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ASSOCIATION BETWEEN FALLS, DEPRESSION, FEAR OF FALLING AND QUALITY OF LIFE IN INSTITUTIONALIZED ELDERLY

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Abstract: **Introduction:** Falls in the elderly can cause loss of motor function, causing significant damage to their quality of life. Both falls and the fear of falling can be common and cause potentially serious results and, together with depression, are important causes for the loss of autonomy and functional independence of these individuals. Objective: to verify the relationship between the event of a fall and the fear of falling, depression and the quality of life of institutionalized elderly people. **Method:** A cross-sectional study was carried out in four long-stay institutions. The instruments used were: Mini-Mental State Examination, Geriatric Depression Scale (GDS), Falls Efficacy Scale (assesses fear of falling), WHOQOL-OLD and WHOQOL-BREF (for quality of life). **Results**: The sample consisted of 24 institutionalized elderly, 15 women and 9 men, with an average age of 77 years. Statistically significant results showed that women tend to fall more than men (p=0.036), the group that suffered a fall had a greater fear of death and dying in relation to the other group (p=0.032) and that the higher the score of GDS, the greater the fear of falling of these institutionalized elderly. **Conclusion:** This study showed that elderly people with a history of falls in the last year are more vulnerable to developing fear of suffering a new fall and, therefore, less confidence to carry out basic activities of daily living. In addition, falls are highly related to the quality of life of these elderly people.
Keywords: Elderly; falls; Depression, Fear, Quality of life.

INTRODUCTION

The Brazilian elderly population comprises 29,374 million people, totaling 14.3% of the country's total. Life expectancy in 2017, for both sexes, increased to an average of 76 years, with 79.6 years for women and 72.5 for men. It is also estimated that in 2050 one fifth of the world's population will be 60 years old or older, and of these 19% will be 80 years old or older [1].

Aging is often accompanied by physical and mental health problems, which can be caused by chronic diseases or falls, or their association [2]. In addition, one third of elderly Brazilians suffer at least one fall each year [1].

There are many chronic diseases that can lead the elderly to dependence, and institutionalization may also occur due to its consequences. Among these diseases, Systemic Arterial Hypertension (SAH) and Diabetes mellitus (DM) stand out, being considered the main risk factors for the development of kidney problems, heart and cerebrovascular diseases, representing, therefore, high medical costs and socioeconomic factors, resulting mainly from the complications that accompany them [3]. Due to such conditions, the elderly may need numerous medications that help control the disease.

The use of different medications by the elderly is one of the factors related to the event of falls, since many elderly people do not have correct medication control and, in most cases, have several health problems, with a higher risk of high dosage and drug interactions.. These interactions can cause a decrease in the functional capacity of these elderly people, and they may experience drowsiness, fatigue and lack of energy [4].

Functional capacity can be defined as independence to carry out activities of daily living (ADLs) and beyond carrying out these activities, which is the ability to maintain the physical and mental skills necessary for an independent life, valuing autonomy and self-determination [5].

A fall is defined as an unintentional displacement of the body to a lower level than the initial position, with inability to correct it in a timely manner, determined by

multifactorial circumstances that compromise stability [6].

Falls in the elderly have a multifactorial etiology and involve an interaction between intrinsic (those related to the individual) and extrinsic (those associated with environmental characteristics) factors. Intrinsic factors include decline in functional abilities, female gender, elderly over 80 years old, previous falls, muscle weakness, decline in mobility and balance, sedentary lifestyle, nutritional deficiency, cognitive impairment, neurological conditions, reduced hearing and visual acuity, polypharmacy and alcohol abuse. Extrinsic factors include environmental conditions, slippery and uneven floors, inappropriate clothes and shoes, poor lighting, loose wires on the floor and the presence of carpets in passageways [7].

A fall can cause loss of motor function, causing significant damage to the quality of life of the elderly, with a decrease in autonomy and independence. The occurrence of falls can be considered a public health problem due to its high frequency, the associated morbidity and the high social and economic cost, especially when it takes the elderly to institutionalization [7].

