansi, LO; Paschoal, SMP	2014	Older people care services and home and institutional care strategies

In the editorial field, there were substantial advances, both in the time for approval from 2014 (10.52 ± 2.73 months) to 2019 (6.52 ± 2.03 months), and in the time of publication in the same period, corresponding to, respectively, at 5.29 (±1.71) months and 2.52 (±1.64) months, which shows an average reduction in the time for approval of four months and publication of approximately three months, as shown in Figure 1.

When comparing these results with the study carried out in 2014, the reduction in time is even more evident[7]. Between 2006 and 2013, the average time between approval and publication was 16 months and now it corresponds to seven months, with a reduction of 56.25% in relation to the previous[7]. The speed in the editorial response brings benefits both for the journal, which achieves greater versatility and favors an improvement in its bibliometric indexes related to impact factors, and for the academic community that obtains quick returns for the dissemination of scientific production and dissemination of knowledge[7,33].

Figure 2, in turn, shows that from the initial period of analysis (2014) to the end (2019) there was an increase in the number of studies received (73.3%), approved (112.1%) and rejected (75.6%), despite the stabilization in the number of received from 2018 to 2019 and a reduction in rejected from 2017 to 2018.

The data indicate that the approval rate is higher than that of rejected, which indicates that, although the journal establishes strict criteria regarding the evaluative standard during the editorial process, the rate of approval over rejection growth, in the period from 2014 to 2019, is 1.48. The stability regarding the number of articles received, observed between 2018 and 2019, can be considered within the normal range, as it remains at a higher level when compared to previous years[7].

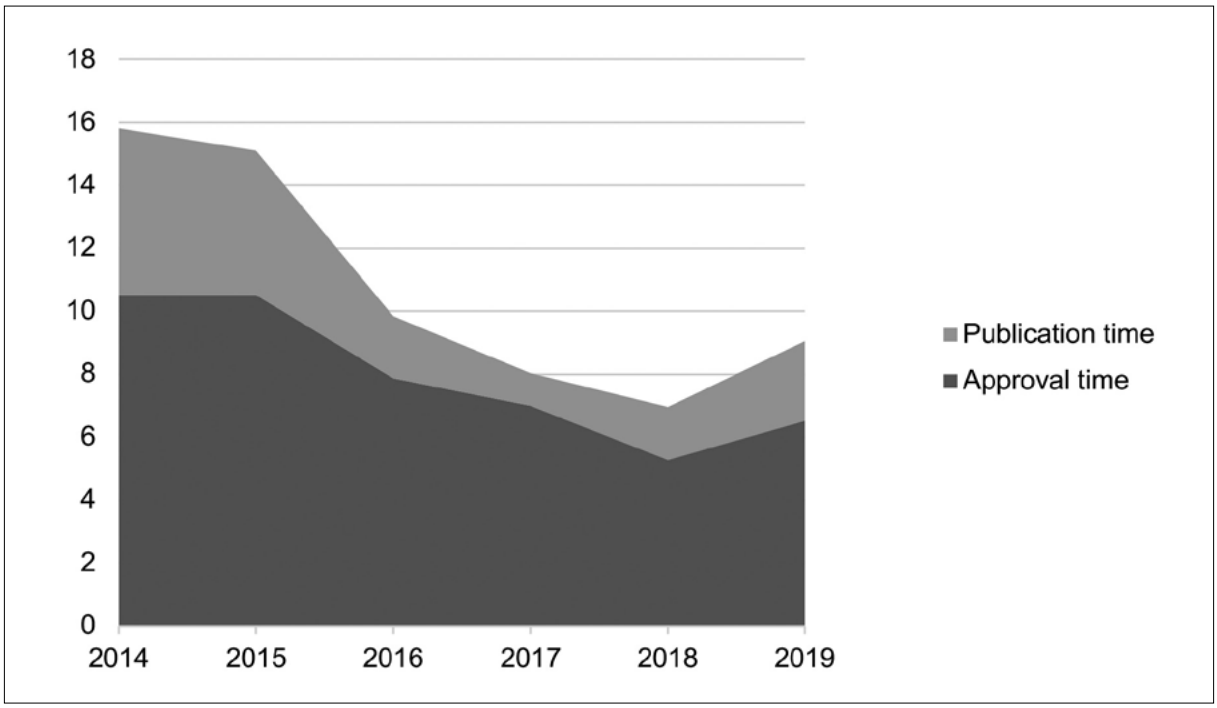

Figure 1. Trend in time of approval, publication and total[1] (in months) of manuscripts in RBGG, during the period 2014-2019. Natal, RN, 2021.

[1] Total time is the sum of the publication time and the approval time.

