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RESEARCH ARTICLE

HOME INJURY AMONG ELDERLY POPULATION IN MALAYSIA

***,[1]Norhafizah Sahril, [1]Tahir Aris and [2]Roslinah Ali**

[1]Institute for Public Health, Ministry of Health Malaysia, Malaysia
[2]Institute for Health Systems Research, Ministry of Health Malaysia, Malaysia

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ABSTRACT

Background: In Malaysia, injury is one of the leading causes of death and disability. The aims of this study are to determine the prevalence of home injury and its associated factors among elderly population in Malaysia.
Methods: This study is a cross sectional population-based survey design using two-stage stratified random sampling of households. Data was collected using a validated questionnaire by face to face interview and analysed using SPSS version 19.0.
Results: The overall prevalence of home injuries among elderly population aged 60 and above was 5.3% (95% CI: 4.3-6.5), out of an estimated population of 107,035. The prevalence was higher among females, rural dwellers, those 80 years old and above, 'others' ethnicity and elderly from medium family income. Kitchen was the most common place of injury (20.4% [95% CI: 12.4-31.5]). The most common cause of injury was falls (42.2% [95% CI: 32.0-53.2]) and self-neglect was the main contributing factor (47.0% [95% CI: 36.6-57.6]). Multivariate logistic regression analysis revealed that women (aOR=1.801, p<0.001), elderly aged 70-79 years old (aOR: 2.049, p<0.001) and elderly aged 80 years and above (aOR: 2.485, p<0.001) were more likely to sustain a home injury.
Conclusion: Home injuries among elderly are indeed a growing public health problem which deserves more attention than being currently given. There is a need for educational and intervention programmes to increase the awareness and understanding of elderly safety and injury prevention in Malaysia.

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INTRODUCTION

Home is a place where many people spend most of their time, but it is found as one of the common location for injuries (Sikron *et al*., 2004). Injuries, are major causes of mortality (Runyan *et al*., 2005) and morbidity (Runyan *et al*., 2005), which constitutes a significant public health problem worldwide and, also contribute to cost of burden (Scuffham *et al*., 2003; Thanh *et al*., 2003). The panorama of injury occurring in the home has been well described in countries with high-income (Runyan *et al*., 2005; Runyan *et al*., 2005; Runyan and Casteel, 2004; Alptekin *et al*., 2008). Every year, many unintentional home injuries (Runyan and Casteel, 2004) and deaths (Alptekin *et al*., 2008) related to these injuries are reported in the developed countries. Injuries in the home can occur among people of all ages, but the highest incidence was reported among children and elderly people (Schelp and Svanström, 1986; Kopjar and Wickizer, 1996). About 22% of residents in Norway need yearly medical care for home injuries and the rates were increased when elderly people are involved (Kopjar and Wickizer, 1996). In Malaysia, the National Health and Morbidity Survey (NHMS) in 1996 found that the prevalence of home injury in Malaysia was 2.5% and it was higher among the elderly (Haniff *et al*., 2000). Lim KH *et al*. reported that 5.8% out of 4842 respondents aged 60 years and above had experienced some kind of home injury based on data from NHMS 2006 (Haniff *et al*., 2000). Owning to the higher prevalence of home injury among elderly in NHMS 2006, the Ministry of Health Malaysia (MOH) has taken an initiative to focus on the study of home injury among Malaysian elderly in the fourth NHMS in 2011. In 2020, the population aged 60 years and above in Malaysia is projected to reach 7.3% (Wan-Ibrahim and Zainab, 2014) and the population of Malaysia is moving towards an aging population (Heisil, 1984). As the number and percentage of older population in Malaysia continues to increase, the need for extensive and current information on this older population increases and thus, issues

Corresponding author: Norhafizah Sahril,
Institute for Public Health, Ministry of Health Malaysia, Malaysia.

regarding older persons are becoming increasingly important to be discussed. Therefore this study was purposely conducted to determine the prevalence of home injury and its associated factors among elderly population in Malaysia.

MATERIALS AND METHODS

The Fourth National Health and Morbidity Survey 2011

The NHMS 2011 was a national health survey. It was a cross-sectional study using a stratified two stage sampling technique. Field data collection was conducted for four months from March 2011 to July 2011. A bilingual (Malay and English) questionnaire was designed, pre-tested and piloted prior to the commencements of the survey. Face-to-face interviews were conducted by trained research assistants. Details of the methodology can be found in the NHMS report (Institute for Public Health, 2011).

