ORIGINAL ARTICLE

Community Profile Towards Risk for Unintentional Home Injuries Among Elderly in Low-Income Urban Area

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ABSTRACT

Introduction: Home injury among the elderly was among the recognized public health issues that could become more prevalent in any nation that would approach an ageing society. However, the community's perception and preparedness toward the nature of this condition still needed to be improved. This study aimed to determine the community's profile on unintentional home injury risks among the elderly. **Methods:** A cross-sectional study was conducted among the community of low-income urban areas in Selangor, using non-probability sampling and a validated self-administered questionnaire covering three domains of risk for unintentional home injuries. **Results:** 246 respondents participated in this study, with a mean age of 40. The proportion of reported unintentional home injuries among the elderly was 7.3%. Fall was the most common type of injury (72.7%). Of the three domains for risks of unintentional home injuries, only two domains for risks of unintentional home injuries, were significantly associated with the community's gender (with home safety domain: difficulties in moving things [p=0.027] and difficulties with a staircase [p=0.034]); self-manage domain: concerned when missing medications [p=0.029]), educational level (with self-manage domain: self-care ability [p=0.012] and ability to take balanced diet [p=0.008]), and occupational status (with self-manage domain: concerned when losing weight [p=0.028]) which were home safety and ability to self-manage. **Conclusion:** The gender and educational level of the community members might reflect different community profiles regarding the risk of unintentional home injuries among the elderly. Thus, to overcome the dangers of elderly unintentional home injuries in the future, policymakers should advocate targeted health education programs for both the elderly population and the community at large.
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INTRODUCTION

Injuries constitute one of the significant public health problems worldwide, with almost 8% of all deaths. Of the 4.4 million injury-related deaths annually, 72% of the life lost was unintentional injuries. These injuries are preventable, and identifying the risk factors, such as the setting of the injuries, has become the basis for prevention. Even though injuries are a significant cause of death and a disease burden in all countries, they are not evenly distributed across or within countries. It means that some people are more vulnerable than others based on their risk factors, such as low socioeconomic status and unsafe living quarters (1).

Moreover, United States statistics showed that accidents were the type of unintentional injury listed as one of the leading causes of death in those aged 65 and above (2). Populations at risk for injuries can be identified by several risk factors, including age group, whereby elderlies were the most at risk; socioeconomic status, with poorer individuals more at risk compared with wealthier counterparts; and geographic location, with urban and rural populations at higher risk, compared with their suburban counterparts (3). United Nations has defined the elderly as 65 years and above (4). However, for Malaysia, based on the national health policy for the elderly, this population was defined as those who are 60 years old and above and, in terms of its population, is encroaching on an ageing society, where the population above 65 years old is increasing from 5.8% in 2015 to 6.0% in 2016 (5). It was also projected to become an ageing nation by 2035 (4). These figures emphasize the need for the health care system to address the health

problems among the elderly, including home injury. The findings from the National Health Morbidity Survey (NHMS) in 2011 revealed that the prevalence of home injury among the elderly (65 years and above) in Malaysia was 5.3%. The prevalence was higher following the age group of about 3.8% for the '60s, 7.1% for the '70s, and the 80's it was increased by 2% (6). Based on these findings, the implication was that, even though the prevalence was low, home injury still needs to be addressed because the victim suffered prevailing health outcomes that could lead to permanent disability and even death. Moreover, injury among the elderly is usually associated with high morbidity and mortality and is thus a public health concern.

According to a study by Zhang et al., there were many risk factors, which included gender, the presence or absence of floor tiles, a residence near a road, use of a cane or walking stick, sleep duration, food intake, mental health, diabetes, arthritis, and cataracts that was found to be significantly associated with unintentional injuries among the elderlies (7). Falls were the second leading cause of unintentional injury deaths worldwide, with people over 60 suffering the most significant number of fatal falls (8). Thus, many studies focused on this type of injury. Among those were the significant risk factors that were associated with falls, including in terms of the number of medications used, functional independence of activity of daily living (ADL) (9), being unemployed (10), and having a history of fractures (11). With regards to the location of the unintentional injuries, one of the reasons for the high number of home injuries among the elderly was the hazard perception in which they failed to recognize the existence and severity of potential hazards. Therefore, they exercise modest caution when the situation is risky (12).