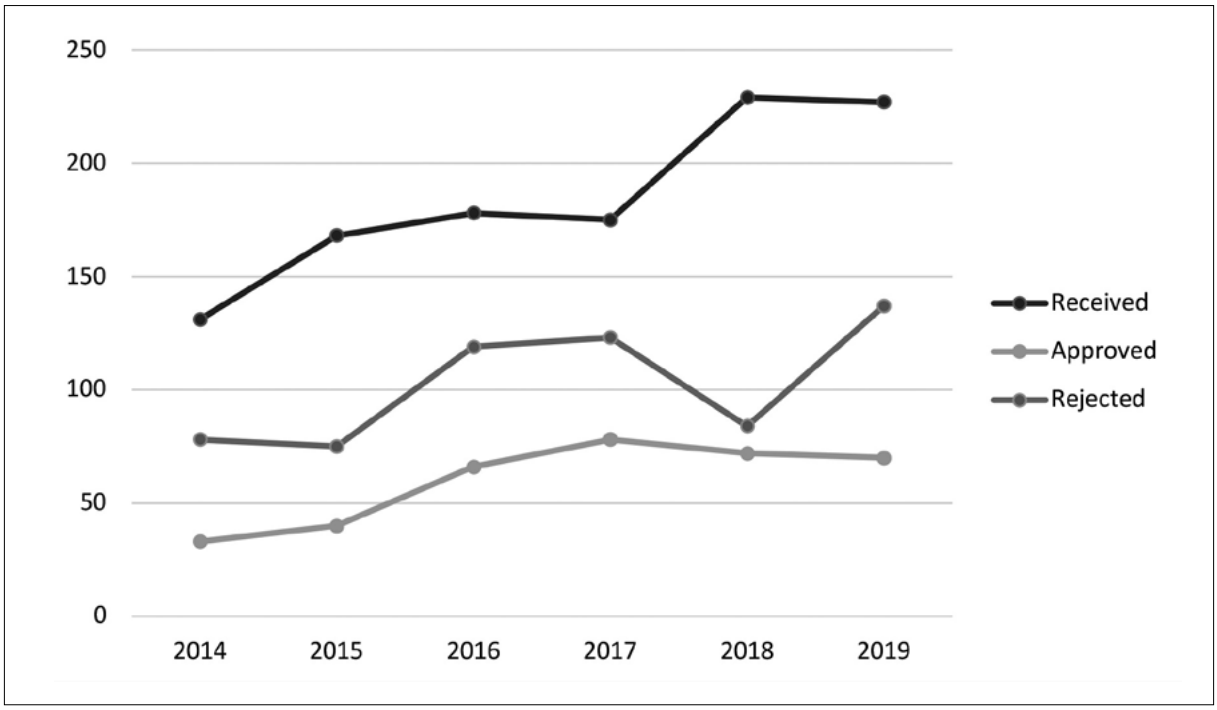

Figure 2. Trends in the number of articles received, approved and rejected between the years 2014-2019. Natal, RN, 2021.

Firmo et al.[16] evidenced an ascending profile in the quantity of publications related to the health of older people in the Revista Ciência e Saúde Coletiva, as verified in the RBGG, demonstrating the expansion of the relevance of this theme in the Brazilian scientific community. It is noteworthy that the RBGG, as a journal specialized in geriatrics and gerontology, has assumed relevant significance in the process of disseminating scientific knowledge and substantially contributed to the deepening of issues concerning human aging.

The indicators observed in this study, which favored the expansion of the RBGG, are related to the reduction in the initial response time, approval time, publication time and the increase in the number of approved articles. The low rate of qualitative studies, despite the increase identified by this study, may indicate limitations in the range of methods, when compared to other studies. Periodic events associated with the RBGG are suggested, such as the I Congress of the Brazilian Journal of Geriatrics and Gerontology held in 2018, as it brings visibility to the scope of the journal to the scientific community; and greater regularity in the public call for special issues involving the scientific community, in order to favor greater production on the topic of geriatrics and gerontology. The internationalization of the RBGG can be developed through international partnerships with researchers, associations and educational institutions added to cooperation and sharing of science in the area of aging.

CONCLUSIONS

It appears that there was an increase in the number of publications during the period analyzed, with emphasis on original articles, quantitative studies. These studies are attributed to public health themes, covering health promotion and analysis of social determinants in human communities. Scientific production is developed nationwide, predominantly, by female professionals from Nursing, Physiotherapy and Medicine courses linked to public universities in the Southeast and South regions.

The editorial process has been fast, with a significant reduction in the time between receipt and publication, and an increase in the amount of approval of articles received. RBGG remains in the ascendancy in the dissemination of scientific knowledge, which has substantially contributed to the deepening of issues concerning human aging.

It should be noted that there must be an incentive for the publication of studies carried out in the North and Northeast regions, as well as for qualitative studies. Financial investment is needed to subsidize the development of public education, which has significantly contributed to scientific advances in the area of Geriatrics and Gerontology in the country, in line with the National Health Policy for the Older Person and the demographic representation of this population group.

