

Health promotion approach to reduce unintentional home injuries of young children in rural villages in the North Central Province of Sri Lanka

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Abstract

Background: South East Asian region reports a higher risk for deaths from injuries and in Sri Lanka 16% child mortality is due to injuries.

Objectives: To describe the types and extent of unintentional home injuries among children below 5 years of age, to evaluate the knowledge, attitudes and current practices of primary caregivers on reducing unintentional home injuries in two villages and to assess the effectiveness of a health promotion approach in rural villages in the North Central Province of Sri Lanka.

Method: A quasi experimental study was carried by selecting 2 rural villages. Baseline measures were gathered in experimental and control areas using a questionnaire, a history record index and a practice checklist. A health promotion intervention was administered in the experimental study area. The intervention was developed consulting the community and targeted identifying determinants of unintentional home injuries and improving knowledge, changing attitudes, obtaining family support and improving skills on identifying risks for home injuries. The health promotion intervention was delivered through lectures and activities. Post evaluation assessment was on change in practices which was the primary outcome, and the change in knowledge and attitudes were secondary outcomes.

Results: Injury prevalence was 31% (CI 20.5- 43.1), burns (36.4%) being the most common. The difference between pre and post scores of mean practice was significantly higher ($p=0.001$) in the intervention group which showed knowledge improvement and a positive change in attitudes.

Conclusions: Nearly one third of caregivers reported a home injury and the health promotion

intervention was effective in improving injury prevention practices, knowledge and attitudes.

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(Key words: Unintentional home injuries, children under 5 years, health promotion, intervention)

Background

In developing countries injuries are a major cause of death among 1-5 year old children¹. A South East Asian community survey showed that 30% deaths of 1-3 year old children and 40% deaths of 4 year old children were related to injuries². Most injuries among children below 5 years are reported to occur at home as they often live around and outside home³. The common causes of injuries are accidental burns caused by kerosene lamps, scalding by water and intentional acts among children between 1-4 years of age⁴. Prevention of childhood injuries and accidents remains a key issue and a priority health area in Sri Lanka⁵.

Many studies reveal that parents and caregivers can prevent childhood injuries by addressing their own behaviour and risky environmental factors around them^{6,7}. The main factors identified as contributing to unintentional injuries are children's physical characteristics, socioeconomic factors in the family and parental and caregiver factors^{8,9}. The parental factors are the attitudes and beliefs on possible accidents to their children, previous incidents, severity of injuries and ability to identify or predict a risk. Awareness and knowledge on consequences of child injuries and means of injury prevention also determine the degree of adopting the above practices⁷.

Parents and caregivers in many developed countries are educated and are conscious in making child-proof houses, taking preventive measures for a safe home and play environment for children¹⁰ and installing readymade safety devices for child proofing homes¹¹. Sri Lankan communities do not focus much on making child proof houses and usage of safety devices. However, if the community is empowered, it is possible to develop and practise such behaviours by the community in a sustainable way. Health promotional models have been used to empower parents and caregivers to prevent home injuries among children.

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Objectives

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Method

Design and sample

The baseline study was conducted in Wannammaduwa and Nambadagaswewa villages in the North Central province. One village was selected as the interventional group and the other village as the control group for the assessment of the health

promotional approach. Selections were done randomly. The post-evaluation was carried out 3 months after completion of the intervention in both areas. All eligible families i.e. families having a child between 0-5 years of age, under the care of the public health midwife (PHM) in the village, were selected. This included 36 families from the experimental area and 35 from the control area. The participant was the primary caregiver defined as “a parent or caregiver both male and female, of children below 5 years of age spending most of the time caring for the children”. Parents and caregivers of disabled children, who stay away from home and do not often visit their children and parents with psychiatric illness were excluded from the study due to their sensitive and specific lifestyle pattern. Figure 1 is a flow diagram of the study.