Furthermore, elderly people with a history of minor in-home accidents considered bathing, crossing the street, and climbing stairs riskier than those without an accident history (13). Among elderlies, concern with household safety was related to accident history in the preceding year such that subjects with an accidental injury in the prior year indicated more significant safety concerns (14). Nevertheless, there was limited knowledge of community or caregiver perception of the elderly risk for unintentional injuries. Previous literature explored the perception of caregivers' burden if they were required to care for an elderly relative that revealed conflicting feelings and potential negative expectations among them (15); however, there was no similar study on community perception of the risk factors found. The present study will provide insight into the perception and future role of the community in this type of injury prevention.

In Malaysia, there was still a lack of studies that addressed unintentional injury among the elderly, especially from the caregiver's or the community's perspectives. Instead, most of the previous studies had focused on children and adolescent age groups (16-18). The country was projected to become an ageing nation by 2035 (4), which means that in the future, our population could have an elderly dependent in their household. Studies have shown that caring for elderly dependents could negatively affect potential caregivers (15). Therefore, knowledge of the community's profile on the aspect of elderly care could provide insight into the future elderly care education to ensure healthy ageing among the population. Thus, the main objective of this study was to determine the community's profile and its associated factors on unintentional home injury risks among the elderly in one of the urban low-income communities in Malaysia.

MATERIALS AND METHODS

A cross-sectional study was conducted in one of the urban municipal areas in Selangor, Malaysia. The study population consisted of a low-income community of eligible respondents recruited after they fulfilled the inclusion and exclusion criteria. The status as a low-income community was based on the address of the respondents living in the housing designated as low-cost housing under the jurisdiction of the selected municipal authority of the study location. All residents at the study location who were 18 years old and above were included. The target community for this study include all age group, from young adult to the elderly, and include those who live with elderly dependents and those who do not. However, those with hearing or speech impairment and those who could not understand the Malay or English language were excluded. One member of each household who consented to participate was invited to complete the study questionnaire. The sample size was calculated using OpenEpi online software with the expected frequency of unintentional home injury taken as 18% based on Mannocci et al. (19), with a precision of 0.05 and power of 80% with a known population of study of 16116. The calculated minimum sample size was estimated to be 246, with an attrition rate of 10%. Simple random sampling using a random number generator was performed on the sampling frame provided by the municipal authority of the selected study location, which was approached before data collection to obtain access to the study population. However, due to the low response rate from respondents in the randomized list, the sampling was changed to non-probability sampling whereby questionnaires were distributed door-to-door instead, targeting one focus low-income housing area until a minimum number of samples was obtained.

A bilingual (Malay and English) self-administered questionnaire was distributed to the participating households containing three parts. Part I: Sociodemographic profile; Part II: The community's profile towards unintentional home injury risks among the elderly consisted of three domains: Home Safety (8-item) based on a study by Evci et al. (20), Family Support

System (5-item), and Ability to Self-Manage (10-item); and; Part III: Occurrence of unintentional home injury among elderly (12-item) including the frequency, type, location, contributing factors and outcome of the injury; based on the study by Ching (21). The back-to-back translation was performed from the original English to the Malay language. Pre-testing was conducted before the actual study. Internal consistency was acceptable, with a Cronbach alpha value of 0.786. Data analysis was conducted using Statistical Package for the Social Science (SPSS) version 26.0 (22). For descriptive analysis, results were presented as frequency and percentages. A Chi-square test was used to determine the association between categorical variables. The level of statistical significance was set as a p-value of less than 0.05.