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Determining factors in adherence to influenza vaccination in older adults living in a city of the state of Mato Grosso do Sul

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Abstract

Objective: To identify the sociodemographic, health and knowledge factors related to the adherence to influenza vaccination in older adults in 2019, in a municipality of the state of Mato Grosso do Sul, Brazil. *Methods*: This is a quantitative and cross-sectional study, carried out with 172 older adults users of health and coexistence services. A questionnaire was applied that covered sociodemographic, health and knowledge about vaccination issues, in addition to vaccination adherence in the 2019 campaign. Log-linear regression and Bayesian networks were used to analyze the data. *Results*: There was a predominance of women, with a partner, between 60-69 years of age and elementary school. The adherence rate was 91.28% in 2019. Older adults with neuropsychiatric diseases, who used to get the vaccine annually and who had gotten it in the years of 2018, 2016 and 2015 had a higher prevalence of adherence to influenza vaccination in 2019. Bayesian networks to the adherence to influenza vaccination in 2019 showed that knowing that the National Immunization Program exists leads to trust in it, which leads the older adults to get the vaccine annually. *Conclusion*: Health professionals and the media must provide valid information so that people know and trust the National Immunization Program. The work of guiding older people about vaccination against influenza should be annual, as it is important that older adults are vaccinated every year to maintain vaccine adherence.

Keywords: Vaccination Coverage. Epidemiologic Factors. Aged. Influenza Vaccines.

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INTRODUCTION

Influenza is an acute respiratory infection caused by subtypes of the influenza virus responsible for seasonal epidemics worldwide affecting people of all ages. Some groups are at higher risk of being affected by the virus, and among them are the older people[1].

The symptoms of the disease comprise sudden onset fever, cough (usually dry), headache, muscle pain, runny nose, and malaise, which can resolve spontaneously within a week but can also progress to complications that are more frequent in individuals with cardiac and respiratory diseases, older people, and immunocompromised individuals[1]. Therefore, older people are more vulnerable both because of the physiological changes of age and the presence of associated comorbidities, making them more fragile and susceptible to morbidity and mortality from influenza and secondary infections[2].

The most effective way of preventing influenza in the world is vaccination[1]. In Brazil, it was introduced by the National Immunization Program (PNI) in 1999 with annual campaigns aimed to vaccinate at least 70% of the older people of 65 years of age and over. In 2000, older people aged 60 and over were included. In 2008, the target for vaccination coverage was 80%, and 90% in 2017, which is maintained until the present day[3,4].

So far, Brazil has achieved the annual vaccination target, and the vaccination coverage for influenza in older people was 97.2% in 2018. In 2019, it was 99.4%, and 120.7% in 2020[5]. However, due to vaccination coverage above 100%, the data used for the calculation may be outdated, as studies on the topic have shown that some older people do not adhere to the annual vaccination campaigns[6-12]. The decision of an older person to get vaccinated or not can be related to several personal and even cultural aspects.

Most of the studies carried out in Brazil on the topic are prior to the influenza epidemic that took place in the country in 2016. Characteristics such as chronic diseases, being physically active, having a partner, being followed by healthcare professionals, and having attended a medical appointment in the past 12 months contribute to vaccine adherence[2,6-12]. Regarding age, contradictory results are found in the literature. Most investigations point to greater adherence the older the person gets[2,6,8,9,12,13]. A study carried out with 286 older people from Fortaleza (CE) showed greater acceptance among the youngest[11], and another one carried out with 1,043 older people from São Paulo (SP) did not identify significant results according to the age[10]. A survey showed that there are no socioeconomic inequalities regarding vaccine adherence, and that the main reasons for non-adherence are lack of confidence in the vaccine and fear of adverse effects[9].

In China, being a woman, having chronic disease, participating in community activities, and receiving recommendations from healthcare providers were associated with greater vaccination, which shows the importance of disseminating knowledge about the importance of the vaccine[14]. In Saudi Arabia, older people with a higher level of education had greater adherence to the vaccine[15]. In Israel, the healthcare team influenced the increase in vaccination rates by providing reliable information[16].

A systematic review concluded that seasonal influenza vaccination is influenced by structural social determinants such as gender, age, marital status, education, among others; intermediary determinants such as place of residence, behavioral beliefs, social influences, and information sources; and those related to health, such as accessibility, knowledge about vaccination, and advice from healthcare professionals[17]. Another review evidenced that psychological (utility, risk perception, social benefit, attitude, experience, past behaviors, and knowledge), physical (alcohol consumption, smoking, physical inactivity, and medical conditions), contextual (lack of access and interaction with healthcare services, receiving recommendations from professionals), and sociodemographic (age, gender, race, marital status) barriers can lead to vaccine refusal[18].

Therefore, the literature shows that factors related to influenza vaccine adherence in older people vary. In Brazil, vaccination coverage for influenza was high after the 2016 epidemic[5], and understanding the factors related to the adherence of older people after this epidemic can contribute to further increase these rates. The present study

aimed to identify the sociodemographic, health, and knowledge variables about vaccination related to the adherence of older people to the influenza vaccine in 2019 in a municipality in the countryside of Mato Grosso do Sul, Brazil. As hypotheses, it is expected that the adherence to influenza vaccine in older people is related to the sociodemographic, health, and knowledge variables about vaccination.

