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Level of physical activity and risk of falls in the institutionalized elderly

Nível de atividade física e risco de quedas em idosos institucionalizados

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RESUMO | INTRODUÇÃO: O envelhecimento se caracteriza pelo declínio progressivo de todos os processos fisiológicos, o que acarreta em alterações de todos os órgãos e sistemas, gerando perda de força muscular e déficit de equilíbrio. Esses processos podem ser agravados se o indivíduo for inativo fisicamente. **OBJETIVO:** avaliar o nível de atividade física e risco de quedas em idosos institucionalizados. **MÉTODOS:** Trata-se de um estudo quantitativo transversal, realizado com os 24 idosos residentes em uma ILPI, na cidade de São Paulo. Para a avaliação do equilíbrio foi utilizada a Escala de Equilíbrio de Berg e a avaliação do nível de atividade física, realizada por meio do IPAQ. **RESULTADOS:** a frequência de quedas nos últimos 3 meses foi de 16,66% e para o último ano de 20,83%. Idosos com tempo de institucionalização menor que 5 anos apresentam maior risco de quedas do que os idosos com maior tempo de institucionalização. Em relação à deambulação observamos que 41,66% dos homens deambulavam, índice este superior ao sexo feminino. Quanto ao equilíbrio, foi observado que 83,33% do total dos idosos apresentavam déficit de equilíbrio, sendo destes 50% com 80 anos ou mais. Em relação ao IPAQ, 87,5% dos idosos foram classificados como sedentários. **CONCLUSÃO:** A partir deste estudo foi possível concluir que, idosos residentes nessa ILPI apresentam alto índice de risco de quedas, sendo este risco maior em idosos do sexo feminino e idosos institucionalizados a menos de 5 anos. Houve alta taxa de sedentarismo e foi maior em indivíduos com idade superior a 80 anos.

PALAVRAS-CHAVE: Idoso. Acidente por quedas. Exercício. Equilíbrio postural.

ABSTRACT | INTRODUCTION: Aging is characterized by the progressive decline of all physiological processes, which results in alterations of all organs and systems, generating loss of muscular strength and deficit of balance. These processes can be aggravated if the individual is physically inactive. **OBJECTIVE:** to evaluate the level of physical activity and risk of falls in institutionalized elderly. **METHODS:** This is a cross-sectional quantitative study performed with the 24 elderly people living in an ILPI, in the city of São Paulo. In order to evaluate the balance, the Berg Balance Scale and the assessment of the physical activity level, using the IPAQ, were used. **RESULTS:** the frequency of falls in the last 3 months was 16.66% and for the last year 20.83%. Older people with institutionalization time of less than 5 years present a higher risk of falls than older people with longer institutionalization time. Regarding walking, we observed that 41.66% of the men wandered, which is higher than the female sex. Regarding the balance, it was observed that 83.33% of the total of the elderly presented balance deficit, being of these 50% with 80 years or more. In relation to the IPAQ, 87.5% of the elderly were classified as sedentary. **CONCLUSION:** Based on this study, it was possible to conclude that, elderly people living in this ILPI have a high risk of falls, and this risk is higher in elderly women and institutionalized elderly individuals less than 5 years of age. There was a high rate of sedentary lifestyle and it was higher in individuals older than 80 years.

KEYWORDS: Elderly. Accident by falls. Exercise. Postural equilibrium.

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Introduction

Aging is characterized by the gradual and progressive decline of all physiological processes, which is determined genetically and can be influenced by the environment and life habits[1]. With aging, there are changes to muscle strength, flexibility, balance, agility, marching speed and cardiorespiratory fitness. If the individual is not physically active, such changes can have negative impact, showing functional changes as balance deficit and greater propensity to falls[2]. A physical activity is considered to be any body movement that produces muscle contraction and energy expenditure, including the activities of daily living, work and leisure[3]. In this way, individuals who do not perform or perform few physical or sports activities are characterized as sedentary. The institutionalized elderly person manifests different characteristics of the elderly in the community. He/she shows a greater degree of sedentary lifestyle, immobility, a more pronounced decrease in functional capacity, consequently a marked degree of dependence[4,5].

One of the most serious consequences of aging is falling, which is a frequent event and a limiting factor in the life of an elderly[6]. Accidents resulting from falls, in or out of the house, are the fifth cause of death among the elderly, being that falls are responsible for 70% of these deaths. In long-terms institutions of the elderly (LTIE) falls rates are more than twice as high when compared to non-institutionalized elderly[7].

