

Consumer Products and Fall-related Injuries in Seniors

Lauren E. Griffith, PhD,¹ Nazmul Sohel, PhD,¹ Kathryn Walker, MSc PT,¹ Ying Jiang, MD, MSc,² Yang Mao, PhD,² Doug Hopkins,² Parminder S. Raina, PhD¹

ABSTRACT

Objective: To conduct an environmental scan to identify the scope of literature on consumer products and injuries in seniors and to fill in some of the information gaps by exploring the relationship between assistive devices (AD) and fall-related injuries.

Methods: The environmental scan included primary literature identified in Medline and EMBASE databases and grey literature was identified in Google and consumer product safety sites in the US, Canada, the UK, and Australia.

Weighted logistic regression was then used to examine the relationship between socio-demographic factors, frailty indicators, and AD use at the time of the fall, and the type of health services utilized and psychological consequences of the fall based on data from the 2008-2009 Canadian Community Health Survey on Healthy Aging.

Results: The majority of the articles on consumer products and injuries reported secondary database sources and did not directly link the consumer product's influence on a given injury. We found AD use at the time of a fall was associated with hospitalization, worry about re-injury, and limiting one's activities due to this worry, even after adjustment for socio-demographic variables. When frailty variables were included in the model, however, AD use was no longer statistically significant.

Conclusion: This study provides preliminary information on the relationship between AD use and fall-related outcomes. However, the current data are not sufficient to draw specific conclusions. More detailed questions regarding AD use for the entire population and additional questions regarding the contribution of the AD to the injury will help to provide a richer understanding of this relationship.

Key words: Injuries; consumer product safety; falls; elderly; aging

La traduction du résumé se trouve à la fin de l'article.

Can J Public Health 2012;103(5):e332-e337.

Approximately 23-35% of people aged 65 and older fall each year.¹⁻³ Falls in seniors account for 40% of injury-related deaths⁴ and over 80% of all injury admissions to hospital.^{5,6} Numerous reviews identifying risk factors for falls and strategies for fall prevention have been published since 2000.^{4,7-19} Intrinsic and extrinsic risk factors include demographic characteristics, social and environmental factors, co-morbidity, cognitive impairment, functional capacity, and medication use, with complex interactions among these factors.

The role of consumer products in fall-related injuries in seniors has not been comprehensively studied. Of the review articles, only Akyol¹⁴ enumerated the most important environment hazards of which some, such as electrical cords in pathways, throw rugs, and low chairs, were consumer products. Theoretically, environmental factors, such as the use of consumer products, can be modified more easily than other intrinsic risk factors related to falling. Thus, identifying classes of consumer products related to injuries could have an important public health impact.

As in other countries, there is little population-based data to examine the association between consumer products and fall-related injuries. In the 2008-2009 Canadian Community Health Survey on Healthy Aging, a module on falls was administered to a representative sample of Canadian seniors. This module included information on one particular type of consumer products, assistive devices (AD). We therefore took this opportunity to explore the available Canadian data. The objectives of this study were to: 1) conduct an

environmental scan to identify the scope and summarize the intelligence of the literature on consumer products and injuries in seniors, and 2) fill some of the information gaps identified in the environmental scan by exploring the relationship between AD and fall-related injuries in seniors using data from the Canadian Community Health Survey on Healthy Aging.

MATERIALS AND METHODS

Environmental scan

The World Health Organization definition of a fall²⁰ as “an event which results in a person coming to rest inadvertently on the ground or floor or other lower level” was used. A consumer prod-

Author Affiliations

1. Department of Clinical Epidemiology and Biostatistics, McMaster University, Hamilton, ON
2. Centre for Chronic Disease Control and Prevention, Public Health Agency of Canada, Ottawa, ON

Correspondence: P. Raina, Department of Clinical Epidemiology and Biostatistics, MIP-309A, McMaster University, 175 Longwood Rd S., Hamilton, ON L8P 0A1, Tel: 905-525-9140, Fax: 905-522-7681, E-mail: griffith@mcmaster.ca

Acknowledgements: The Canadian Community Health Survey – Healthy Aging survey content was developed by the Health Statistics Division at Statistics Canada in consultation with Health Canada, the Public Health Agency of Canada (PHAC), and experts conducting the Canadian Longitudinal Study on Aging (CLSA). Consultations included stakeholders from Human Resources and Social Development Canada and provincial and territorial health ministries. The Canadian Institutes of Health Research (CIHR) provided funding for the CLSA; and the CLSA – Mobility Initiative – An Emerging Team in Mobility and Aging, the Canada Foundation for Innovation (CFI), provided infrastructure support for the CLSA. Funding for this study was provided by PHAC.