ETHICAL APPROVAL
Ethical approval was obtained from Universiti Teknologi MARA Research Ethics Committee (REC/367/16).

RESULT

A total of 246 respondents participated in this study. The overall mean age of the respondents was 40 years old (SD=14). About 12.1% of the respondents were elderly, with a mean age of 66 (SD=6), and 20.6% of non-elderly respondents stayed with an elderly relative in their house. The mean age of elderly dependents was 68 years old (SD=8). Most respondents were males (52%), married (69.5%), and living with a mean number of household members of four persons. Table I summarizes the characteristics of the respondents. Among the elderly respondents, many were female (63.5%), 3.6% had a physical disability, and 10.7% needed to use assistive devices for mobility, such as a wheelchair or walking stick. Most of them were also using spectacles (73.2%), with small percentages having hearing problems (12.5%) and chronic illnesses (75%).

Table I. Respondents' characteristics

Variables		Frequency	Percentage (%)
Race			
	Malay	208	84.6
	Indian	21	8.5
	Chinese	5	2.0
	Others	12	4.9
Gender			
	Male	128	52.0
	Female	118	48.0
Marital status			
	Married	171	69.5
	Single	63	25.6
	Widowed	9	3.7
	Divorced	3	1.2
Education Level			
	No formal education	7	2.8
	Primary school	18	7.3
	Secondary school	142	57.7
	Higher education	79	32.1

CONTINUE

Table I. Respondents' characteristics (cont.)

Variables	Frequency	Percentage (%)
Occupation		
Employed	126	51.2
Housewife	44	17.9
Self-employed	34	13.8
Pensioner	22	8.9
Un-employed	17	6.9
Student	3	1.2

The community's profile on the three domains of home safety, family support system, and ability to self-manage was summarized in Table II. As shown in Table III, with regards to the occurrence of unintentional home injury, 7.3% of respondents claimed that there was an occurrence of unintentional home injury among the elderly in their households. The most common types of injuries were falls (72.7%) and cuts (27.8%), with the incident occurring in the presence of the company (54.5%) from 12:00 noon to 6:59 p.m. Meanwhile, the most common places for the injuries were mostly in the toilet (54.5%), followed by the kitchen (36.3%), and lastly in the bedroom (9.1%). Most elderlies seek treatment after injury (72.7%) at government clinics (33.3%). Only 37.5% of them who sought treatment have been hospitalized. Most of them did not have any disability due to injury except one person who had a temporary disability and another person who developed a permanent disability. Gender was found to be significantly associated with the safety of home domain, specifically in terms of difficulties in moving things (χ^2 =10.96, p=0.027), difficulties with a staircase (χ^2 =10.40, p=0.034), and ability to self-manage which was being concerned when missing medications (χ^2 =16.21, p=0.029). Meanwhile, the educational status was found to be significantly associated with ability to self-manage domain, which was the self-care ability (χ^2 =24.13, p=0.012) and ability to take a balanced diet (χ^2 =16.21, p=0.008). Other than that, it was found that occupational status was significantly associated with self-manage domain, which was in being concerned when losing weight (χ^2 =33.76, p=0.028).

Table II. Community's Profile on Home Injuries Risks among Elderly

PERCEPTION DOMAIN	STRONGLY DISAGREE Freq. (%)	DISAGREE Freq. (%)	NOT SURE Freq. (%)	AGREE Freq. (%)	STRONGLY AGREE Freq. (%)
HOME SAFETY					
Difficulties moving from room to room	17 (6.9)	56 (22.8)	29 (11.8)	110 (44.7)	34 (13.8)
Difficulties using the toilet seat	25 (10.2)	67 (27.2)	31 (12.6)	99 (40.2)	24 (9.8)
Difficulties getting in and out of the bathroom	16 (6.5)	63 (25.6)	25 (10.2)	116 (47.2)	26 (10.6)
Difficulties to get far-reach things	23 (9.3)	82 (33.3)	23 (9.3)	96 (39.0)	22 (8.9)
Difficulties with staircase	57 (23.2)	112 (45.5)	18 (7.3)	49 (19.9)	10 (4.1)

CONTINUE

Table II. Community's Profile on Home Injuries Risks among Elderly (cont.)