Falls can occur due to multiple causes and may be due to intrinsic or extrinsic factors. Among the intrinsic factors are physiological changes, pathological conditions and concomitant use or adverse effects of medication, and extrinsic factors include environmental hazards and inadequate footwear[8].

The greatest problem around the lack of practice of physical activity is the increased incidence of hypokinetic pathologies, fragility syndrome, the number of falls and the hospitalization[5,9,10].

It is known that falls reach approximately 32% of elderly people aged 65-74 years and 51% of the elderly over 85 years, with 30% of the elderly in Western countries suffering at least one fall a year and that this event triggers a high social cost, reduces autonomy of the elderly, greater propensity for dependence, high risk of injury, anxiety and depression, fear of a new episode of fall, social isolation and significant worsening of the quality of life of the elderly. So it becomes important to know and evaluate the risk factors of falls in the elderly[11,12].

As reduction of muscle strength, flexibility, mobility and balance deficit contribute to an increased risk of falls in the elderly, an increase in the level of physical activity is effective in preventing this event[11,12].

Thus, the aim of this study is to evaluate the level of physical activity and the risk of falls in institutionalized elderly individuals.

Methods

Cross-sectional quantitative study, approved by the Research Ethics Committee of the Federal University of São Paulo, under opinion number 2.521,244.

All the 24 elderly individuals institutionalized in Pró + Vida São Sebastião Institute - Casa Divina Providência - Institution of Long Stay for the Elderly, in the city of São Paulo, were evaluated.

In order to evaluate the balance, the Berg Balance Scale was translated and adapted for Brazil[14]. This scale is composed of 14 tasks divided into three sets that evaluate static equilibrium, load transfers and dynamic balance. Each task will receive scores ranging from 0 to 4, with a maximum score of 56 points, with a cut of 45 points as indicative for future eventual risk of falls[13].

The range comprises the following tasks

1 – transfer from a sitting position to standing; 2 – Remain standing without support; 3-Stay seated without back support with feet on the ground; 4-move the standing position for seated; 5-transfer from a chair with armrest for a without armrest and return; 6-stand with eyes closed; 7-stand with feet together; 8-standing position, with the arm positioned 90 degrees, the person will be directed to tilt the

body forward as much distance as possible. Will be measured in centimeters, the offset of the arm to the front; 9-standing position, the person will be directed to pick up an object on the floor; 10-standing position, the person will be oriented to turn without taking the feet off the ground, and looking over his left shoulder; 11-standing position, the person should revolve around yourself, i.e. 360 degrees to both sides; 12-In standing position, without support, position the feet alternately on a step or bench; 13 – In standing position, place one foot in front of the other and remain 30 seconds; 14-standing position, remain with one-legged support for as long as the person can.

Physical activity level assessment was performed through the International Physical Activity Questionnaire (IPAQ), short version validated in Brazil[15]. The questionnaire consists of 8 questions that involve activities at work, at home, the form of locomotion and leisure activities Each category consists of the following variables: very active: individual who performed vigorous activity: ≥ 5 days/wk and ≥ 30 minutes per session or vigorous activity ≥ 3 days/wk and ≥ 20 minutes per session + moderate or walk 5 days/no ≥ and ≥ 30 minutes per session; Active: individual who performed vigorous activity ≥ 3 days/wk and ≥ 20 minutes per session or moderate or ≥ 5 days/no walk and ≥ 30 minutes per session or any activity added: ≥ 5 days/wk and ≥ 150 minutes/week (moderate + vigorous walk +); irregularly active one that performs physical activity, however, in order to be classified as active because it does not comply with the recommendations regarding the frequency or duration. To perform this classification, the frequency and duration of the different types of activities are added (moderate + vigorous walking); sedentary who did not perform any physical activity for at least 10 minutes[14].

Results

In table 1, it is noticed that the average age of institutionalized elderly was 81.13 ± 7.61 years, among these 11 seniors were male and 13 female. The average time of institutionalization of the elderly in total was 0.60 ± 4.60 years.