Conflict of Interest: None to declare.

Table 1. Summary of Literature Identified in Environmental Scan

Characteristic	N (%)	Notes
Geographic Scope		
International	2 (9.5)	International: Comparison of Australia, US, UK and the Netherlands and countries within the European Union
National	10 (47.6)	National: Australia, Canada, US, Ireland
Regional	2 (9.5)	Regional: Atlantic Provinces (Canada), Västmanland County (Sweden)
State/Provincial	6 (28.6)	State/Provincial: Victoria (Australia), Massachusetts (US), Ontario (Canada)
City	1 (4.8)	City: Dublin (Ireland)
Type of Data Analyzed		
Primary	1 (4.8)	Primary Data: Telephone survey, questionnaires
Secondary	18 (85.7)	Secondary Data: Hospital discharge data, emergency department data, mortality records, retrospective chart review
Both	2 (9.5)	
Data Sources		
Mortality data	8 (38.1)	Injury Surveillance Systems: Many injury surveillance databases included data from multiple administrative databases (mortality data, hospital discharge data, and emergency department data)
Hospital discharge data	17 (81.0)	
Emergency department data	16 (76.2)	
Time off work	1 (4.8)	Time off work: Self-reported questionnaire data
Injury Type		
All unintentional injuries	8 (38.1)	Injuries: All reported injuries associated with a consumer product
Falls	12 (57.1)	Falls: All fall-related injuries associated with a consumer product
Both (comparison)	1 (4.8)	One study compared falls vs. other non-fall injuries
Consumer Products		
General	8 (38.1)	The most commonly identified consumer products related to injuries: Floors/flooring, stairs/steps, beds, chairs, rugs/carpets, ladders, footwear, outdoor structures, and housing/building materials
Ladders and/or steps and stairs	10 (47.6)	
Sports equipment	1 (4.8)	
Wheelchairs and adult walkers	1 (4.8)	
Bathroom products	1 (4.8)	Only one study reported the characteristics of the injury event, including whether product fault was the cause of the accident

uct was defined as “any article produced or distributed for sale to a consumer for use in or around a household or residence, a school, in recreation, or otherwise”.²¹ An AD was defined as any device or system that allows an individual to perform a task that they would otherwise be unable to do, or increases the ease and safety with which the task can be performed.

Literature search

Review articles, primary and grey literature were identified by a research librarian. Medline and EMBASE databases were searched using terms for “consumer products” and “falls OR injuries”. Reference lists of included articles were reviewed to identify additional literature. Grey literature was identified using the same terms in Google and consumer product safety sites in the US, Canada, the UK, and Australia. These results were supplemented by searches to identify literature for key types of consumer products: ladders, floor coverings, rugs, carpets, bathroom products.

Screening and data abstraction

Articles including information on at least one consumer product and injuries in older adults (≥45 years) were included. Abstracts were screened by a single reviewer (KW). Any questions regarding inclusion were resolved by a second reviewer (LG, PR). Study design, population, type of consumer products, injury characteristics, and whether the study included primary or secondary data were abstracted from each included article.

Canadian Community Health Survey (CCHS) - Healthy Aging

The CCHS-Healthy Aging includes community-dwelling people aged 45 years and over living in the ten Canadian provinces. Excluded from the sample were residents of the three territories; persons living on Indian reserves, Crown lands or in institutions; full-time members of the Canadian Forces; and residents of some remote regions. Data collection took place in participants’ homes from December 1, 2008 through November 30, 2009 using computer-assisted personal interviewing.

The content of the CCHS-Healthy Aging was developed collaboratively by Statistics Canada and researchers from the Canadian Longitudinal Study on Aging (CLSA).²² As part of the Statistics Canada-CLSA collaboration, CCHS participants were asked whether their survey data could be shared with the CLSA. This article includes data from CCHS participants who were between the ages of 45 and 85 years and who agreed to share their data with the CLSA, henceforth referred to as the CCHS-CLSA sample.

