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Informal caregivers of older people recovering from surgery for hip fractures caused by a fall: fall prevention

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Abstract *The objectives of this study were to investigate the sociodemographic characteristics of informal caregivers of elderly persons who had undergone surgery for hip fractures caused by a fall, explore the level of caregiver's knowledge regarding fall prevention, and assess the relationship between this knowledge and the use of preventative measures in practice. This investigation consists of a cross-sectional study using nonprobability sampling methods conducted over a period of 12 months and involving 89 caregivers. The majority of caregivers were female (76.4%) and sons or daughters of the patients (64%). Environmental modification was the predominant preventative measure used by caregivers (88.2%). 58.1% of caregivers believed it was possible to prevent falls in the elderly and there was a significant association (p = 0,002) between believing it was possible to prevent falls and carrying out modifications in the home and/or to the daily routine of the older person. Informal caregivers with wide or partial knowledge of fall prevention put preventative measures into practice. These findings demonstrate that the number of falls among older persons could be significantly reduced if health care programmes widened their actions to include the guiding principles of the WHO falls prevention model.*

Key words *Elderly, Accidental falls, Caregivers, Hip fractures*

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Introduction

Falls in the elderly constitute a public health problem since they are a significant cause of morbidity and mortality and pose a social and economic burden[1]. Effects range from loss of walking confidence to fear of falling again. Falls therefore result in mobility deficits, increased dependence and risk of injuries such as proximal femoral fractures (hip fractures)[2-3].

The most common form of treatment for hip fractures in the elderly is surgery and the rehabilitation process after hip fracture surgery includes help from an informal caregiver, otherwise denominated by the literature as a family caregiver[4].

Given that caring for the elderly can be challenging, since it can lead to role overload[5], and that the continuity of home care is essential to the success of treatment and the rehabilitation process, the role of healthcare professionals in re-establishing functional independence and promoting the health of the dependent older adult-family caregiver dyad is essential.

When planning and implementing interventions aimed at developing the self-care skills and competencies, professionals should consider the necessary knowledge and information for the older person and caregiver to adequately manage their health condition[6]. This information can be in the form of explicit knowledge[7], from texts, books and formal documents, and tacit knowledge, which arises from personal experience[8].

The ideal approach to health education is that which seeks to break with the biomedical model and embrace health promotion as a way of bringing about social change, through raising critical awareness of health issues in the general population and social groups and involving them in their *health* and *health*care[9].

Furthermore, it is important to emphasise that educating informal caregivers about falls and fall prevention is particularly challenging since it involves building the skills and competencies required for home care and therefore goes beyond simple guidance on discharge. Research suggests that the older person and caregiver should receive support beyond the initial transitional period after discharge, since this is when difficulties which the caregiver is often unprepared to deal with arise[10].

The rehabilitation process, and consequently the reestablishment of the independence of an older person who has undergone hip fracture surgery, is highly dependent on the quality of care provided by the family caregiver. However, a hip fracture is considered an acute event and often caregivers do not have enough time to develop the necessary skills and competencies to provide adequate care and help prevent the person from falling again.

In light of the above, this study aims to investigate the sociodemographic characteristics of informal caregivers of elderly persons who had undergone surgery for hip fractures caused by a fall, explore the level of caregiver's knowledge regarding fall prevention, and assess the association between this knowledge and the actual use of preventative measures in the daily routine of the older person, in order to assess the minimum level of knowledge required to encourage carers to use preventative measures.

Methodology

This investigation consists of a cross-sectional study using nonprobability sampling methods conducted between November 2011 and October 2012. The sample comprised caregivers of elderly people who had undergone surgery for hip fractures caused by a fall in the *Hospital das Clínicas de Botucatu*, São Paulo, Brazil. The study was approved by the Research Ethics Committee at the *Hospital das Clínicas*.