Table 1. Profile of the institutionalized elderly, for the variables: age and time of institutionalization, according to sex and total (N = 24)

Variables	Male			Female			Total		
	N	Average	DP	N	Average	DP	N	Average	DP
Age (years)	11	76,91	6,07	13	84,38	7,22	24	81,13	7,61
Institutionalization time (years)	10	4,66	4,36	13	3,92	3,01	23	4,60	0,60

Table 2 shows the frequency of falls of the institutionalized elderly in the last three months and in the last year, difficulty or not for walking and percentage of elderly people who walk or not. We noticed that the index of falls of the elderly institutionalized in the last 3 months was 16.66% and in the last year of 20.83%. The elderly males had higher percentage of falls last year 37.50%. For falls in 3 months, both males and females presented similar percentiles of falls 41.66%. Regarding walking, 41.66% of men walk, and this percentage is higher than that of women performing the same function. Among the elderly that walk, 35.2% of males present difficulty to perform the function while 23.53% of women perform the function with difficulty.

Table 2. Frequency and percentage of the profile of the institutionalized elderly, for the variables: falls and walk, according to sex and total (N = 24)

Variables	Male		Female		Total	
	N	%	N	%	N	%
Falls in the last three months (n° of times)						
Yes	1	4,16	3	12,75	4	16,66
No	10	41,66	10	41,66	20	83,33
Falls in the last year (n° of times)						
Yes	2	8,33	3	12,50	5	20,83
No	9	37,50	10	41,66	19	7,16
Walking						
Yes	10	41,66	7	29,16	17	70,83
No	1	4,16	6	25,00	7	29,16
Difficulty to walk						
Yes	6	35,29	4	23,52	10	58,82
No	4	23,52	3	17,54	7	41,17

thls study, we observed that 83.33% of the total elderly had a deficit of balance and difficulty to carry out the activities proposed by the BERG Scale, of which 50% were elderly with 80 years or more and 33.33% of the elderly between 60 and 79 years old.

Table 3 shows the results obtained for each task of the BERG Scale according to age and total of the elderly.

Among the tasks performed on the BERG scale, it is observed that the elderly had difficulty performing the following tasks: Positioning the feet alternately on a step or bench (70.83%); Standing on one leg (66.66%); Reach forward with outstretched arm remaining standing (62.50%); Standing without support with one foot forward (62.50%); Get an object on the floor from the standing position (54.16%); Standing without support with the feet together (50.00%); Standing without support with eyes closed (45.83%); Standing without support (41.66%); Rotate 360° (41.66%); Standing position to seated position (37.50%); Transfers (37.50%); A seated position to standing position (33.33%); Turn around and look over their shoulders left and right while remaining standing (33.33%). The elderly easily performed only the task of sitting without back support, but with their feet resting on the floor or on a bench (50.00%).

According to the data obtained through the BERG scale, we can observe that the elderly with age range of 60-79 obtained better performance in performing the following tasks: seated position for standing position, standing position for seated position, reaching forward with the arm extended, picking an object from a standing position, remain standing on one leg, in relation to the elderly with age over 80 years old.

Table 3. Balance in institutionalized elderly, following the Berg Balance Scale, according to age and total (to be continued)

Variables	60 - 79 years N	%	80 and over N	%	Total N	%
Seated position for standing						
Able to stand up without using hands to lean	4	16,66	3	12,5	7	29,16
Able to stand up independently using hands	1	4,16	5	20,8 3	6	25,00
Able to stand up using hands after several attempts	2	8,33	0	0,00	2	8,33
Need minimal help to stand up or to stabilize	0	0,00	1	4,16	1	4,16
Need moderate or maximum help to stand up	3	12,55	5	20,8 3	8	33,33
Standing without support						
Able to stand safely for 2 minutes	4	16,66	4	16,6 6	8	33,33
Able to stand for 2 minutes with supervision	1	4,16	2	8,33	3	12,50
Able to stand for 30 seconds without support	1	4,16	1	4,16	2	8,33
Need several attempts to stand for 30 seconds without support	0	0,00	1	4,16	1	4,16
Unable to stand for 30 seconds without support	4	16,66	6	25,0 0	10	41,66
Remain seated without back support, but with feet resting on the floor or on a bench						
Able to remain seated safely and firmly for 2 minutes	6	25,00	6	25,0 0	12	50,00
Able to remain seated for 2 minutes under supervision	0	0,00	1	4,16	1	4,16
Able to remain seated for 30 seconds	2	8,33	2	8,33	4	16,66
Able to remain seated for 10 seconds	0	0,00	0	0,00	0	0,00
Unable to remain seated without support for 10 seconds	2	8,33	5	20,8 3	7	29,16
Standing position for seated position						
Sits securely with minimal use of hands	4	16,66	3	12,5 0	7	29,16
Controls the descent using hands	1	4,16	2	8,33	3	12,50
Use the back of the legs to control the descent	0	0,00	3	12,5 0	3	12,50
Sits independently, but has descent without control	2	8,33	0	0,00	2	8,22
Need help to sit down	3	12,5	6	25,0 0	9	37,5 0
Transfers						
Able to transfer safely with minimal use of hands	4	16,66	4	16,6 6	8	33,3 3
Able to transfer safely with use of the hands	1	4,16	2	8,33	3	12,5 0
Able to transfer following verbal guidelines and / or supervision	1	4,16	2	8,33	3	12,5
Need a person to help	1	4,16	0	0,00	1	4,16
Need two people to help or supervise to perform the task safely	3	12,50	6	25,0 0	9	37,5 0
Standing without support and with eyes closed						
Able to stand for 10 seconds safely	2	8,33	5	20,8 3	7	29,1 7
Able to stand for 2 minutes with supervision	3	12,50	2	8,33	5	20,8 3
Able to stand for 3 seconds	0	0,00	0	0,00	0	0,00
Unable to keep stand with eyes closed for 3 seconds, remain standing	0	0,00	1	4,16	2	4,16
Need help not to fall	5	20,83	6	25,0 0	11	45,8 4
Remain standing with feet together, without support						
Able to position feet together and stay for 1 minute safely	2	8,33	3	12,5 0	5	20,8 3
Able to position feet together and stay for 1 minute with supervision	2	8,33	1	4,16	3	12,5 0