Measurement

Participants aged 65 years and older were asked whether they had sustained a fall in the previous 12 months in which they were hurt enough to limit some of their normal activities. Those reporting a fall were asked about the severity, nature, consequent health care resource utilization resulting from their fall, and whether they were using an AD at the time of their fall. If a participant had more than one fall, they were asked to describe their most “serious injury or problem due to a fall”. Fallers were asked whether they were concerned about future falls and if, as a result of this concern, they had stopped doing some activities.

Regression analyses were adjusted for a core set of socio-demographic factors (age, sex, marital status, education, and household income) and whether a participant reported having had more than one fall in the previous 12 months. These are known risk factors of falling and could be related to AD use.²³ Socio-demographic factors were categorized according to Statistics Canada documentation,²⁴ although some categories were collapsed due to low cell frequencies. Age was represented by five-year groups (65-69, 70-74, 75-79, and 80-85), marital status was represented as three categories (married/common-law, widowed/divorced/separated, and single/never married), education was categorized into post-secondary versus <post-secondary, and income was included as <\$30,000 CDN vs. ≥\$30,000 CDN.

Clinical frailty has also been shown to be associated with morbidity, institutionalization and mortality in people 65 years of age and older.²⁵ Because frailty would also be associated with AD use, we examined whether there was an independent effect of AD use after

Table 2. Weighted Prevalence of Falls Serious Enough to Limit Some Normal Activities in the Previous 12 Months in Relation to Socio-demographic Factors for Canadians Aged 65-85 Years

Variable	Weighted Prevalence	95% Confidence Interval	P-value for Difference
Overall	0.20	(0.19-0.21)	
Sex			
Male	0.18	(0.16-0.20)	<0.001
Female	0.22	(0.20-0.24)	
Age (years)			
65-69	0.18	(0.16-0.20)	<0.001
70-74	0.18	(0.16-0.20)	
75-79	0.22	(0.20-0.24)	
80-85	0.24	(0.21-0.27)	
Marital status			
Married/Common-law	0.18	(0.17-0.20)	<0.001
Widowed/separated/divorced	0.23	(0.22-0.25)	
Single	0.20	(0.15-0.25)	
Education			
Less than post-secondary	0.20	(0.18-0.22)	0.39
Post-secondary graduation	0.20	(0.18-0.22)	
Income			
<\$30,000	0.22	(0.20-0.24)	0.004
\$30,000-\$49,999	0.19	(0.18-0.21)	
Number of Chronic Conditions			
<5	0.17	(0.16-0.19)	<0.001
≥5	0.28	(0.26-0.31)	

CCHS = Canadian Community Health Survey; CLSA = Canadian Longitudinal Study on Aging; CI = confidence interval.

adjusting for frailty. Three frailty variables represented the domains of the clinical frailty scale developed by Rockwood et al.²⁵: level of physical activity, medical problems, and activity limitations. The Physical Activity Scale for the Elderly (PASE) was used to characterize physical activity.²⁶ The PASE scale incorporates leisure time, household, and work-related activities carried out in the previous week. Medical problems were characterized as the number of self-reported health professional-diagnosed chronic conditions. The CCHS collected information on 26 respiratory, musculoskeletal, cardiovascular, neurological, vision-related, and mental health conditions and cancer. A cut-point of 5 or more was used to represent a higher level of co-morbidities. Activity limitations were characterized using the instrumental and basic activities of daily living (ADL).²⁷ We categorized participants as having any versus no functional impairment.

Statistical analysis

The CCHS used a multistage stratified cluster design to select participants. To correct the potential bias resulting from this complex survey design, we used bootstrapping of all tests according to a set of replicate weights supplied by Statistics Canada for the CCHS-CLSA sample. Similarly, statistics dependent on standard errors are adjusted for survey design effects (i.e., the ratio of an estimated variance based on the survey to a comparable estimated variance from a random sample of the population).