In order to avoid the occurrence of falls, it is necessary to develop preventive actions, using exercise programs, environmental changes, medication review, appropriate use of clothing, educational guidance programs for the elderly, family members and professionals. Simple actions such as, for example, removing carpets and placing handrails can be of great help to avoid this event [8].

Both falls and the fear of falling can be common and cause potentially serious results in the elderly [9] and, together with depression, are important causes for the loss of autonomy and functional independence of elderly individuals [2].

The prevalence of falls in institutionalized elderly is high. Studies indicate that women have a greater number of falls and fear of falling than men [10], and that falls often occur in the bedroom. One of the most serious consequences of falls are fractures, with the ankle and hip being the anatomical sites with the highest prevalence of this condition [11].

Among the psychological factors most present in the elderly are depression, anxiety and fear of falling [12]. Fear of falling is characterized by anxiety when walking or excessive concern about falling. This fact can lead to less confidence in the ability to walk, depression, feelings of helplessness, social isolation and behavioral changes that affect functional mobility, promote physical dependence and even early institutionalization [12,13].

There is a high incidence and prevalence of psychiatric disorders in the elderly population, among which depression stands out. It is estimated that 15% of the elderly population present or have already manifested some depressive symptomatology, of which 2% manifest in a more severe form [14]. Depression has a very negative impact on the functional capacity and mobility of the elderly, predisposing them to falls and fractures and, consequently, fear of suffering a new fall [15].

The fear of falling is associated with worse health conditions, advanced age, depression, difficulties in ADLs, injuries caused by falls, reduced social interaction and a sedentary lifestyle, situations that may directly influence Quality of Life. According to Zijlstra et al. [13], the prevalence of fear of falling ranges from 20% to 85% among non-institutionalized elderly [7].

The World Health Organization (WHO), through the World Health Organization Quality Of Life Group - WHOQOL Group, in 1995 defined the concept of Quality of Life as "... the individual's perception of their position in life in the context of the culture

and system of values in which he lives and in relation to his goals, expectations, standards and concerns" [16]. Being the Quality of Life something subjective, where each person has a different particular definition.

In a study on understanding what quality of life is for the elderly, Vecchia et al. [17] found several factors that influence life towards a good quality. They are: interpersonal relationships, good physical and mental health, material goods (house, car, salary, access to health services), leisure, work, spirituality, honesty and solidarity, education (throughout life) and favorable environment (without pollution and without violence).

Although there is a growing awareness of the risks of falls in the elderly and their consequences, little is known about the emotional impacts on this population and even which psychological factors are present in elderly people who have never suffered falls and those who have already suffered, in view of the risks of everyday life.. The few studies on the event of falls and psychological factors do not compare institutionalized elderly people who have suffered and those who have not suffered falls, correlating this event with their emotions and/or psychological factors [2].

Thus, carrying out this study was justified by the fact that falls in the elderly are considered a public health problem; the grandiosity of the fall event is experienced as a negative and often disabling situation in the lives of the elderly. There are still few studies in this area considering the institutionalized elderly population in the State of São Paulo, mainly in the city of São Paulo in relation to the evaluation of the fall in the scope of the emotions of these individuals. This research aimed to verify the correlation between the fall event, the fear of falling, depression and the quality of life of institutionalized elderly.

METHOD

A cross-sectional study was carried out, using interviews and questionnaires that were applied to institutionalized elderly people who had or had not suffered a fall in the last year, regardless of the type of fall (from their own height, with or without sequelae). This study was approved by the Ethics Committee of Universidade Ibirapuera (Opinion: number 2,220,628) and four institutions participated in the research.

The study included elderly people who resided in a long-stay institution for more than three months, elderly people who understood and agreed with the signing of the Free and Informed Consent Form (TCLE), independent and semi-dependent elderly people, who had the functions preserved cognitive abilities, who scored ≥21 according to the Mini-Mental State Examination (MMSE).

Exclusion criteria were elderly people with difficulties in communicating, elderly people who refused to sign the TCLE, residents of less than three months in the institution, dependent elderly people and those who scored below the MMSE cutoff score. The research was carried out in four institutions.