Table 3. Balance in institutionalized elderly, following the Berg Balance Scale, according to age and total (continuation)

Variables	60 - 79 years N	%	80 and over N	%	Total N	%
Able to position feet together independently and stay for 30 seconds	1	4,16	1	4,16	2	8,33
Need help to position, but only remain with the feet together for 15 sec	1	4,16	1	4,16	2	8,33
Need help to position is unable to remain in this position for 15 sec '	4	16,66	8	33,33	12	50,00
Reach forward with outstretched arm, standing						
Can move forward more than 25 cm safely	2	8,33	1	4,16	3	12,50
Can move forward more than 12.5 cm safely	0	0,00	2	8,33	2	8,33
Can move forward more than 5 cm safely	1	4,16	1	4,16	2	8,33
Can move forward but need supervision.	1	4,16	1	4,16	2	8,33
Lose balance in the attempt, or need external support	6	25,00	9	37,50	15	62,50
Get an object from the ground from a standing position						
Able to get the slipper easily and safely	3	12,50	1	4,16	4	16,66
Able to pick up the slipper, but need supervision	0	0,00	3	12,50	3	12,50
Unable to pick it up, but stretch until it is 2-5 cm from the slipper and maintains balance	1	4,16	0	0,00	1	4,16
Unable to pick it up needing supervision while trying	2	8,33	1	4,16	3	12,50
Unable to try, need help not to lose balance or fall	4	16,66	9	37,50	13	54,16
Turn around and look back over right and left shoulders while standing						
Look back on both sides with good weight distribution	2	8,33	4	16,66	6	25,00
Look back only on one side, the opposite side demonstrates <weight distribution	1	4,16	0	0,00	1	4,16
Turns only to the sides, but keeps the balance	1	4,16	2	8,33	3	12,50
Needs supervision to turn	3	12,50	3	12,50	6	25,00
Need help not to lose balance or fall	3	12,50	5	20,83	8	33,33
Rotate 360 degrees						
Able to rotate 360 degrees safely in 4 seconds or less	2	8,33	3	12,50	5	20,83
Able to rotate 360° only to one side in 4 seconds or less	0	0,00	0	0,00	0	0,00
Able to rotate 360 degrees safely, but slowly	1	4,16	1	4,16	2	8,33
Need close supervision or verbal guidelines	3	12,50	4	16,66	7	29,16
Need help while rotating	4	16,66	6	25,00	10	41,66
Position the feet alternately on the step or bench while standing unsupported						
Able to stand independently, completing 8 moves 20's	1	4,16	2	8,33	3	12,50
Able to remain stand and to complete 8 movements in more than 20 seconds	0	0,00	0	0,00	0	0,00
Able to complete 4 movements without help	1	4,16	0	0,00	1	4,16
Able to complete more than 2 moves with minimal help	1	4,16	2	8,33	3	12,50
Unable to try, or need help not to fall	7	29,16	9	37,50	17	70,83
Standing without support with one foot forward						
Able to place a foot in front of the other and to remain for 30 s'	1	4,16	1	4,16	2	8,33
Able to place a foot a little more in the front of the other and lightly aside and remain for 30 s'	0	0,00	1	4,16	1	4,16
Able to give a small step, independently, and to remain for 30s'	2	8,33	0	0,00	2	8,33