Using a bootstrap method, sampling weights were used to estimate the prevalence and 95% confidence interval of having at least one fall serious enough to limit some normal activities in the previous 12 months for the Canadian population between the ages 65-85 years. Estimates were also provided for subgroups of the populations based on socio-demographic and health status factors. Weighted logistic regression was used to examine the relationship between AD use at the time of the fall and socio-demographic and frailty indicators, and the relationship between AD use at the time of the fall and the type of health services utilized and psychological consequences of the fall. Dependent variables included: whether medical attention was received, hospitalization, whether follow-up care was received, worry about future falls, and limiting activities

due to this worry. For each dependent variable, an unadjusted OR, an OR adjusted for socio-demographic factors, and an OR adjusted for demographic and frailty variables were estimated. All reported p-values are two-sided. Analyses were conducted using SAS version 9.2.²⁸

Regression analyses were limited to participants with complete data for all variables. Because the majority of missing data were for income, we conducted sensitivity analyses in which the median income was imputed for missing cases. Participants with missing income data were categorized in the ≥\$30,000 CDN group.

RESULTS

Environmental scan

The literature search yielded 40 citations, of which 21 directly addressed the association of consumer products with injuries in older adults (Table 1; Supplemental Table 1). The majority of the articles reported secondary database sources.²⁹⁻⁴⁵ Two included both primary and secondary data,^{46,47} and one collected primary data.⁴⁸ Of the three studies in which primary data were collected, one used an adaptation of the Nordic Medico-Statistical Committee (NOMESCO) classification⁴⁶ of products,⁴⁷ one used a list of product codes developed by the Council of Ministries of the European Union,⁴⁹ and one developed their own survey tool to collect information on consumer products.⁴⁸

Most of the reports (57.1%) presented national or international data. All studies included either hospital and/or emergency department admissions; eight studies^{29,31,32,35,41,42,45,49} (38.1%) also included mortality data, and one study included information on injuries that required time off work.⁴⁸ Of the 21 studies, 10 focused on ladders and/or steps and stairs,^{33-35,37,39-43,50} one focused on wheelchairs and adult walkers,³⁹ one included only sports products,³⁸ and one included only bathroom products.³⁰ The remaining articles^{29,31,32,36,45,47-49} described the mortality and morbidity associated with a broad spectrum of consumer products. The most commonly identified consumer products related to injuries were floors/flooring, stairs/steps, beds, chairs, rugs/carpets, ladders, footwear, outdoor structures, and housing/building materials. Only one

Table 3. Weighted Logistic Regression Results Examining the Association of Assistive Device Use at the Time of the Fall and Fall-related Health Care and Psychological Consequences in Canadians 65-85 Years of Age

Outcome	Unadjusted		Adjusted for Socio-demographic Factors*		Adjusted for Socio-demographic and Frailty Factors†	
	OR (95% CI)	P-value	OR (95% CI)	P-value	OR (95% CI)	P-value
Received medical attention	1.64 (0.88-3.02)	0.12	1.54 (0.82-2.87)	0.18	1.24 (0.65-2.38)	0.51
Hospitalized for injury	3.70 (1.54-8.90)	0.003	3.36 (1.26-8.92)	0.02	1.87 (0.72-4.86)	0.20
Follow-up care from a health professional	1.02 (0.47-2.21)	0.95	0.98 (0.45-2.12)	0.96	0.64 (0.28-1.45)	0.28
Worried about re-injury	2.81 (1.56-5.07)	<0.001	2.43 (1.31-4.49)	0.005	1.50 (0.73-3.07)	0.27
Limits activities due to worry about re-injury	3.79 (2.09-6.86)	<0.001	3.22 (1.69-6.12)	<0.001	1.91 (0.94-3.90)	0.07

* Analyses adjusted for age, sex, income, marital status, education, >1 fall in previous 12 months.

† Analyses adjusted for age, sex, income, marital status, education, >1 fall in previous 12 months, 5 or more chronic conditions, any ADL/IADL impairment, and physical activity level.

OR = odds ratio; CI = confidence interval.

study⁴⁸ reported the characteristics of the injury event and whether product fault was the cause of the accident.

CCHS-CLSA data

In total, 30,865 people aged 45 years and over participated in CCHS-Healthy Aging. The overall response rate was 74.4%; the response rate in participants 65-84 was 75.4%.⁵¹ Of these respondents, 26,248 (85.0%) met the additional CLSA eligibility criterion of being between 45-85 years old, and 20,087 (76.5%) agreed to share their data with the CLSA. Of these participants, 9,108 (45.3%) were 65-85 years of age and 9,106 (99.9%) completed the Falls module.