PERCEPTION DOMAIN	STRONG-LY DIS-AGREE Freq. (%)	DIS-AGREE Freq. (%)	NOT SURE Freq. (%)	AGREE Freq. (%)	STRONG-LY AGREE Freq. (%)
HOME SAFETY					
Difficulties cause by bad lighting	57 (23.2)	147 (59.8)	15 (6.1)	2.5 (10.2)	2(0.8)
Difficulties due to absence of assistive material	9 (3.7)	47 (19.1)	15 (6.1)	121 (49.2)	54 (22.0)
Difficulties in getting help for standing up after fall or injury	51 (20.7)	120 (48.8)	30 (12.2)	36 (14.6)	9 (3.7)
FAMILY SUPPORT SYSTEM					
Adequate care by family	3 (1.2)	7 (2.8)	14 (5.7)	129 (52.4)	93 (37.8)
Daily necessities when left for work	1 (0.4)	11 (4.5)	7 (2.8)	136 (55.3)	91 (37.0)
Spending time with elderly	2 (0.8)	5 (2.0)	10 (4.1)	139 (56.5)	90 (36.6)
Health reminders	0 (0)	7 (2.8)	7 (2.8)	145 (58.9)	87 (35.4)
Trust to bring to health care facilities	2 (0.8)	4 (1.6)	5 (2.0)	133 (54.1)	102 (41.5)
ABILITY TO SELF-MANAGE					
Self-care	7 (2.8)	72 (29.3)	38(15.4)	95 (38.6)	34(13.8)
Self-tidiness	1 (4.0)	52 (21.1)	37 (15.0)	120 (48.8)	36(14.6)
Taking a balanced meal	9 (3.7)	55 (22.4)	27 (11.0)	118 (48.0)	37 (15.0)
House cleanliness	3 (1.2)	40 (16.3)	33 (13.4)	123 (50)	47 (19.1)
Seek for medical attention	10 (4.1)	65 (26.4)	23 (9.3)	98 (39.8)	50 (20.3)
Being concern if miss medication	12 (4.9)	62 (25.2)	57 (23.2)	89 (36.2)	26(10.6)
Being concern if lose weight	18 (7.3)	81 (32.9)	58 (23.6)	72 (29.3)	17 (6.9)
Financial problems	27 (11.0)	91 (37.0)	31 (12.6)	74 (30.1)	23 (9.3)
Adequate basic amenities	1 (4.0)	13 (5.3)	18 (7.3)	145 (58.9)	69 (28.0)
Encounter stressful event	20 (8.1)	65 (26.4)	35 (14.2)	95 (38.6)	31 (12.6)

Table III. Characteristics of Unintentional Injuries among the Elderly Respondents

Variable	Frequency	Percentage (%)
Type of injury (n = 18)		
Tripped/fall	13	72.7
Cut/stabbed	5	27.8
Contributing factors for the injury (n=18)		
Health problem	5	13.5
Slippery floor	5	13.5
Careless	4	10.8
Too tired	4	10.8
		CONTINUE

Table III. Characteristics of Unintentional Injuries among the Elderly Respondents (cont.)