Table 3. Balance in institutionalized elderly, following the Berg Balance Scale, according to age and total (conclusion)

Variables	60 - 79 years N	%	80 and over N	%	Total N	%
Need help to step, however 15 seconds	2	8,33	2	8,33	4	16,6 6
Lose balance when trying to step or to stand up	5	20,83	10	41,6 6	15	62,5 0
Stand in one foot						
Able to raise a leg independently and to remain for more than 10s'	1	4,16	0	0,00	1	4,16
Able to raise a leg independently and to remain for 5-10s'	0	0,00	1	4,16	1	4,16
Able to raise a leg independently and to remain for 3 seconds	0	0,00	1	4,16	1	4,16
Try to raise a leg, but is incapable to remain for 3 seconds, even so remains stand independently	3	12,50	2	8,33	5	20,8 3
Unable to try, or need help not to fall	6	25,00	10	41,6 6	16	66,6 6
Total score BERG						
Without risk of falls	2	8,33	2	8,33	4	16,6 6
With risk of falls	8	33,33	12	50,0 0	20	83,3 3

Regarding the risk of fall of the institutionalized elderly, 83.33% of the total of the elderly present a risk of falls. When related to institutionalization time, 50% of the institutionalized elderly with less than 5 years are at risk of falls, while 29.16% of the institutionalized elderly for more than 5 years are at risk of falls.

Table 4. Balance in institutionalized elderly, following the Berg Balance Scale, according to institutionalization time

Variable	0-5 years N	%	>5 years N	%	Total N	%
Total score BERG						
<45 points With Risk of falls	12	50,00	7	29,16	19	83,33
≥ 45 points Without risk of falls	1	4,16	3	12,50	4	16,66

In the table 5 we can see that the level of physical activity practiced by elderly people in this long-stay institution is very low or nothing, since the data obtained by means of IPAQ (international physical activity questionnaire) shows that 87.5% of the total of elderly assessed were classified as sedentary. There was a higher percentage of sedentary lifestyle in individuals with age equal to or over 80 years (58.33%), while elderly people between 60 and 79 years 33.33% were classify as sedentary.

Table 5. Level of physical activity according to the International Questionnaire of Physical Activity (IPAQ) in institutionalized elderly, according to age and total

Variable	60 - 79 years N	%	80 and over N	%	Total N	%
IPAQ						
Very active	0	0,00	1	4,16	1	4,16
Active	0	0,00	0	0,00	0	0,00
Regularly active	2	8,33	0	0,00	2	8,33
Sedentary	8	33,33	14	58,33	21	87,50

Discussion

The average age of the elderly living in this long-term institution was 81.13 years, similar to other studies in which the average number of institutionalized elderly people is greater than 80 years old[7, 15]. The average time of institutionalization of the elderly in LTIE'S in this study was of 4.6 years, corroborating with other studies present in the literature in which the average time varies from 4 to 8 years of institutionalization[16, 17].

According to the data obtained in this study we observed that the report of falls in the last three months was 16.66% and in the last year was 20.13%, while in other studies it was 12% for the last 30 days 7 and 64,71% in the last year[18]. The high prevalence of falls can be justified by the institutionalization itself, since this represents an important fall risk factor according to the literature[7,18]. Other important factors for risk of falls in elderly discussed in other studies are: muscle weakness of the lower limbs, recurring falls, cardiovascular and psychotropic drugs, disorders of balance, visual impairment and dementia, chronic disease, emotional and neurocognitive, absence practice of physical activity and age, are intrinsic risk factors for risk of falls[19,20,21]. We also found extrinsic risk factors like quality of housing, level of social interaction, community resources and environmental factors[22].

A greater number of falls were observed in females, which is explained by other studies in which there is also a predominance of falls of older women in relation to males due to the reduction of more muscular mass in elderly females than in males[23].