METHOD

This is a descriptive, cross-sectional study with a quantitative approach carried out with a questionnaire for the older population assisted in the healthcare or social services in the city of Três Lagoas (MS), Brazil. In 2019, the municipality had an estimated population of 121,388 inhabitants, and there were 16 Basic Healthcare Units (UBS) in the city. Medium complexity care is offered by referring these people from the UBS to the Medical Specialties Center (CEM) and to the Clinics for Older People, Children, Women, and Orthopedics. In the city, there are two associations of retirees, one of education workers, and one of workers from energy companies offering social activities to their members.

The inclusion criteria were being aged 60 years and over, being treated at a healthcare service or community service, and being able to understand the interview questions (assessed by the interviewer's perception). The exclusion criterion was not living in the municipality.

The sample size was determined according to the proportion estimation formula in a finite population study. A significance level of 10% (alpha=0.10), a sampling error of 5% (e=0.05), and a proportion estimate of 80% (p=0.80) were used, considering that the vaccination coverage in older people was above this value, and a finite population size of N=10,067 corresponding to the total number of older people in the municipality, according to the 2010 census. The minimum sample was 171 participants. After collection, the power function was calculated to investigate the plausibility of the sample size and there was no mischaracterization or inconsistency.

The older people were selected from different services chosen for being places where there is a high flow of treatment of older people, like a UBS in the central region of the city, Clínica do Idoso, and CEM. The two associations of retirees, in which the public is predominantly older, were also included.

In these places, older people were approached at random by the researchers while awaiting care or participating in activities offered at the places, and they were invited to participate in the research. The interviews took place at different times, and it was estimated that approximately 50 participants would be sellected at each location. A total of 183 older people were approached, 11 of which refused to participate, which resulted in a sample of 172 participants (response rate 93.9%). The locations were a UBS (n=53), CEM (n=40), Clínica do Idoso (n=50), and the two retired associations (n=29). The associations were the last place visited and the collection ceased when the minimum sample of participants was reached.

A questionnaire was applied by two trained interviewers in a quiet place between January and March 2020. The questionnaire was developed by the researchersaccording to the vaccination manuals of the Ministry of Health, the Brazilian Society of Immunization, and data on adherence and non-adherence to the influenza vaccine in the literature[2-4,6-13,19-23]. The instrument underwent face validation, a subtype of content validation in which other people analyze the content to verify that it really delivers what the researcher wants to assess[24]. Three professionals carried out the validation , two from the gerontology area and one from the vaccination area. The instrument was adapted according to the suggestions and was applied to five older people to verify understanding and ease of application. All older people understood the questions, and the final version of the instrument presented the following data:

- Sociodemographic characterization: gender (male, female), age (60-69, 70-79, 80 years or more), education (non-literate, elementary school, high school, higher education, don't know/didn't answered), marital status (with a partner, without a partner), and religion (Catholic, Evangelical, Spiritist, other, none, don't know/didn't answer).

- Characterization of health and social activities: daily use of medication (yes, no); self-reported

conditions (yes, no) as cardiovascular diseases (such as systemic arterial hypertension and heart failure), respiratory diseases (such as respiratory failure, chronic obstructive pulmonary disease, and bronchitis), endocrine diseases (such as thyroid disorders and diabetes mellitus), neurological disorders (such as Alzheimer's and Parkinson's disease), osteoarticular disorders (such as osteoarthrosis and osteoarthritis), neuropsychiatric disorders (such as depression, anxiety, panic syndrome, and bipolar disorder), gastrointestinal disorders (such as gastritis and gastric ulcer), urinary disorders (such as kidney failure, and nephritis), and other diseases; practice of physical activities (yes, no); and participation in social activities ("do you participate in social activities (community center, church or groups)?" – yes, no). If the participant mentioned having another disease that was not included in the list of examples but which fits into the above categories, the researcher marked it as "yes". If the disease did not fit into the categories, it was marked as "other".

- Issues related to influenza vaccination: "Did you know that Brazil has a National Immunization Program?" (yes, no, no answer), "If so, do you trust the PNI in Brazil?" (yes no); "To your knowledge, is influenza vaccination for people aged ≥60 years indicated in Brazil?" (yes no); "Have you ever had any adverse reaction to the influenza vaccine?" (yes, no, don't know, or didn't answer); "Do Are you annually vaccinated?" (yes, no); "Were you vaccinated in 2019? In 2018? In 2017? In 2016? Waht about in 2015?" (yes; no). These questions were asked according to the age of the older person in that year. For example, if they were not 60 years old in 2015, the question was not asked for this year.

The data were entered, validated by double entry, and stored in electronic spreadsheets. Tables with descriptive measures were created, organized, and described in terms of frequency and percentage. The prevalence ratio was calculated using a log-linear regression model[25].