Variable	Frequency	Percentage (%)
Loss of balance	4	10.8
Self-neglect/ lack of attention	3	8.1
Negligence	2	5.4
No supervision by adults	2	5.4
Loss of vision	2	5.4
Uneven floor or holes	2	5.4
Poor lighting	2	5.4
Poor house keeping	1	2.7
Presence of company during incident (n=11)		
Yes	6	54.5
No	5	45.5
Timing of incidence (n=11)		
6.00 a.m. to 11.59 a.m.	3	27.3
12.00 noon to 6.59 p.m	4	36.4
7.00 p.m. to 12.00 midnight	3	27.3
12.01 a.m. to 5.59 a.m.	1	9.1
Location of the injury (n=11)		
Toilet	6	54.5
Kitchen	4	36.3
Bedroom	1	9.1

DISCUSSION

The majority that participated in this community study were male respondents, in contrast to findings reported under NHMS 2018, with most of their respondents being female (23). The reason could be due to the reason that, in the present study, the head of the household, who was commonly the male in the family, had decided to take part in this study during data collection. In terms of perception of home safety, many respondents agreed that the elderly have difficulties in all related living conditions, including moving from room to room and getting in or out of the bathroom. These could imply that the respondents might perceive their house was not conducive to the elderly. About 40% of the respondents agreed that the elderly will have difficulty using the toilet seat in their place. These difficulties were made worse by the lack of assistive devices, which most respondents needed. However, many respondents disagreed that the elderly had difficulties with the staircase. The reason for this could be due to the housing type of the respondents, which was comprised of flats equipped with a lift; thus, they rarely required a staircase. For the family support system domain, more than half of the respondents agreed on all aspects of the family support system for the elderly, including adequate care, daily necessities, companion time, health status concerns, and readiness to bring to healthcare facilities. For the

domain of the ability to self-manage the elderly, most of the respondents agreed that the elderly could take care of themselves, eat a balanced diet, clean house on their own, seek health medical attention, and have adequate basic amenities. However, the majority disagreed that the elderly will be concerned when they miss their medications or have financial problems. In terms of the ability to self-manage domain, it was found that most respondents agreed on all the family support items for the elderly. Indirectly, this might reflect that most of the respondents perceive the elderly as family-dependent people rather than being independent and self-sufficient. This finding was evidenced in a study among provisional caregivers, highlighting that elderly care required a combination of many tasks such as personal care, household management, errands outside the home, and helping with medical care (24).

The national survey found that fall was the most common mechanism for unintentional home injury, with the prevalence of falls (once in 1 year) being about 72% (23). Being 'cut' was the second most common mechanism of home injury in this study population, like findings in another study in China but with lower prevalence among their people (7). The timing of the injuries, which occurred more frequently in the evenings between 12:00 p.m. and 6:59 p.m., also supported the findings from another local study (25). The timing could be due to environmental factors such as dim light and could contribute to poor visual acuity in the elderly. The present study revealed that the five primary contributing factors are health problems, slippery floors, carelessness, exhaustion, and loss of balance. Most falls in the toilet, and the kitchen were due to slippery floors, while the one in the bedroom was due to tripping out of poor balance. The reason for this fall could be due to many reasons outside this study's scope.

Gender was found to have a significant association with the home safety domain, which could be due to the possibility that women might spend more time and have more responsibility in a household compared to men; therefore, this will make them more aware of the safety of the house condition which will be related to the elderly. Furthermore, the finding was expected because it concurred with results in a previous study that women were obliged to be the caregivers in the family in the eyes of society, leading to them being the ones with more knowledge on the safety of their homes, including when it is related to the elderly dependent (26). Admittedly, there was a lack of studies that highlighted the gender association as a risk of unintentional home injuries among the elderly; instead, the studies on unintentional home injuries had focused on children and mothers, making it difficult to compare with the findings in terms of gender influence (27-28). Another study in Indonesia also highlighted that in terms of safety, women perceived it more negatively compared to men (29). In addition, a study in Spain highlighted the importance of gender differences as among the factors in domestic accidents, which supported the gender significance of our study (30).