With the gradual decline of physiological functions caused by the aging process, the elderly may present difficulty in performing daily life activities as walking[3,24]. In this study we observed that 70.83% of the institutionalized elderly walk, however, 58.82% had difficulty to march, according to other studies found in the literature this is due to physiological changes from aging, as reduction of muscle strength, flexibility, speed of motion, march cadence, stride length, base width increase, reducing the number of muscle fibers in special type II fibers and muscle power, longer stay in double support, reduction of bone mass, the speed of nerve conduction, the intensity of the reflections, the motor responses and coordinating capacity[1,3,23,24]. Other factors that may have important impact on the march, causing problems to walk, are the skeletal muscles disorders as joint pain, osteoarthritis and joint stiffness, causing chronic reduction of the speed of the march and illnesses[3,23].

In this study we found that the elderly present 83.33% deficit of balance and difficulty of performing the tasks proposed by the scale of BERG, data this that meet with other studies[14,15.] The balance deficit presented by the elderly during the assessment can be explained by the decline that occurs in the body control system, which unites information from the vestibular system, the somatosensory system and the visual receptors[16]. According to other studies, all body systems show numerous changes during the aging process, thus generating gradual decline of the functions performed by the elderly individual, with a predominant negative impact on the elderly who do not practice physical activities[1,4,5,16].

The data obtained through the Berg Balance Scale, showed that the elderly presented difficulty in performing the tasks proposed by the scale of Berg. It is known that the elderly present altered postural control, and that this is determined by sensorial (ie, vestibular, visual and proprioceptive) degradations of the motor system and by adaptive deficits[24], corroborating with this we observed greater difficulty of the elderly in performing the following tasks that require balance during execution: positioning the feet alternately on a step or bench, standing on one leg, standing without support with one foot forward; standing with feet together, stand without support with eyes closed, rotate 360° and turn and look over right and left shoulders while standing.

The loss of muscle mass, strength and contractile power trigger in the elderly difficulties to perform the following tasks of standing without support, from standing position to seated position and from seated position to standing position[1,25].

According to the literature during the aging process there is reduction of length, elasticity, number of muscle fibers, deficits of the sensory and adaptive systems which explains the difficulty of the elderly in

accomplishing the task of reaching forward with the extended arm, standing[1,25].

It was observed in the literature, reduction of coordination in focused brain regions suggesting integrative global loss with aging[25], reduction of sensory cells, increase in joint stiffness, reduction of tendons and ligaments elasticity and tendon and ligament viscosity, and in addition is noted reduction of the muscle strength, capacity[1,25], making it more difficult to perform the following tasks picking an object on the ground from the standing position and transfers.

The prevalence of falls in several studies varies between 30-50% per year, data this that goes against what has been observed in this study, since we find that elderly with time of institutionalization of 0 to 5 years presented a risk of falls of 50% while the institutionalized elderly to more than 5 years presented a risk of falls of 29.16%.

An important data that other studies present as to the risk of falls in institutionalized elderly is the impact caused by environmental factors (such as stairs, narrow aisles, carpets), relating directly to the physical condition of the individual and the physical environment in which it dwells[15], however the data obtained through work does not corroborate with it once the institution where the collection is all adapted the needs of locomotion of the elderly.

Institutionalized elderly non-practitioners of physical activity have higher prevalence of falls[16,21]. The reduction of the practice of daily living activities, the lack of physical exercise programs and physical therapy in long-stay institutions justifies this data[16]. These data corroborate with other studies that show that LTIE can lead to reduction of the functional independence of the elderly, because it is necessary to optimize the time of service to the elderly and this way it ends up reducing the incentive for elderly to perform the tasks that still have conditions to develop alone[16]. Studies found that the less involvement with daily life activities reduces muscle strength, march capacity and physical fitness[15]. In this way, it is suggested the need for interventions for prevention and health promotion, through the practices of physiotherapy and physical education professionals, within the LTIEs, in order to improve functional capacity, by increasing the level of physical activity and reduction of the risk of falls in the elderly.

Conclusion

From this study is possible to conclude that elder resident in this LTIE presented high risk of falls, being this risk higher in elderly female and in those with less than 5 years institutionalized. Also, we proved there is high rate of sedentary lifestyle and that this is higher in individuals over the 80 years, making it necessary to develop interventions aimed to improve the balance of the elderly, reducing the risk of falls and the rate of sedentary lifestyle among these elderly people.

Author contributions

Alves RA participated in the conception of the study design, data collection, statistical analysis, interpretation of results and writing of the manuscript. Lombardi Junior I participated in the conception of the study design, interpretation of the results and writing of the manuscript. Agner VFC supervised the study, participated in the conception of the study design, data collection, statistical analysis, interpretation of the results and writing of the manuscript.

Competing interests

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