Data was collected from informal caregivers in the orthopaedic outpatient department during the post-operative appointment using a form designed by the researchers containing questions about sociodemographic characteristics (sex, age, place of residence, relationship to elderly the person) and knowledge about fall prevention and the use of preventative measures by the informal caregivers in the daily routine of the older person: whether the caregiver possessed knowledge about fall prevention (yes/no); whether he or she believed it was possible to prevent falls in the elderly (yes/no); whether he or she felt supported in their caring responsibilities (yes/no); and if the caregiver had to make any changes to his or her life style (time away from work, leisure activities, social life, etc..) (yes/no). Remunerated caregivers were excluded from the study.

The WHO Global Report on Falls Prevention in Older Age was used to provide a theoretical basis for the questions addressing caregivers' knowledge regarding fall prevention[11]: muscular strength, physical environment modifications to reduce the risk of falls (including those related to improvement of lighting in the home, bed height, bathroom grab bars, review of uneven or slippery

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surfaces and social isolation), modification of medications (review of daily medication needs by a geriatric physician, vitamin D and calcium supplementation, when necessary), monitoring of associated diseases and complications (neurological, cardiologic, osteomuscular, mental etc..), modifications to ameliorate decline in sensory functioning, support regarding fear of falling and encouragement to retake normal daily activities. The caregiver was asked questions and his or her responses were categorised. The caregiver was considered to have the minimum required level of knowledge about fall prevention if he or she mentioned at least one of the criteria proposed by the WHO[11].

The data was inputted into an Excel spreadsheet and analysed using the software package SPSS V15.0 and R V2.11.0. The association between home and lifestyle modifications and likelihood of preventing falls was analysed using the chi-squared test and adopting a significance level of $p < 0.05$.

Results

The sample was composed of 89 informal caregivers, the majority of which were women (76.4%). Men accounted for 23.6% of the sample and 25.8% of the caregivers were older persons (Table 1). Table 2 shows that 42.7% of caregivers stated that they had knowledge of fall prevention. This knowledge was generally acquired from magazines and journals or from past experience of caring and only 14.6% of caregivers had received guidance from health professionals. With respect to fall prevention, 48.3% of caregivers believed it was possible to prevent falls in the elderly, while 51.7% thought it was not. Physical environment modifications (installing bathroom grab bars, removing mats, and others) were the most commonly cited preventative measures.

With regard to support from other family members, 58.4% considered that there was an adequate division of tasks within the family unit and 41.7% stated that they felt alone and unsupported. A finding that deserves special attention is the fact that 87.6% of family caregivers experienced changes in their daily routine after the older person suffered the fracture, including loss of leisure time, time away from work and reorganisation of the family routine (Table 2).

Table 3 shows that there was a significant association ($p = 0{,}002$) between knowledge of fall prevention and home and lifestyle modifications: 58.1% (n = 43) of the caregivers who thought fall prevention was possible confirmed making modifications, while only 26.1% (n = 46) of those who thought that falls were unpreventable mentioned having made some kind of change in the older person's home and/or lifestyle.

Discussion

The majority of the caregivers were women (76.4%). The age of the caregivers ranged between 22 and 75 years and 25.8% of the sample were aged 60 years and over. The literature on this subject shows that care of elderly people who have undergone surgery for hip fractures is generally provided by a female member of the family[12-13], and highlights the role of the spouse[12] and elderly caring the elderly[14]. The present study showed the predominance of daughters as caregivers, corroborating the findings of a study, which found that 64% of older persons were cared for by their sons or daughters, 12.4% by their spouse, 5.6% by grandchildren, and 4.5% by a sibling. It is important to highlight that the number of men taking on the responsibility of

Table 1. Sociodemographic characteristics of informal caregivers for the elderly after operating for proximal femoral fracture. Hospital das Clínicas de Botucatu. Brazil. 2012.

Variables	n	% Relative
Sex		
Female	68	76.4
Male	21	23.6
Age (years)		
< 60	66	74.2
≥ 60	23	25.8
Kinship		
Child	57	64.0
Partner	11	12.3
Grandchild	5	5.6
Niece/Nephew	5	5.6
Daughter-/ son-in-law	5	5.6
Other	6	6.9
Years of study		
< 1 year	2	2.2
1 a 5 years	36	40.5
6 a 9 years	13	14.6
≥ 10 years	38	42.7
Origin		
Botucatu	47	52.8
Other cities	42	47.2

caring is increasing, as shown by a recent study conducted in Portugal[15]. This is perhaps due to the fact that men find themselves obliged to take on this role due to the deficit of women in the family.