Sampling

All elderly aged 60 years and above who have experienced home injury in the last one year were selected for the purpose of this study.

Instrument

Home injury was one of the modules in NHMS 2011. Home injury was defined as any injury that occurred at home which prevents respondent from doing normal daily activities or engaging in outdoor activities for one day or more; or an injury which requires treatment by a doctor or other medical staff. There were six questions related to home injury that covers on experience of home injury, location, causes of injury, contributing factors and hospital admission due to injury and the presence or absence of anyone when the injury occurred at home. For experience of home injury, respondents were asked if they had experienced any injury at home such as fall, burn, poisoning, submersion in water, or by a firearm, sharp object or an act of violence from another person for the last one year with a possible one categorical answer (1)=Yes, (2)= No, (3)= Do not know and (4)= Refuse to answer. For location of injury, respondent were asked the location of injury occurrence with regards to the most serious injury happened in the last one year with a possible one categorical answer (1)= Gate/Door, (2)= Drain, (3)= Drive Way, (4)= Garage, (5)= Front Yard, (6)= Backyard, (7)=Living Room, (8)= Bedroom, (9)= Kitchen, (10)= Toilet/ Bathroom, (11)= Stairs and (12)= Others. For contributing factors due to injury, respondents were asked why did the injury happen with a possible one categorical answer (1)= Self-neglect/lack of attention, (2)= Negligence/intentional by other person, (3)= No supervision by adult, (4)= Too tired, (5)= Health problem (loss of hearing/vision/balance), (6)=Other human factors, (7)=Uneven floor or holes, (8)= Slippery floor, (9)= Unsafe staircase , (10)= Poor lighting, (11)=Poor housekeeping and (12)= Other surrounding environment factors. Respondents were also asked about the most common causes of the injury with one possible categorical answer (1)= Struck against object, (2)=Struck by falling/sliding/moving object, (3)= Crushed by moving/sliding objects, (4)= Cut, (5)= Caught in/between object, (6)= Slipped/fall at same level, (7)= Fall from height/from different level, (8)= Injured by lifting/carrying/handling, (9)= Injured by using equipment, (10)= Contact with extreme temperature, (11)= Exposure to/contact with/inhaled harmful substance, (12)= Exposure to/or contact with electrical current, (13)= Exposure to explosion,(14)= Suffocation, (15)= Submerged in water, (16)=Animal bite/insect sting,(17)= Physical assault, (18)=Others. For hospital admission respondent were asked whether they were admitted to the hospital because of any injury with a possible one categorical answer (1)= Yes, (2)= No, (3)= Do not know and (4)= Refuse to answer. The last question was on the presence of anyone when the injury occurred at home with a possible categorical answer (1)= Yes, (2)= No, (3)= Do not know and (4)= Refuse to answer.

Data analysis

Data analyses were conducted using SPSS version 19.0 utilising complex survey design. Descriptive analyses were used to estimate the prevalence of overall home injury among elderly 60 years old and above in Malaysia and prevalence by socio-demography profiles. Descriptive analyses also were done to estimate the causes, place, contributing factors and outcome of home injuries. A multiple logistic regression analysis was applied to analyse the odds of home injury by socio-demography predictors for sex, residency, age group, ethnicity and family income. Final model was created that include all predictors and interactions which were significantly associated at a level of p-value <0.05.