Institution 1 had a team of nutritionists, nursing technicians, a nurse and a doctor. There is no physiotherapist or physical educator. The structure was adapted to the needs of the elderly, but some places needed a handrail, such as in the corridors.

At institution 2, the team consisted of a nutritionist, nursing technicians, a nurse, a doctor and an occupational therapist. The elderly performed activities such as crochet, painting and reading. It had a structure adapted to the needs of the elderly.

The team at institution 3 included a nutritionist, nursing technicians, a nurse, a doctor, an occupational therapist and a physiotherapist. Among the activities performed by the elderly were physical

exercises, singing and dancing, table games (dominoes, cards and checkers), crochet and knitting. Its structure was adapted to the needs of all seniors.

In the fourth institution, the team included a nutritionist, nursing technicians, a nurse, a physician, an occupational therapist, a physiotherapist and a psychologist. Among the available activities were physical exercises, dancing, table games (dominoes and checkers), crochet, knitting, drawing, painting and care for a vegetable garden present on site. The elderly could help in the day-to-day activities of the institution, such as preparing meals, shopping or picking vegetables from the local vegetable garden, helping in the office, among other tasks.

Individual interviews and questionnaires were applied. The instruments used were: the Mini-Mental State Examination (MMSE) (cognitive screening test), the Geriatric Depression Scale (GDS), the Falls Effectiveness Scale (FES-I) (assessment of fear of falling), Whoqol -Old and Whoqol-Bref (for quality of life).

The Mini-Mental State Examination (MMSE) is an important screening tool for cognitive impairment. It measures functions such as temporal and spatial orientation, immediate memory and arithmetic, with a total score of 30 points. A score of 27 or greater is effectively normal (intact). Below that, the score may indicate severe (≤9 points), moderate (10 to 20 points) or mild (21 to 24 points) cognitive impairment [18,19].

The Geriatric Depression Scale (GDS) is used to detect the perception of depression in the elderly, offering valid and reliable measurements to assess depressive disorders. It consists of 15 questions with two possible answers, yes and no [20]. A total score > 5 indicates suspicion of depression.

The Falls Effectiveness Scale (FES-I) is used to measure the fear of falling when performing 16 activities, including ADLs (answering the phone, cleaning the house, taking a shower), outside activities (going shopping, walking around the neighborhood) and social participation (visiting friends or relatives, going to a social activity). The response alternatives range from 1 to 4 points and the score from 16 to 64 points, with 16 points corresponding to no concern and 64 to extreme concern about falls [21]. This questionnaire has been used in research involving the institutionalized elderly population.

The Whoqol-Old consists of 24 questions and their answers follow a Likert scale (from 1 to 5) assigned to six facets, which are: "Sensory Functioning", "Autonomy", "Past, Present and Future Activities", "Social Participation", "Death and Dying" and "Intimacy". Each facet has 4 questions; responses can range from 4 to 20. Basically, high scores represent a high quality of life, low scores represent a low quality of life [22].

According to Fleck, Chamovich and Trentini [22], who validated the Whoqol-Old, it is essential that it be applied in conjunction with the Whoqol-Bref, which is made up of 26 questions (questions number 1 and 2 about general quality of life). The instrument has 24 facets which make up 4 domains which are: physical, psychological, social relations and environment. The answers follow a Likert scale (from 1 to 5), the higher the score, the better the quality of life. The final result is given by means of an average and when it is 1 to 2.9 - needs to improve; from 3 to 3.9 - fair; from4 to 4.9 - good; and 5 - very good [23].

Before starting the initial interview, with each participant included in the research, in accordance with Resolution CNS 466/12 on research with human beings, the researchers read the TCLE together with or for the participant, ensuring that the instructions were understood and invited the individual to

sign it. The illiterates used the fingerprint of one of their thumbs to sign their agreement with the research terms.

After signing the TCLE, when the participants were already selected by the institutions (excluding dependents), we applied the MMSE to track those who had preserved cognitive skills and, therefore, were able to respond to the other questionnaires.