This study showed that 57.3% of informal caregivers mentioned not having any knowledge of fall prevention and 85.4% stated not having received any guidance from health professionals. Although knowledge is a prerequisite for self-care, it is not necessarily the only or main factor involved in the education process. In order to promote changes in behaviour, due consideration must be given to other factors such as level of education, time since diagnosis, beliefs related to health and illness, family support, and ease of access to health services[16].

The findings of this study show that informal caregivers are still not fully integrated into the care process, given that only 14.6% stated having received guidance on fall prevention from healthcare professionals. Education is an important strategy for building capacity of families to ensure effective care and fall prevention. This is a multifaceted field in which diverse concepts converge in both the education and health areas. These concepts mirror different insights into the world, man and society. There is a need to build awareness and develop a critical attitude in order to change reality. This requires scientific and technical knowledge, commitment, involvement and continuity of health care[7].

The results show that 88.2% of the caregivers that believed it was possible to prevent falls mentioned physical environment modifications as the only form of fall prevention, while 11.8% of caregivers also mentioned muscular strength and vitamin D supplementation, when necessary, or the resolution of comorbidities that make older persons more susceptible to falls. The literature shows that the physical environment or inappropriate practices (slippery floor, objects lying on the floor, climbing objects to try and reach something, bumping into other people, steps, and falling out of bed) account for 54% of all falls[17]. However, it is necessary to provide guidance to caregivers about other fall risk factors so that they do not become frustrated with the care process, especially if the older person suffers new falls.

Table 2. Knowledge presented by informal caregivers of the elderly after operating proximal femoral fractures from falls. Hospital das Clínicas de Botucatu. Brazil, 2012.

Variables	n	% Relative
Deemed to have knowledge about prevention of falls among the elderly		
Yes	38	42.7
No	51	57.3
Received guidance from a health professional about prevention of falls among the elderly		
Yes	13	14.6
No	76	85.4
Considers possible the prevention of falls among the elderly		
Yes	43	48.3
No	46	51.7
Knowledge mentioned* (n = 51)		
Modification of the physical environment	45	88.2
Muscule Strenghening	3	5.9
Aderence to Medication	2	3.9
Treatment of other conditions	1	2.0
Receives social support from family		
Yes	52	58.4
No	37	41.6
Changes in your daily routine after a fracture suffered by the elderly person		
Yes	78	87.6
No	11	12.4

* Caregiver could provide more than one answer.

Table 3. Association between considering possible the prevention of falls in the elderly and the modifications carried out in the home or life of the elderly person according to the informal caregiver. Hospital das Clínicas de Botucatu. Brazil, 2012.

Thinks it possible to prevent falls among the elderly	Change in life or home for the older person	Values-p
No (n = 46)	12 (26,1%)	0,002*
Yes (n = 43)	25 (58,1%)	

* Chi-square.

Health education should be continuous. A study carried out in Cuba with family members of dependent older persons who lacked sufficient knowledge of patient care, showed that 85.48% of the sample correctly answered relevant questions on the subject after the implementation of a health education intervention[18]. Another study showed that older persons whose caregivers confirmed the need for information about care were more likely to restore walking skills than those whose caregivers did not mention this need[19].

The present study shows that knowledge of fall prevention, regardless of whether it is complete or not, was associated with the use of preventative measures, showing the importance of providing caregivers with the necessary guidance. International studies show that informal caregivers experience difficulties in providing adequate homecare despite receiving guidance from the medical or nursing team before discharge[12,19].