Bayesian learning networks, specifically the IAMB-*Incremental Association Markov Blanket* algorithm[26] was used to study pathways and interrelationships between vaccine adherence in 2019 and knowing that the PNI exists, trusting the PNI, knowing that the vaccine is indicated for older people, having the habit of being vaccinated annually, having had a previous adverse event, and having taken the vaccine in the years 2015 to 2018. They are based on techniques for learning and detecting the data structure, generating and analyzing the probabilistic relationship implied by the property of probability and conditional independence. After the relations are structured, it is possible to build a Directed Acyclic Graph *(DAG)* showing the possible paths and associations between the variables studied[27].

A 5% significance level was adopted in all analysis. The explanatory power of the sample collected *a posteriori*was analyzed after the data collection considering the alpha used in the main analyzes (0.05), and it was 83%.

The research complies with Resolution No. 466/2012 and Resolution No. 510/2016, and was approved by the Human Research Ethics Committees of Universidade Federal de Mato Grosso do Sul (opinion No. 4.216.102). Data were collected after the participants read and signed the Informed Consent Form in two copies.

RESULTS

Table 1 shows the sociodemographic, health, and social characterization data of the participants in the total sample and according to vaccination adherence against influenza in 2019. The prevalence ratio for the studied variables is also presented. The largest proportion of the sample was older women aged between 60-69 years old with elementary education, a partner, and Catholic. Most of them made daily use of medication, did not practice physical activities, did not participate in social activities, and the most prevalent diseases were the cardiovascular, endocrine, and musculoskeletal ones.

Table 2 shows the data on variables related to vaccination according to vaccine adherence for influenza and the prevalence ratio. The vaccine adherence rate in the 2019 campaign was 91.28%. Most people know and trust the PNI, know that the vaccine is indicated for older people, and are vaccinated annually.

Table 1. Sociodemographic, health, and social characterization of older participants (N=172) according to the influenza vaccine adherence in 2019 and prevalence ratio for the studied variables. Três Lagoas, MS, 2020.

Variables	Total (N = 172)	Vaccination adherence (n=157)	Vaccination non-adherence (n=15)	PR (95% CI)	*p*
	n (%)	n (%)	n (%)		
Sociodemographic					
Male	61 (35.47)	56 (35.67)	5 (33.33)	1.0	
Female	111 (64.53)	101 (64.33)	10 (66.67)	1.01 (0.92-1.11)	0.855
Age (years)					
60-69	95 (55.23)	87 (55.41)	8 (53.33)	1.0	
70-79	65 (37.79)	60 (38.22)	5 (33.33)	1.01 (0.92-1.11)	0.867
80 and over	12 (6.98)	10 (6.37)	2 (13.44)	0.91 (0.70-1.18)	0.477
Education					
Iliterate	45 (26.16)	40 (25.48)	5 (33.33)	1.0	
Elementary School	75 (43.61)	69 (43.95)	6 (40.00)	1.03 (0.91-1.17)	0.598
High School	25 (14.53)	22 (14.01)	3 (20.00)	0.99 (0.84-1.18)	0.956
Higher Education/Postgraduation	26 (15.12)	25 (15.92)	1 (6.67)	1.08 (0.95-1.23)	0.232
Didn't know / Didn't answer	1 (0.58)	1 (0.64)	0 (0.00)	-	-
Marital status					
With spouse	91 (52.91)	72 (45.86)	9 (60.00)	1.0	
Without spouse	81 (47.09)	85 (54.14)	6 (40.00)	0.95 (0.87-1.05)	0.303
Religion					
Catholicism	97 (56.40)	89 (56.67)	8 (53.33)	Not estimated	
Evangelical	59 (34.30)	52 (33.12)	7 (46.67)		
Spiritism	10 (5.82)	10 (6.37)	0 (0.00)		
Other	3 (1.74)	3 (1.92)	0 (0.00)		
None/Didn't answer	3 (1.74)	3 (1.92)	0 (0.00)		
Health and social services					
Use of medication	158 (91.86)	144 (91.72)	14 (93.33)	0.98 (0.84-1.14)	0.811
Cardiovascular diseases	121 (70.35)	108 (68.79)	13 (86.67)	1.07 (0.99-1.17)	0.082
Respiratory diseases	14 (8.14)	13 (8.28)	1 (6.67)	0.98 (0.84-1.14)	0.811
Endocrine diseases	74 (43.02)	69 (43.95)	5 (33.33)	0.96 (0.88-1.05)	0.415
Neurological diseases	8 (4.65)	8 (5.10)	0 (0.00)	Not estimated	
Osteoarticular diseases	50 (29.07)	45 (28.66)	5 (33.3)	1.02 (0.91-1.13)	0.710
Neuropsychiatric diseases	39 (22.67)	38 (24.20)	1 (6.67)	0.92 (0.85-0.99)	0.030
Gastrointestinal diseases	21 (12.21)	19 (12.10)	2 (13.33)	1.01 (0.87-1.17)	0.893
Urinary diseases	7 (4.07)	7 (4.46)	0 (0.00)	Not estimated	
Other diseases	31 (18.02)	31 (19.75)	0 (0.00)	Not estimated	
Physical activity practice	77 (44.77)	69 (43.95)	8 (53.33)	1.03 (0.94-1.14)	0.493
Participation in social activities	70 (40.70)	65 (41.40)	5 (33.33)	1.03 (0.94-1.13)	0.532

Source: table prepared by the authors themselves. PR: prevalence ratio; reference category – non-adherence; 95%CI: 95% confidence interval.