Complete data were available for 7,712 (84.7%) participants. Compared to those with incomplete data, participants with complete data were more likely male (45% vs. 33.7%), slightly younger (73.4±5.9 vs. 74.4±6.0), and reported no functional impairments (80.5% vs. 75.9%). The groups did not differ with respect to marital status, education level, or number of chronic conditions.

The data from these participants represent approximately 4.0 million Canadians aged between 65-85 years, of whom almost 800,000 (20%) experienced a fall in the previous 12 months. About two thirds of the falls were serious enough to limit normal activities. Over one third of participants reported more than one fall in the previous 12 months. The 12-month prevalence of falls differed by demographic characteristics (Table 2). A higher prevalence of falls was associated with being female, older, widowed, separated or divorced, earning less money, and having more chronic conditions.

About 6% of the fallers reported using an AD at the time of their fall. The odds of using an AD at the time of the fall were higher for participants who had ADL limitations (OR 4.16, 95% CI: 2.07-8.36), and for those with a lower level of physical activity (OR 0.87, 95% CI: 0.79-0.97 for a difference of 20 points PASE score).

The unadjusted ORs were statistically significant for hospitalization for injury (OR 3.70, 95% CI: 1.54-8.9), worried about re-injury (OR 2.81, 95% CI: 1.56-5.01), and limiting activities due to worry about re-injury (OR 3.79, 95% CI: 2.09-6.86) (Table 3). After adjusting for the socio-demographic factors, the magnitude of the ORs was slightly attenuated but still statistically significant. After adjusting for the frailty variables, AD use at the time of the fall was no longer statistically significant. The sensitivity analyses in which median income was imputed for participants not reporting income did not result in qualitatively different results (results not shown).

DISCUSSION

In our environmental scan, we found a dearth of information on the association between consumer products and injuries in older adults. The current literature lacks a clear link between consumer

products, the product's influence on a given injury, and the age of the subject when a given injury occurred. At present, most of the data available come from administrative databases, which have non-specific coding of consumer products and little information on the role of the consumer product in the injury. There are very little data for the 45-64 year age group.^{29,49}

Using the CCHS-CLSA sample, it was estimated that about 48,000 (6.1%) Canadians 65-85 years of age were using an AD at the time of their reported fall. In a prospective case series study, Zecevic et al.⁵² used the Seniors Falls Investigation Methodology to investigate falls in 15 community-dwelling seniors in London, Ontario. Although it was not a random sample, they reported that 3 of the 15 fallers (20%) were using an AD at the time of their fall. The Health and Activity Limitation Study (HALS) indicated that 35% of Canadians 75 years of age and older used an AD.⁵³ In the CCHS, AD-use data were not collected outside of the falls questions, thus we do not know how many people who regularly use an AD were not using it at the time of their fall.

We found AD use at the time of a fall was associated with hospitalization, worry about re-injury, and limiting one's activities due to this worry, even after adjustment for socio-demographic variables. When frailty variables were included in the model, however, AD use was no longer statistically significant. AD use in the fully adjusted model predicting limiting one's activities due to a fall has a p-value of 0.07. Although not statistically significant, it is important that we not completely ignore these results, as the fear of falling has been shown to have a negative impact on physical, psychological, and social functioning.⁵⁴ For example, restricting one's activities can in turn lead to social isolation. These findings underscore the need to pay more attention to the prevention of falls among those most vulnerable.

This is a relatively new area of research, thus we used a two-pronged approach of conducting an environmental scan to identify consumer product and injury literature and then analyzing the CCHS-CLSA data to help fill some of the information gaps. This study draws upon a large-scale national population-based cohort with a high participation rate. The large sample size allowed adjustment for a number of important confounders. We did, however, limit our sample to those participants with complete data. This group differed in sex, age, and functional limitations compared to those who did not have complete data. The most common reason for incomplete data was failure to report income, which we thought would be an important control variable as it could be associated with the quality of an AD. Our sensitivity analyses in which the median income was imputed for those not reporting their income did not result in qualitatively different results.