In a second moment, with the objective of carrying out the data collection with each participant, a sociodemographic questionnaire was filled out for each elderly person and data was collected through the aforementioned instruments GDS, FES-I, Whoqol-Old and Whoqol-Bref, being a quantitative analysis was performed. At the end of the interview, the participants were instructed about the deadlines for returning the research results.

As already presented, the interviews were carried out individually, and the researchers read the questionnaires and the elderly answered orally. After that, the participants were divided into two groups, those who suffered falls in the last year and those who did not.

The data were submitted to statistical analysis and to describe the profile of the sample, according to the variables under study, frequency tables were created for categorical variables (gender, education, etc.), with values of absolute frequency (n) and percentage (%), and descriptive statistics of numerical variables (age, number of visits, etc.), with mean values, standard deviation, minimum and maximum values, median and quartiles.

To compare categorical variables between institutionalized elderly people who did not fall and who did fall, the chi-square test or Fisher's exact test were used, in the presence of expected values lower than 5.

To compare numerical variables between institutionalized elderly people who did not fall and who did fall, the Mann-Whitney test was used, due to the absence of normal distribution of the variables.

To analyze the relationship between numerical variables and the FES-I scale score, Spearman's correlation coefficient was used, due to the absence of Normal distribution of the variables. The significance level adopted for the statistical tests was 5%, that is, $p<0.05$ [24, 25].

For statistical analysis, the computer program The SAS System for Windows (Statistical Analysis System), version 9.2, was used. SAS Institute Inc, 2002-2008, Cary, NC, USA.

RESULTS

The research was carried out with 55 seniors, of whom 31 were excluded for not meeting the inclusion criteria, the main reason being that they scored below the MMSE cutoff score. Therefore, 24 institutionalized elderly were included in the study.

As for gender, 62.50% were female, 37.50% male, 37.50% were between 80-89 years old, 41.67% were single, 33.33% had no children, 75% had initiative of hospitalization by family members and 50% had studied up to primary school (TABLE 1).

Comparing gender and the fall event, 80% of the women had suffered falls in the last year and 66.67% of the men had not, with a statistically significant difference ($p=0.036$) (FIGURE 1).

According to the GDS, 17% of the elderly in the study had mild depression, 4% had severe depression and 79% had a positive score, remaining in the classification without depression (FIGURE 2).

TABLE 2 presents the results regarding the quality of life assessed by Whoqol-Old and Whoqol-Bref. A significant result was observed in the facet

Death-Dying from Whoqol-Old, in which the group that suffered a fall showed greater

fear of death and dying compared to the group that did not (p=0.032).

TABLE 3 presents the correlations between numerical variables and the FES-I scale score. As for the correlation between the score obtained in the FES-I and the number of children, a significant result was observed with r=-0.48236 and p=0.0170, and those who had fewer children or no children were more afraid of falling.

The correlation between the FES-I and the GDS score showed that the higher the GDS score, the greater the fear of falling in these institutionalized elderly, with a statistically significant result of r=0.47941 and p=0.0178.

Regarding the sensory functioning score of the Whoqol-Old questionnaire with the FES-I, it presented a significant result with r=-0.41848 and p=0.0418, the lower the score presented in relation to the sensory functioning, the greater the fear of falling.

As for the general quality of life score in relation to the FES-I, there was a statistically significant result with r=-0.41767 and p=0.0423, as the general quality of life score was lower, the fear of falling was greater.

Regarding the perception of quality of life and the FES-I, a statistically significant result was observed, r=-0.45597 and p=0.0251, and the lower the score presented in the perception of quality of life, the greater the fear of falling.

Regarding the satisfaction with health and FES-I domain, a statistically significant result was observed, r=-0.47650 and p=0.0186, the lower the score presented in this domain, the greater the fear of falling.

As for the psychological domain and the FES-I, it presented a statistically significant result, r=-0.43166 and p=0.0352, so that the lower the score in the psychological domain, the greater the fear of falling.

In the correlation between the total score obtained in the Whoqol-Bref (quality of life) and the FES-I, it presented a statistically significant result, value of r=-0.44171 and p=0.030, the lower the score presented by the elderly in this questionnaire, the greater the fear of falling.