Table 2. Vaccination characterization of older participants (N=172) according to the influenza vaccine adherence in 2019 and prevalence ratio for the studied variables. Três Lagoas, MS, 2020.

Variables	Total (N = 172)	Vaccine adherence (n=157)	Vaccination non-adherence (n=15)	PR (95% CI)	*p*
Vaccination	n (%)	n (%)	n (%)		
Knows the PNI					
Yes	121 (70.35)	110 (70.06)	11 (73.34)	1.00	
No	27 (15.70)	25 (15.92)	2 (13.33)	1.02 (0.90-1.15)	0.765
Didn't answer	24 (13.95)	22 (14.02)	2 (13.33)	0.99 (0.84-1.16)	0.903
Trusts the PNI (n=121)	108 (86.26)	100 (90.91)	8 (72.73)	0.83 (0.61-1.12)	0.229
Knows that the vaccine is indicated for older people					
Yes	165 (95.93)	153 (97.45)	12 (80.00)	Not estimated	
No	1 (0.58)	1 (0.64)	0 (0.00)		
Didn't answer	6 (3.49)	3 (1.91)	3 (20.00)		
Previous adverse reaction					
Yes	25 (14.53)	22 (14.01)	3 (20.00)	1.0	
No	142 (82.56)	131 (83.44)	11(73.33)	1.05 (0.90-1.22)	0.543
Didn't answer/Didn't know	5 (2.91)	4 (2.55)	1 (6.67)	-	-
Is usually vaccinated annually	157 (91.28)	154 (98.09)	3 (20.00)	0.20 (0.07-0.56)	0.002
Was vaccinated in 2018 (n=169)	141 (83.43)	138 (89.61)	3 (20.00)	0.58 (0.42-0.80)	0.001
Was vaccinated in 2017 (n=161)	129 (80.12)	129 (87.76)	0 (0.00)	Not estimated	
Was vaccinated in 2016 (n=157)	120 (76.43)	119 (83.22)	1 (7.14)	0.65 (0.51-0.83)	<0.001
Was vaccinated in 2015 (n=154)	114 (74.03)	113 (80.71)	1 (7.14)	0.68 (0.55-0.84)	<0.001

Source: table prepared by the authors themselves. PR: prevalence ratio; reference category – non-adherence; 95%CI: 95% confidence interval; PNI: National Immunization Program.

The regression model showed that the vaccine adherence and non-adherence groups differ in terms of neuropsychiatric diseases. Individuals who reported having a neuropsychiatric disease had a higher prevalence of adherence compared to those who did not have these diseases. In addition, the analyzes showed that older people who are usually vaccinated annually and who were in 2018, 2016, and 2015 had a higher prevalence of adherence to the vaccine in 2019.

Additionally, the Bayesian Learning Networks (Figure 1) showed the pathways for adherence to the vaccine in 2019, showing that knowing that the PNI exists leads to trust in it, which leads older people to be vaccinated annually, even in 2019. Knowing that the vaccine is indicated for older people and having had a previous adverse event were not interrelated to vaccination.