We are also limited by the specificity of the questions asked in the CCHS-Healthy Aging. There was a question asking whether an AD was being used at the time of the fall, but it was not clear if and how the AD contributed to the fall. As well, there was not a question regarding regular AD use such that one could determine if a person who normally used an AD was not using it at the time of their fall. Furthermore, as these data are restricted to people aged 65-85 years, it is likely that the relationship between consumer products and falls could be different in adults <65 years old.

The CCHS-CLSA data provide some preliminary information on the relationship between AD use and fall-related outcomes, however, the current data are not sufficient to draw specific conclusions. It is clear that a substantial number of people were using an AD at the time of their fall, but it is less clear if the ineffective use, misuse, or use of an AD contributed to the fall. It could be that ADs that contributed to injuries had design flaws, were less well maintained or did not provide sufficient instructions or training for their use. More detailed questions regarding the regular use of ADs and if and how the AD contributed to the injury would help to provide a richer understanding of this relationship. Attention should also be given to other consumer products and injuries, particularly to the contribution of design and maintenance to falls in seniors. Learning more about the relationship between consumer products and injuries can provide important information that might make using consumer products safer for Canadian seniors.

REFERENCES

1. Stevens JA, Mack KA, Paulozzi LJ, Ballesteros MF. Self-reported falls and fall-related injuries among persons aged ≥65 years—United States, 2006. *J Safety Res* 2008;39(3):345-49.
2. Scott V, Pearce M, Pengelly C. Technical report: Injury resulting from falls among Canadians age 65 and over on the analysis of data from the Canadian community health survey, cycle 2.1. In: Report on Seniors' Falls in Canada (2005). Ottawa, ON: Public Health Agency of Canada, 2005.
3. Blake AJ, Morgan K, Bendall MJ, Dallosso H, Ebrahim SB, Arie TH, et al. Falls by elderly people at home: Prevalence and associated factors. *Age Ageing* 1988;17(6):365-72.
4. Rubenstein LZ. Falls in older people: Epidemiology, risk factors and strategies for prevention. *Age Ageing* 2006;35(Suppl 2):ii37-ii41.
5. Scott VJ, Wagar L, Elliott SJ. Falls & related injuries among older Canadians: Fall-related hospitalizations & prevention initiatives. Public Health Agency of Canada, Division of Aging and Seniors. Victoria, BC: Victoria Scott Consulting, 2010.
6. Kannus P, Parkkari J, Koskinen S, Niemi S, Palvanen M, Jarvinen M, Vuori I. Fall-induced injuries and deaths among older adults. *JAMA* 1999;281(20):1895-99.
7. Speechley M. Unintentional falls in older adults: A methodological historical review. *Can J Aging* 2011;30(1):21-32.
8. Davis JC, Robertson MC, Ashe MC, Liu-Ambrose T, Khan KM, Marra CA. International comparison of cost of falls in older adults living in the community: A systematic review. *Osteoporos Int* 2010;21(8):1295-306.
9. Tinetti ME. Clinical practice. Preventing falls in elderly persons. *N Engl J Med* 2003;348(1):42-49.
10. Gillespie LD, Robertson MC, Gillespie WJ, Lamb SE, Gates S, Cumming RG, Rowe BH. Interventions for preventing falls in older people living in the community. *Cochrane Database Syst Rev* 2009;(2):CD007146.
11. Masud T, Morris RO. Epidemiology of falls. *Age Ageing* 2001;30(Suppl 4):3-7.
12. Currie LM. Fall and injury prevention. *Ann Rev Nurs Res* 2006;24:39-74.
13. Feldman F, Chaudhury H. Falls and the physical environment: A review and a new multifactorial falls-risk conceptual framework. *Can J Occup Ther* 2008;75(2):82-95.
14. Akyol AD. Falls in the elderly: What can be done? *Int Nurs Rev* 2007;54(2):191-96.
15. Binder S. Injuries among older adults: The challenge of optimizing safety and minimizing unintended consequences. *Inj Prev* 2002;8(Suppl IV):iv2-iv4.
16. Amador LF, Loera JA. Preventing postoperative falls in the older adult. *J Am Coll Surg* 2007;204(3):447-53.
17. Close JC. Prevention of falls in older people. *Disabil Rehabil* 2005;27(18-19):1061-71.
18. Aschkenasy MT, Rothenhaus TC. Trauma and falls in the elderly. *Emerg Med Clinics N Am* 2006;24(2):413-32.