DISCUSSION

This study aimed to evaluate the relationship between the fall event and the fear of falling, depression and quality of life of institutionalized elderly. The sample of this study was composed mostly by females, corresponding to 62.5% of the participants. In this sense, it was possible to observe statistically significant results that elderly women had a higher rate of falls when compared to elderly men (p=0.036). This result, of greater female participation, was also found in the studies by Valcarenghi et al. [2], Uchida and Borges [10], Carvalho, Luckow and Siqueira [11], which reinforces the hypothesis that the gender variable can be considered a risk factor for falls in the elderly population. One explanation for this would be the hormonal changes present in women after menopause, which can cause changes in bone tissue and muscle tissue and, consequently, a greater chance of falling.

Regarding falls, 62.5% of our study sample suffered one or more falls in the last year, that is, more than half of the sample. Another study, by Uchida and Borges [10], with the same age group and profile, showed a much lower percentage, in which 22.2% of the elderly fell in the last twelve months. This result must be further investigated in order to understand the reasons for this high percentage and to develop fall prevention strategies in this population.

In the study carried out by Sá, Bachion and Menezes [26], through a clinical trial, they verified that physical exercise can be used as a fall prevention strategy in institutionalized elderly people. In their results, from the 12-month period from the beginning of the intervention, there was a significant reduction

in the number of falls (p = 0.046). Significant differences were also observed for the scores for balance maneuvers (p = 0.001), total scores for balance and gait maneuvers (p = 0.007), handgrip muscle strength (p = 0.001) and lower limbs (p < 0.001) and flexibility of the shoulder flexion movement (p = 0.001). Therefore, it is extremely important to make the practice of physical exercises available to the elderly in these institutions, as mentioned above, this can prevent falls. In this study, it was possible to observe that two of the four institutions studied had this availability for the elderly.

Regarding the quality of life assessed by the Whoqol-Old, a significant result was observed in the Death-Dying facet, with the group that suffered a fall having a greater fear of death and/or dying compared to the group that had not suffered a fall in the last year. (p=0.032). So far, no other studies have been found in the literature that have evaluated the quality of life of the elderly by comparing them with the event of a fall using the instrument used in this research.

With regard to depression, mainly due to the medications used for its treatment, it can lead to an increased risk of falls and, as a result, fractures. One of the consequences of this medication is the psychomotor retardation of individuals, leaving them with a more unstable gait and, thus, favoring the occurrence of falls [27].

In the data obtained in this study, it was possible to observe that 73.33% of the elderly studied who fell in the last year did not present depression, and 26.67% of those who fell had a mild level. As for the correlation between the FES-I and the GDS score, it was found that the higher the GDS score, the greater the fear of falling among institutionalized elderly people. Which is in line with the result obtained by Lojudice et al. [8], in which the occurrence of falls in institutionalized elderly was associated with the presence of depression (p=0.034). On the other hand, the study carried out by Valcarenghi et al. [2] evaluated changes in functionality/cognition and depression in institutionalized elderly people who suffered falls and concluded that there was no significant influence between depression and falls in the investigated participants.

In addition to depression, lack of social interaction may be another risk factor for falls in the elderly. According to Nogueira et al. [5], elderly people with less contact with friends and family are more likely to be afraid of further falls. In the present study, elderly people who had one or more children had less fear of falling. This result illustrates what is cited by Duque et al. [28], that the fear of falling can lead to a restriction of activities, possibly due to a decrease in self-confidence about skills, leading to a reduction in social interaction and isolation, negatively affecting the quality of life of the elderly.

Considering the quality of life and the correlation with the FES-I, it was observed that the lower the quality of life score, the greater the fear of falling. This correlation was noticed in the domains of sensory functioning, general quality of life, perception of quality of life, satisfaction with health, psychological and in the total score obtained in the Whoqol-Bref. In the study carried out by Lojudice et al. [8], 42.8% of the elderly who suffered falls reported having poor health (p=0.000), with 26.2% reporting good health and 31% fair. Thus having a direct correlation between falls and quality of life.

The increased dependency of the elderly after a fall may be a possible explanation for the association between negative health perception and falls, which may trigger negative feelings, changes in memory and concentration, low self-esteem and changes in body image and appearance [12].