RESULTS

There were 2706 eligible respondents aged 60 years old and above in this study. More than half of them (65.1%) resided in urban areas. The majority of them were females; 51.5%. By ethnicity, the majority were Malays; 48.8%, followed by Chinese; 37.2%, others ethnic; 9.3%, and Indians; 5.7%. In terms of age groups, the majority of the elderly were aged 60-69 years old (61.1%). The majority of elderly were from medium family income (MYR 1000-4999); 49.2%, followed by a low family income (less than MYR 1000); 37.3%, and a high family income (more than MYR 5000); 13.5%. Overall, 139 (5.3%) of the elderly reported experiencing at least one injury in the last one year. The prevalence of home injuries were reported higher among women; 6.7% (95% CI: 5.2-8.7), rural dwellers; 5.4% (95% CI: 4.1-7.1), elderly aged 80 years and above; 9.1 (95% CI: 5.8-14.1), others ethnic; 6.2% (95% CI: 3.1-11.9) and elderly from medium family income; 6.3% (95% CI: 4.8-8.1). Multiple logistic regression analysis revealed that women (aOR=1.801, p<0.001), elderly aged 70-79 years old (aOR: 2.049, p<0.001) and elderly aged 80 years and above (aOR: 2.485, p<0.001) were significantly associated to sustain home injury after adjusting all other predictors (Table 1) The three most common causes of injury were slipped or fall at the same level 42.2% (95% CI: 32.0-53.2), followed by fall from height or from different level 13.5% (95% CI: 7.6-22.7) and struck against object 14.6% (95% CI: 8.50-24.0). Self-neglect or lack of attention; 47.0 (95% CI: 36.6-57.6), health problems regarding loss of hearing, vision or balance; 18.6% (95% CI: 11.6- 28.5) and slippery floor; 15.6% (95% CI: 8.90-26.0) are the three most contributing factors to injury.

Table 1. Risk Factors of home injury among elderly sixty years and above

Variable	No. (%) of respondents			Crude OR	*p*-value	Adjusted OR	*p*-value
	Total	Injury	No Injury				
Sex							
Male	1258 (48.5)	46 (3.8)	1212 (96.2)	1		1	
Female	1448 (51.5)	93 (6.7)	1355 (93.3)	1.846	0.008	1.801	0.012
Residence							
Urban	1358 (65.1)	66 (5.3)	1292 (94.7)	1		1	
Rural	1348 (34.9)	73 (5.4)	1275 (94.6)	1.026	0.902	0.889.	0.658
Age Group							
60-69 years old	1625 (61.1)	57 (3.8)	1568 (96.2)	1		1	
70-79 years old	834 (29.7)	56 (7.1)	778 (92.9)	1.925	0.008	2.049	0.004
80 years and above	247 (9.3)	26 (9.1)	221 (90.9)	2.524	0.002	2.485	0.002
Ethnicity							
Malays	1477 (48.8)	74 (5.8)	1403 (94.2)	1.323	0.274	1.453	0.206
Chinese	785 (37.2)	39 (4.5)	746 (95.5)	1		1	
Indian	199 (5.7)	14 (5.0)	185 (95.0)	1.127	0.755	1.099	0.298
Others	245 (8.3)	12 (6.6)	233 (93.8)	1.417	0.405	1.639	0.809
Household Income (MYR)							
Low (< MYR1000)	1042 (37.3)	43 (4.0)	999 (96.0)	1		1	
Medium (MYR 1000-4999)	1340 (49.2)	76 (6.3)	1264 (93.7)	1.625	0.057	1.857	0.014
High (> MYR5000)	324 (13.5)	20 (5.4)	304 (94.6)	1.383	0.347	1.617	0.194

The most common injury locations were reported in the kitchen 20.4% (95% CI: 12.4-31.5), living room 19.1% (95% CI: 11.5-30.0), front yard 14.3% (95% CI: 8.5-23.0), bathroom 14% (95% CI: 7.6-24.4) and bed room 11.5% (95% CI: 5.9-21.2). Among those who had injuries, 16.8% (95% CI: 10.7-25.3) were reported to be admitted to hospital. The prevalence of injury among elderly was reported to be higher [69.4% (95% CI: 58.8-78.3)] when there was a presence of person accompanying them.