The finding that educational status was significantly associated with the self-manage domain profile compared to past literature revealed mixed results. It was observed to be in contrast with the previous systematic review on factors associated with unintentional home injuries that showed educational level as not among the related factors (31). It was also in contrast with another study done in Japan. However, the study was conducted to assess the children population rather than the elderly, which concluded unintentional injuries were independent of socioeconomic factors (32). However, a more recent study of childhood unintentional home injuries in Qatar had shown that the educational status of the parents was significantly associated with knowledge of accidental home injuries, which could be indirectly supported by our study finding that the educational level is a significant factor for the community profile towards elderly's unintentional home injury (33). These contrasting findings might be because, in this study population setting, the community's cultures strongly advocated for the children to take care of their elderly parents, and education in this culture influenced the respondent's views with different levels of educational status. In the past, the role of culture was indeed found to influence the perception of a caregiver in a study that spanned 20 countries (34).

Occupational status was also significantly associated with the self-manage domain, which echoed the previous study on unintentional home injuries (31). Other than that, a prior modelling study had highlighted that the unemployment status had a negative impact on elderly care by the family members (35). Narrowing down on the self-manage domain itself, one of the essential aspects that were thought to be neglected by the elderly in caring for their selves was taking care of their body weight. In other words, the elderly might appear not to care about this. Still, physical changes could be more noticeable to others than themselves, giving the impression that the elderly were not concerned with their weight changes, such as weight loss, compared to those around them. Weight loss, in turn, could be interpreted as a sign of the elderly not feeling well. It might indicate the need for further treatment and subsequently become an important aspect to be monitored by the working members of the household. On the positive side, findings from the present study could also be translated into the possibility that respondents in this study were observant of their elderly physical conditions to ensure their well-being was taken care of instead of being perceived as being pessimistic about the elderly capability to take care of themselves.

Based on all the findings from the present study, the injury prevention effort should be integrated

into existing programs for the elderly population. Community awareness programs on identifying risk factors for unintentional home injuries among the elderly should be advocated, especially to promote home safety for the elderly. The importance of home safety designs, such as concepts or models of safe home and safety education, could be emphasized. The relevant government authorities should also consider creating a policy on safe home design and features for home injury prevention that should be implemented in both urban and rural to create an elderly-friendly home. For example, to prevent fall injuries, slip-floor resistance should be installed, especially in the bathroom and kitchen, and for staircases, the steps should be consistent in height and size. Furthermore, the health authorities could also provide or adapt potential stratification tools, such as the Short Physical Performance Battery (SPPB) test, which will predict the risk of falls among the elderly (36) or the automated stratification for fall risk for older patients after discharge from an emergency department (37), to be disseminated during community health education programs. Risk stratification for fall injuries was also among the highly recommended measures for fall prevention among the elderly (38). Other than that, because injuries that could occur were minor and could be self-treated, the community should be encouraged to learn first-aid skills so that treatments are administered promptly, timely, and appropriately. Finally, most respondents perceived that the elderly were not independent in their ability to care for themselves, which was demonstrated by agreeing to offer a strong family support system. In the long run, or for a very low-income community, this could lead to the feeling of being burdened to care for the elderly in the household. It might be because it was found that the willingness to provide informal care to the elderly was indicated by available housing space, flexible working hours and the proximity of relatives (39). Thus, there is a need for the government to ensure support services for the elderly who need some assistance with the activity of daily living at home, either in terms of home care services or elderly care centers that are available and accessible. Findings from this study provided insight into the community profile or view towards risk factors for unintentional home injuries among the elderly.

Nonetheless, these study findings should be cautiously interpreted because they might not represent urban low-income communities in other areas in Malaysia. This study also shares the limitation of a cross-sectional study design whereby causality cannot be implied. Future studies on potential interventions to address the potential risk for unintentional home injuries among the elderly in the community will provide vital insight for targeted community health education programs.

CONCLUSION

The community's perception of unintentional home injury risks was significantly associated with gender, educational status, and occupational status. The potential dangers regarding home conditions and elderly independence were among the factors that warranted further attention. Targeting and educating the right people, implementing best practices for promoting self-management, and designing a safe home design for the elderly might prevent this type of injury in the future.

ACKNOWLEDGEMENTS

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