19. Close JC, Lord SL, Menz HB, Sherrington C. What is the role of falls? *Best Pract Res Clin Rheumatol* 2005;19(6):913-35.
20. World Health Organization. Falls 2010. Available at: http://www.who.int/violence_injury_prevention/other_injury/falls/en/index.html (Accessed August 21, 2011).
21. U.S. 110th Congress. Consumer product safety improvement act. 2008. Report No. 15. U.S.C. 2052.
22. Statistics Canada. Canadian Community Health Survey - Healthy aging (CCHS). 2009. Available at: <http://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=5146&lang=en&db=imdb&adm=8&dis=2> (Accessed August 21, 2011).
23. Peel NM. Epidemiology of falls in older age. *Can J Aging* 2011;30(1):7-19.
24. Statistics Canada. Canadian Community Health Survey (CCHS): Healthy aging, derived variable documentation. 2011.
25. Rockwood K, Song X, MacKnight C, Bergman H, Hogan DB, McDowell I, Mitnitski A. A global clinical measure of fitness and frailty in elderly people. *CMAJ* 2005;173(5):489-95.
26. Washburn RA, Smith KW, Jette AM, Janney CA. The Physical Activity Scale for the Elderly (PASE): Development and evaluation. *J Clin Epidemiol* 1993;46(2):153-62.
27. Fillenbaum GG, Smyer MA. The development, validity, and reliability of the OARS multidimensional functional assessment questionnaire. *J Gerontol* 1981;36(4):428-34.
28. SAS Institute Inc. SAS/STAT 9.2 User's guide. Cary, NC: SAS Institute Inc., 2008.
29. Watson WL, Day L, Ozanne-Smith J, Lough J. Consumer product-related injuries in older persons. Victoria, Australia: Monash University Accident Research Centre, 1999. Report No.: 162;1-171.
30. Rutherford GW, Schroeder TJ. Sports-related injuries to persons 65 years of age and older. Washington, DC: US Consumer Product Safety Commission, 1998;1-14.
31. Rutherford GW, Marcy N, Mills A. Emergency room injuries adults 65 and older. 2005;1-10. Available at: <http://www.cpsc.gov/LIBRARY/FOIA/FOIA05/os/older.pdf> (Accessed January 15, 2012).
32. Injuries in the European Union: Statistics summary 2003-2005. Vienna, Austria: Kuratorium für Verkehrssicherheit, 2007.
33. Bradley C. Ladder-related fall injuries. Flinders University, Adelaide, South Australia: Australian Institute of Health and Welfare, 2007. Report No.: 11.
34. Canadian Institute for Health Information. Falls among seniors - Atlantic Canada. 2010;1-19.
35. Cripps RA, Carman J. Falls by the elderly in Australia: Trends and data for 1998. Adelaide: Australian Institute of Health and Welfare, 2001. Report No.: 6.
36. Mo F, Choi BC, Clotey C, LeBrun B, Robbins G. Characteristics and risk factors for accident injury in Canada from 1986 to 1996: An analysis of the Canadian Accident Injury Reporting and Evaluation (CAIRE) database. *Inj Contr Saf Promot* 2002;9(2):73-81.
37. Farmer P. Falls from ladders. Toronto, ON: OIPRC, SMARTRISK, 2009. Report No.: 6.
38. Wheelchair or adult walker falls. Toronto: OIPRC, SMARTRISK, 2006. Report No.: 4.
39. Ontario Injury Compass. Vol. 3, 2006.
40. D'Souza AL, Smith GA, Trifiletti LB. Ladder-related injuries treated in emergency departments in the United States, 1990-2005. *Am J Prev Med* 2007;32(5):413-18.
41. Diggs BS, Lenfesty B, Arthur M, Hedges JR, Newgard CD, Mullins RJ. The incidence and burden of ladder, structure, and scaffolding falls. *Acad Emerg Med* 2005;12(3):267-70.
42. Cassell E, Clapperton A. Consumer product-related Injury (3): Injury related to the use of ladders. Victoria, Australia: Monash University Accident Research Centre, 2006. Report No.: 63.
43. Bedi HS, Goldbloom D. A review of nonoccupational ladder-related injuries in Victoria: As easy as falling off a ladder. *J Trauma* 2008;64(6):1608-12.
44. Shepherd M, Barker R, Scott D, Hockey R, Spinks D. Bathroom injuries in Queensland. Australia: Queensland Injury Surveillance Unit, 2006. Report No.: 91.
45. Massachusetts Department of Public Health. Unintentional fall-related injuries among Massachusetts older adults. Boston, MA: Commonwealth of Massachusetts, Department of Public Health, 2008.
46. Nordic Working Group. NOMESCO Classification of External Causes of Injury, 4th ed. Copenhagen: Nordic-Medico Statistical Committee, 2007.
47. Eilert-Peterson E, Laflamme L. Product-related injuries at home. *Int J Inj Contr Saf Promot* 1998;5(4):203-14.
48. Access Economics Pty Limited. Baseline study of consumer product-related accidents. Ministerial Council on Consumer Affairs, 2007.
49. Department of Health and Children. EHLASS Report for Ireland 2002. Dublin, Ireland: Hawkins House, 2003.
50. O'Sullivan J, Wakai A, O'Sullivan R, Luke C, Cusack S. Ladder fall injuries: Patterns and cost of morbidity. *Injury* 2004;35(4):429-31.
51. Statistics Canada. Canadian Community Health Survey (CCHS) - Healthy Aging User Guide. Ottawa: Statistics Canada. Health Statistics Division, 2011.
52. Zecevic AA, Salmoni AW, Lewko JH, Vandervoort AA, Speechley M. Utilization of the Seniors Falls Investigation Methodology to identify system-wide causes of falls in community-dwelling seniors. *Gerontol* 2009;49(5):685-96.