DISCUSSION

Accidents in the home are a major public health issue in most countries, as they are frequent causes of injury and death. Moreover, other consequences, such as disability, suffering and diminished productivity, have a considerable impact on society. Home injuries can occur in everyday activities and affect people of all ages especially elderly people. The prevalence of home injury among elderly in this study is lower compared to the previous NHMS study (Institute for Public Health, 2006). Although the prevalence is decreasing, it is important to take action since there has been too little attention paid to this issue in Malaysia. Unlike other environments, such as the road, the workplace, etc., the home should be safe, serene and have protection for those who live in it. It is well known that home injuries mostly involve people who spend a lot of time in home; women, children and elderly. Women were found more likely to sustain home injury than men and this finding was similar with many other studies (Lim *et al*., 2013; Evci *et al*., 2006). This could be due to the fact that women spend more time at home than men do because they have more responsibilities at home. The factors of more concerned with the care of children and their houses, do much domestic work such as cooking and cleaning the houses; and also because of the higher life expectancy among women have made them most at risk of home injuries (Majori *et al*., 2009). Elderly people in particular are highly vulnerable to home injuries. Indeed, our studies revealed that elderly aged 70 years old and above were found more prone to get injured. This result was supported by other studies that the rate of home injuries were with age (Lim *et al*., 2013; Evci *et al*., 2006). Older adults probably experience home injury frequently because they also spend more time in the home environment, compared with other age groups who spend a significant duration of time at work (Runyan *et al*., 2005). In addition, loss of cognitive abilities due to increased age might lead to a tendency towards accidents as well. We recorded that fall was the most common cause of home injury, followed by struck against object. Falls are very common in older people (Prevention and Panel, 2001; Northridge *et al*., 1995; Sattin *et al*., 1990; Sorock, 1987). Each year, millions of old adults aged 65 years and older fall (Tromp *et al*., 2001). Approximately 45% of all injuries in the household environment that resulted in medical attention are caused by falls (Runyan *et al*., 2005). In United States, one in every three persons aged 65 years and above falls every year (Sattin and Sattin, 1992). There were about 8.0% of Malaysian elderly aged 60 years and above involved in home injuries and falls were found to be the most common cause (Hasni *et al*., 2003). In elderly people, falling is probably related to postural instability, functional status, impaired eyesight and pathological factors such as cardiovascular and neurological diseases and arthrosis. In any case, falls can have serious physical and psychological consequences in the elderly and may accelerate the individual's physical and mental decline, leading to a precocious reduction in self-sufficiency. Self-neglect or lack of attention, health problems regarding loss of hearing, vision or balance and slippery floor were found as the three most contributing factors to injury among elderly. Self-neglect occurs when an older person, by choice or due to a lack of awareness or ability, lives in ways that disregards his or her own health or safety. Respondents who were having hearing and vision problems and were not using eyeglasses were

reported to have more accidents than others (Donmez and Gokkoca, 2003; Bergland *et al*., 2003; Lee *et al*., 1999). In addition, the loss of muscle strength and flexibility, and impaired balance and reaction time may also lead to injuries in the elderly (Myers *et al*., 1996; Wells and Evans, 1996). Slippery floors can contribute to loss of balance in the elderly and it was an important risk factor for falls in the house. In Thailand, those whose houses had slippery first floors were found 1.39 times more likely to fall than those whose houses did not. Those who had slippery bathroom floors were also found 1.32 times (OR: 1.32; 95% CI: 1.16-1.49) more likely to fall than those who did not (Sophonratanapokin *et al*., 2012).
Most injuries happened in the kitchen, followed by the living room, front yard, bathroom and bedroom. These findings are consistent with those in the literatures (Sophonratanapokin *et al*., 2012; Majori *et al*., 2009; Lee *et al*., 1999; Alptekin *et al*., 2008; Panatto *et al*., 2009). Kitchen become the more common location of injuries maybe due to the fact that women were found more likely to be involved in the kitchen activities doing cooking and cleaning (Majori *et al*., 2009; Majori *et al*., 1999; Sathiyasekaran *et al*., 1996). Living room and bathroom were also found as common locations of injuries because people use both of it as the major personal areas. Bathroom can be connected to injury cases because it is the place where individual uses his independency at most and consequently stays alone due to the feeling of privacy. Clearly, efforts to reduce injuries in the home should aim to implement preventive intervention among elderly people, since the elderly population is destined to grow as a result of increasing life expectancy. In particular, preventive action should focus on reducing the incidence of home injuries by eliminating risk-related structural features, strengthening individuals' knowledge and by raising public awareness of the problem through health education campaigns.

Limitation

This study did not include any hospital or emergency department survey data. In future, surveillance and prospective studies should be proposed in order to get the true population incidence of injuries and risk factors among the elderly.

Conclusion

The findings in this study are very helpful in understanding unintentional injuries among elderly populations at home. Females and elderly aged 70 years and above had higher risks of home injury because of spending long periods of time in the home. Special attention must be paid to protect these groups of people. As falls are the major cause of home injury, falls prevention strategies should focus on improving the housing conditions and making the home a safe environment for the elderly. It might also be beneficial to implement educational programs for such risky age groups, which have been proven to be effective in reducing accident frequency (36).

Declaration of Conflicting Interests

The author(s) declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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