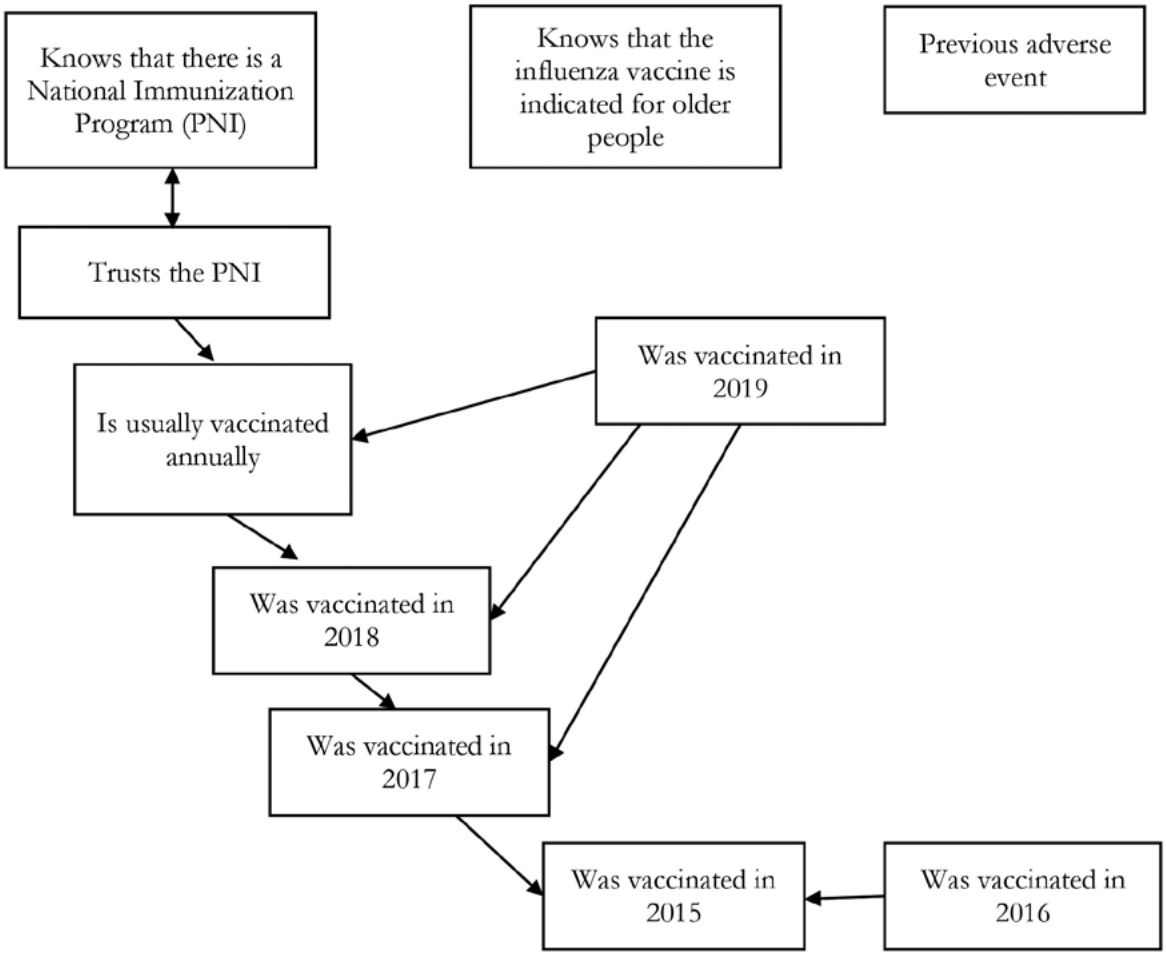

Figure 1. Directional acyclic graphs resulting from the Bayesian learning network for the variables of vaccination adherence in older people in 2019. Três Lagoas, MS, 2020.

DISCUSSION

The influenza vaccine coverage in the sample studied was 91.28% in 2019, and those with neuropsychiatric diseases who used to be vaccinated annually and who was in 2018, 2016, and 2015 had a higher prevalence of adherence to the vaccine. Knowing that the PNI exists makes the older person trust it, which results in annual vaccination, including in 2019.

Data from the PNI Information System (SI-PNI) show that the coverage in 2019 in Brazil was 99.4%, and in the municipality of Três Lagoas (MS) was 118.4%, above the target of 90% established by the Ministry of Health[5].

Studies on vaccination adherence in older people in Brazil found the prevalences of 58.7% in Timon (MA)[19], 62.6% in Campinas (SP)[7], 62.9% in Fortaleza (CE)[11], 66.9% in cities in the state of São Paulo[6], 71.0% in Pelotas (RS)[20], 71.9% in Jundiaí (SP)[21], 72.6% in one representative sample of Brazilian older people[12], 73.8% in the capital of São Paulo[8], 74.4% in Campinas (SP)[22], 74.6% in Cambé (PR)[2], 79.7 % in 1043 older people in the Health, Well-Being, and Aging Study[10], and 82.4% in Teresina (PI)[23]. Finally, a survey with 5221 older people from 70 cities in Brazil using data from the Longitudinal Study of Older People Health (ELSI-Brasil) showed coverage of 73.0%[9]. Note that all the studies mentioned were developed before the influenza epidemic in 2016. The adherence found in the current survey was the

highest compared to other investigations, which may be related to a sample selection bias, but may also be a reflection of the increase in vaccination coverage at national level, which went from 89.1% in 2015 to 99.4% in 2019[5]. It is believed that investment in national immunization campaigns, as well as the fact that the population is more used to annual campaigns for older people, can contribute to the increase in vaccination coverage.

Note that the data available in the SI-PNI are calculated using the formula "(number of doses applied in a given year/ population of older people on the site in the same year) x 100". To calculate the coverage for older people, the denominator used in 2019 corresponded to an estimate of the population published by the Brazilian Institute of Geography and Statistics in 2012, that is, the information on vaccination coverage may be overestimated. For Três Lagoas (MS), the number of older people used in the calculation was 10,406, and the number of older people vaccinated in 2019 was 12,319[5]. With population aging, the number of older people must be higher than that used for the calculation, which indicates that the official data do not match reality. Also, both the self-reported data from the present study and those from the aforementioned investigations may be subject to the memory bias of older individuals. However, for the influenza vaccination that is annual and in large-scale, the vaccination data are not entered into the information systems individually, that is, it is not possible to confirm whether an older person who reported having taken the vaccine actually took it.

Unlike previous studies showing a relation between immunization adherence and gender, age, education, marital status, and religion[2,6-9,11-13,20,22], the present study did not identify this relation. Also, no relation was identified between adherence and use of medications, physical activity, and participation in social activities, as previously reported[6,11,22].