In an international study carried out by

Curcio et al. [29] reports factors that, when accompanied by others, precede the risk of developing fear of falling in elderly people. Among these factors are sex, age, physical conditioning, low level of education, limited mobility and the use of walking aids. The results obtained in the study highlight the importance of rehabilitation and physical training as fundamental interventions for any successful therapeutic approach or prevention of fear of falling. Older people benefit from these interventions by reducing their risk of fear of falling and possibly their risk of falling. These results further reinforce the importance of practicing physical activity within long-stay institutions, but only two of the four institutions surveyed had the possibility of performing exercises with an appropriate professional available to residents.

Fear of falling leads many elderly people to restrict their activities, leading to less confidence in their ability to walk, greater functional decline, feelings of helplessness, decreased quality of life and behavioral changes that end up affecting functional mobility, promoting physical dependence and even institutionalization early [13,30].

Cognitive alteration is a very frequent finding in institutions and is considered one of the reasons for institutionalization of the elderly, since their impairment can cause deficits in reasoning, memory, communication, spatial orientation and personality, which directly affects their social life [31]. Elderly people with a low cognitive level have a greater chance of falling, as their reaction time can be significantly lower, when compared to those with a higher level of cognition. One of the limitations of the present study was the number of elderly people included in the sample, and a larger number would allow a better comparison between groups. The inclusion in the study from the MMSE resulted in a large number of excluded. On the other hand, it was not our initial objective, but this data corroborates with other studies that show the degree of cognitive decline of institutionalized elderly [31].

Another limitation was the fact that it was a cross-sectional study, which makes it impossible to determine the order of causality between the variables and, also, the non-research of other information about individual factors (physiological changes) that may have contributed to the occurrence of falls and their consequences.

Despite the limitations, the present study represents a contribution to the scientific knowledge about the relationship between falls and the fear of falling, depression and the quality of life of institutionalized elderly people, with the FES-I being a reliable and valid instrument that allows measuring the fear of falling in the elderly population, and can be used to prevent the risk of falls.

It is hoped that the results presented may contribute to rethinking care for elderly people who have already suffered falls, so that institutions use protocols for the prevention of falls and place greater emphasis on elderly people who have already suffered falls. On the other hand, it is also necessary to strengthen fall prevention strategies in the institutionalized elderly population and in the general elderly population, seeking to avoid institutionalization due to the injuries resulting from falls.

Finally, we know that much remains to be done in favor of healthy aging and one of the problems that today appears as a public health problem is the issue of falls in the elderly. We aim, with our research, to contribute to the expansion of knowledge about falls in institutionalized elderly people, to promote discussions in favor of the health of this population and, perhaps, to enable practical actions within the scope of public policies for

the elderly.

CONCLUSION

The fall event proved to be worrying for elderly people who have already fallen, thus causing a higher rate of recurrent fear of falling, which also interferes with the quality of life of these elderly people.

Elderly people with a history of falls in the last year were more vulnerable to fear of falling again and, therefore, less confident in carrying out basic activities of daily living, which aggravates the level of dependence of these elderly people.

Regarding the event fall and depression, no significant relationship was found. On the other hand, there is a high correlation between depression and fear of falling, because, as we have seen, the level of depression can influence the fear of falling.

Falls are highly related to the quality of life of the elderly, and the greater the fear of falling, the worse the quality of life and the greater the fear of death/dying. Elderly people who fell in the last year had a lower quality of life.

As for the comparison between groups of institutionalized elderly people who suffered falls in the last year in relation to those who did not, the former had a lower quality of life and, consequently, a greater fear of falling.

Finally, as a physiotherapist interested in the area of aging, more specifically, in the context of falls in the elderly and how such an event negatively influences the psychosocial aspects of these individuals, when thinking about preventing falls, one must keep in mind that the consequences entail a high cost to the individual and society at large. Therefore, it is important to create and implement protocols to prevent falls, since, as we have seen, the practice of exercises prevents this event and allows them to have a better quality of life, promoting greater socialization and contributing to the emotional balance of the population. elderly.

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