Given that regaining functional independence can be a slow process and may not occur, caregivers and older persons who have suffered a hip fracture should be encouraged to avoid falling. The fear of falling again and suffering another hip fracture means that certain measures are often adopted, such as removing the elderly person from his or her home, carrying out home modifications, the use of mobility devices, and changes in walking pace and style. A study in Brazil showed that in the absence of adequate physiotherapy older persons who have experienced falls are likely to be less mobile and consequently at greater risk of falling again[20]. However, cultural beliefs mean that falls are often seen as inevitable and unavoidable consequence of ageing, and therefore trivialised, and as a result modifications are often not made. Furthermore, lack of knowledge of fall prevention and treatment can lead to increased risks for the health of both the older person and caregiver. A study that assessed the functional independence of older persons with a hip fracture at admission to hospital, at discharge, and at one month at home after discharge, observed considerably greater average total functional independence measure and functional independence measure motor values at discharge than at admission. However, average total functional independence measure values at home were lower than those observed at discharge[21]. This decline in functional independence at home may be explained by the following: a lack of physiotherapy treatment; overprotective families who do everything for the older person, either because they consider him or her incapable of undertaking these activities, or as way of expressing their care and affection for the person who is convalescing; or by home hazards which hinder mobility and the carrying out of daily activities[21].

The majority of caregivers confirmed receiving social support from other family members and having to make changes to his or her life style, corroborating the findings of a national study which explored the characteristics of social support received by informal caregivers of dependent older persons[22]. This study highlighted the role of the patient's children, who provide financial support and assist with personal hygiene activities, feeding, and transport on a regular and constant basis[21]. A cross-sectional study carried out in 59 cities in a state in Brazil involving 6,751 older people observed that those individuals who participated in a social activity were at lower risk of falling, emphasising the importance of building the capacity of caregivers to prevent falls[23].

Homecare is considered a continuation of the care provided by the nursing team, and these professionals are responsible for providing support and building the capacities of families. Guidance alone is not sufficient; it is necessary to understand the patient's reality and carry out individualized care planning which fully involves the caregiver. Effective strategies need to acknowledge that the follow-up of the family caregiver and older person should occur not only at post-operative appointments, but also at the home, and that this service should be provided by the health professionals that treat this population in the community under the Family Health Strategy.

The limitations of this study are associated with the intentional sampling method used and the use of a validated instrument to measure knowledge of fall prevention. However, the study shows that the relation between building capacities of caregivers and fall prevention deserves further research based on studies using other methodological approaches.

Finally, this study contributes by demonstrating that the number of falls among older persons could be significantly reduced if health care programmes widened their actions to include the guiding principles of the WHO falls prevention model. To effectively address this issue and reduce the risk of falls it is necessary to adopt a multidimensional approach, which is only possible through the integrated and specialised actions of a multidisciplinary-team[24]. This approach is built on three closely interrelated and mutually depen-

dent pillars: building awareness of the importance of falls prevention and treatment; improving the assessment of individual, environmental, and societal factors that increase the likelihood of falls; facilitating the design and implementation of culturally-appropriated evidence-based interventions that will significantly reduce the number of falls among older persons[25].

Conclusions

Care of older persons undergoing rehabilitation after hip fracture surgery is mainly provided by women (76.4%) and the patient's son(s) or daughter(s) (64%). The findings show that 42.7% of caregivers have knowledge of fall prevention, while 88.2% cited environmental modifications as the only form of fall prevention. Only 14.6% of caregivers received guidance on fall prevention from healthcare professionals. Informal caregivers with wide or partial knowledge of fall prevention measures recommended by the WHO put preventative measures into practice. The findings of this study suggest that strategies designed to raise awareness in the general population constitute an effective measure to significantly reduce falls in older persons.

Furthermore, it is recommended that, apart from teaching fall prevention, health professionals should seek to understand the caregiver-patient's reality and involve older people and their caregivers in all aspects of care planning to ensure individualized continuing care.

Collaborators

MAG Avila participated in project design, data collection and analysis and in the discussion and conclusion. SCM Bocchi participated in project design, data analysis, in the discussion and conclusion, and in producing the final draft of this article. GJC Pereira participated in data collection and editing the final version of this article.

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