The National Primary Care Policy of 2017 encourages the increase of PHC coverage across the country[28], which may culminate in greater involvement of multidisciplinary teams, closer relations with the population in the territory, and expansion of the offer of the vaccine. In addition, proposals such as Programa Saúde na Hora which expands the operation of the UBS to extended hours[29] and extramural vaccination posts such as shopping malls, subways, highways, increase the possibility of users having access to immunobiologicals, regardless of sociodemographic and health characteristics, which may have contributed to the vaccination coverage found in the present study. However, the data must be viewed with caution, as they refer to a sample of older people from a single Brazilian municipality.

The relation between chronic diseases and influenza vaccine coverage has been described previously[7-9,11-14,17]. In the present survey, neuropsychiatric diseases were the only ones related to vaccine adherence. Those who reported having a disease in this group had a higher prevalence of adherence. In South Korea, no relation was found between depressed mood and stress and influenza vaccine coverage in older people[30]. On the other hand, another survey showed that older people identified with chronic loneliness visited the doctor more than non-lonely older individuals[31], which may contribute to vaccine adherence. However, the relation between psychiatric disorders and vaccination needs to be further investigated in further studies, including which disorder the individual has.

The analyzes showed that older people who are usually vaccinated annually and who were in 2018, 2016, and 2015 had a higher prevalence of adherence to the vaccine in 2019. The Bayesian Learning Networks also support these data, showing that knowing that the PNI exists leads the older person to trust in it, which leads them to be vaccinated annually. Therefore, knowledge and trust about the PNI were determining factors for vaccination adherence. A systematic review described sociodemographic and physical variables, past behaviors (not having taken the vaccine before) and lack of trust in the vaccine as factors leading to refusal to be vaccinated[18]. The present study is in line with the results of the review when it shows a relation between having taken the vaccine before, trust in the immunization program, and vaccine adherence. Potential barriers to vaccination such as lack of trust need to be overcome to increase awareness and acceptance of the vaccine.

A Greek study showed that beliefs related to the influence of other people on behavior and actions such as recommendations from doctors, pharmacists, family and friends were related to vaccine adherence[32]. The authors suggest that informational support and health education are essential for increasing vaccination coverage in older people, and that healthcare professionals play a central role as they can provide clear, comprehensive, and truthful information about the vaccine[32]. In Portugal, the greater use of healthcare services, having measured blood pressure in the last 12 months in the service, and having visited the family doctor in the last four weeks were associated with vaccination adherence[33], which reinforces the importance of taking advantage of the patient's contact with the service to talk about the importance of vaccination.

Advertisements and guidelines regarding the spreading by the media of dates, places, and times of national immunization campaigns can encourage the vaccination of the population. The Pesquisa Nacional por Amostra de Domicílios Contínua surveyed the access of Brazilians to Information and Communication Technology (ICT) and identified that the ratio of older people who accessed the internet rose from 24.7% in 2016 to 31.1% in 2017, showing the largest proportional increase among age groups[34].

Having had a previous adverse event was not interrelated to vaccination in 2019, unlike a review showing that the decision to vaccinate or not contemplates the perceived severity of the disease, the probability of having it, and the risk of post-vaccination adverse events[18]. Other investigations report that fear of adverse post-vaccination effects may contribute to non-adherence[2,9,21,35]. However, these studies were developed before the epidemic in 2016. One hypothesis that this data was not evidenced in the present study is that with the epidemic more information about vaccine adverse events was disseminated, reducing fear. However, the topic needs further research to be better understood.

The present study has some limitations: as it is a cross-sectional design, it is not possible to infer causality; despite the effort to include older participants from different points of care in the city, the data cannot be generalized as it is a convenience sample comprising individuals who attended the healthcare services and coexistence in a single municipality, which are more prone to self-care; some self-reported information such as the presence of diseases, use of medications, and vaccination adherence are subject to the participants' memory bias. We must also mention the scarcity of surveys with recent data related to influenza vaccination in older people in the national literature, which restricts the discussion about the Brazilian reality. Despite this, it is understood that the study contributes to the current knowledge about factors related to vaccine adherence.

CONCLUSION

There was a higher prevalence of adherence to the influenza vaccine in older people with neuropsychiatric diseases. Most participants knew and trusted the PNI, knew that the vaccine is indicated for older people, and used to be vaccinated annually, variables related to a higher prevalence of vaccine adherence. No relation was identified between vaccination adherence and sociodemographic variables.

Health education in the community must be conducted so that older people know the PNI and trust it to avoid possible distortions that may reduce vaccination coverage. The healthcare professionals are important as opinion makers about vaccination. Also, it is important that older people are vaccinated every year to maintain vaccine adherence. Therefore, the work to guide and attract the target audience must be annual. We also reinforce that using the media to spread reliable information about national vaccination campaigns can be an effective information and knowledge tool.

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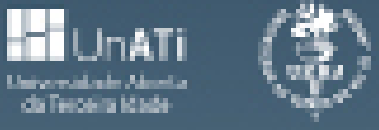
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