53. Forbes WF, Hayward LM, Agwani N. Factors associated with self-reported use and non-use of assistive devices among impaired elderly residing in the community. *Can J Public Health* 1993;84(1):53-57.
54. Scheffer AC, Schuurmans MJ, van Dijk N, van der Hooft T, de Rooij SE. Fear of falling: Measurement strategy, prevalence, risk factors and consequences among older persons. *Age Ageing* 2008;37(1):19-24.

Received: March 7, 2012

Accepted: July 18, 2012

RÉSUMÉ

Objectif : Procéder à une analyse de l'environnement pour définir la portée de la documentation sur les produits de consommation et les blessures chez les personnes âgées et pour combler certaines données manquantes en explorant la relation entre les accessoires fonctionnels (AF) et les blessures liées aux chutes.

Méthode : L'analyse de l'environnement a inclus la documentation de base, répertoriée dans les bases de données Medline et EMBASE, et la littérature grise trouvée dans Google et sur les sites de sécurité des produits de consommation des États-Unis, du Canada, du Royaume-Uni et de l'Australie.

Nous avons ensuite procédé à une analyse de régression logistique pondérée pour examiner la relation entre les facteurs sociodémographiques, les indicateurs de fragilité et l'utilisation d'AF au moment de la chute, d'une part, et le type de services de santé utilisés et les conséquences psychologiques de la chute, d'autre part, selon les données sur le vieillissement en santé dans l'Enquête sur la santé dans les collectivités canadiennes 2008-2009.

Résultats : La majorité des articles publiés sur les produits de consommation et les blessures citent des sources de données secondaires et ne font pas de lien direct entre les produits de consommation et tel ou tel type de blessure. Nous avons constaté que l'utilisation d'un AF au moment de la chute était associée à l'hospitalisation, à la crainte de se blesser à nouveau et à la restriction des activités en raison de cette crainte, même compte tenu des variables sociodémographiques. Quand nous avons inclus les variables de fragilité dans le modèle cependant, l'utilisation d'un AF n'était plus un facteur significatif.

Conclusion : Notre étude donne des informations préliminaires sur la relation entre l'utilisation d'AF et les résultats sanitaires après une chute. Les données actuelles sont toutefois insuffisantes pour tirer des conclusions précises. Des questions plus détaillées sur l'utilisation des AF, à l'échelle de la population, et des questions supplémentaires sur le rôle des AF dans les blessures nous aideront à mieux comprendre la nature de cette relation.

Mots clés : blessures; sécurité des produits de consommation; chutes accidentelles; personnes âgées; vieillissement