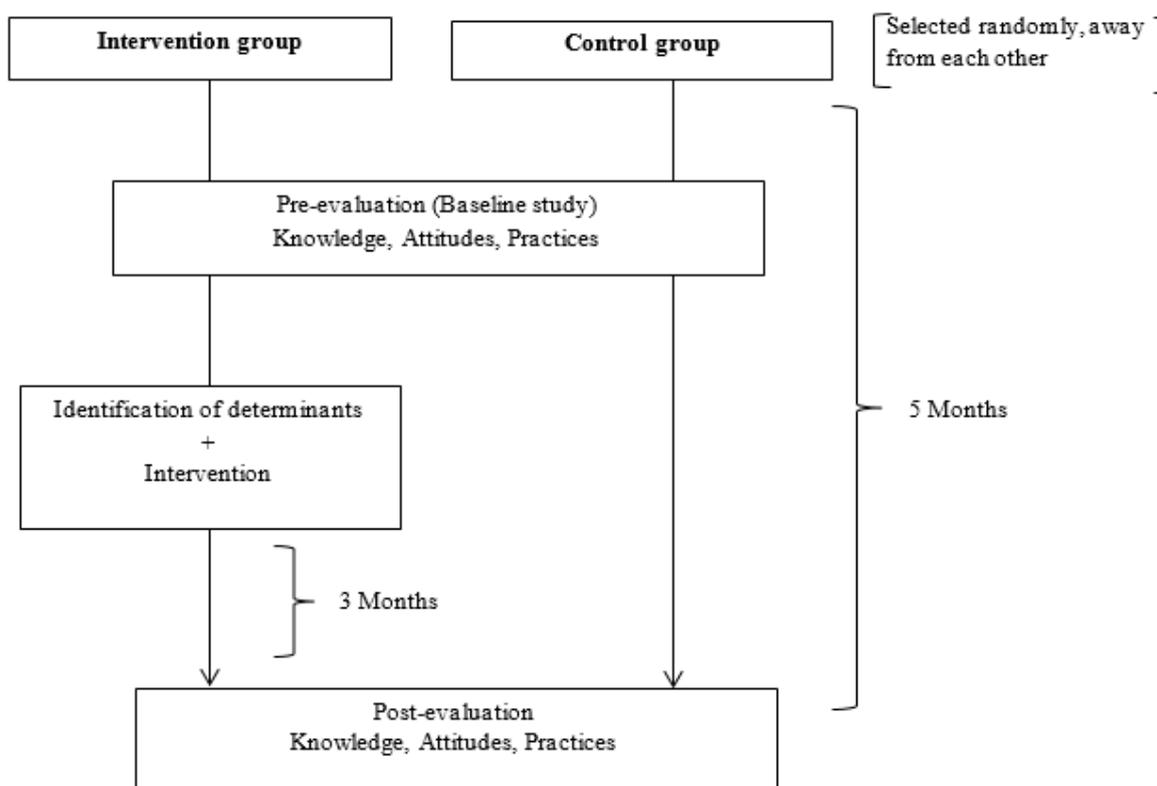


Figure 1: Flow Diagram of the study

Measures

An interviewer administered questionnaire was used to assess the sociodemographic characteristics, knowledge of parents and caregivers on definition of accident, types of accidents, forms and extent of harm caused, risk factors, necessity for prevention, attitudes towards home safety and feasibility of preventing unintentional home injuries. A history record index assessed the previous history (types and extent) of injuries, age at injury, type and mode of injury, harm caused and safety measures taken to prevent further injuries. To assess the household

practices, a checklist with 30 safety practices was used. Practices were monitored in five places in the house: kitchen, bath place, bedroom, living room and compound. Each practice was separately observed and measured according to a Likert-type of scale e.g. very attentive, attentive to some extent, very little attentive / not attentive at all. If any safety measure was taken to remove a risk or an accident at the above places, that was considered as a highest scored practice. If there were no measures taken to remove the risk but they have thought of and seen the risk, those practices were given the middle mark

and if they hadn't seen or thought about the risk, those practices were given the lowest mark. Thereafter, a practice score was calculated from a list of practices observed through home visits. The primary outcome measure was the change of the mean practice score between baseline and 3 months after the intervention. Secondary outcomes were percentage changes of knowledge and attitudes between baseline and follow-up.

Data collection procedure

The principal investigator (PI) carried out the data collection in village monthly weighing clinic or the participants' homes in both experimental and control study areas. All houses had a home visit where the PI spent at least 15 minutes for the observation of practices during which time the checklist was completed. Informed written consent was obtained from all participants. Permission to carry out the study and the intervention was obtained from the local and regional health officials and from the Department of Biological Sciences of the Rajarata University of Sri Lanka.

Health promotion intervention

Development of the intervention was based on a health belief model which explains that preventive behaviours are a function of people's beliefs about their susceptibility to the health problem, the severity of the health problem, the benefits versus costs of adopting the preventive behaviour¹², and the fact that health promotion is capable of driving the participants to take control over the determinants that govern their lives.

Development of the intervention: The health promotional intervention was developed with the participation of the caregivers in the intervention group. Four groups were formed where 18 volunteer participants gathered once in two weeks with the PI. Determinants for poor safety practices of parents and caregivers to reduce injury occurrence were discussed and identified. Initially participants' understanding on determinants was enhanced. PI facilitated to bring out unrecognized factors by the participants and they agreed on them after analysing them within the group. The outcomes were written in papers by one of the participants in a group throughout the discussions. All four groups developed lists of determinants for each group identified. Thereafter, the PI prepared a summarised document and used it to plan intervention with

participants, which included factors such as lack of ability to guess or identify risks in home and behaviour, poor family support for creating a safe environment, lack of enthusiasm and poor cohesion of family, not having common feeling/ cohesion among villagers, attitudes and beliefs like "my child will not face any risks or accidents", "child will not experiment risky acts" and "as a caregiver I will always be cautious and will not make any mistakes" and poor awareness/ knowledge on childhood injuries.

Delivery of the health promotion intervention:

Interactive discussions were conducted using visual aids. The questionnaire used at the survey was taken as a guide to discuss about the unknown facts on childhood unintentional injuries. Participants' attitudes were also addressed during these discussions. Participants' ability to identify risk factors at home were strengthened by picture puzzles during group discussions where pictures of model houses with risk factors were shown and participants were given the opportunity to identify risks. Home visits were made to each house in the intervention group to observe and the removal of risk factors from home also contributed to identifying risk factors. Changes which needed time were emphasised and advice was given to remove the dangers in due course. During the follow up sessions, interactive discussions were held with the use of visual aids to identify the possible risk factors at home and participants were asked to explain possible injuries that can occur and suggest precautions to remove the risks.

Statistical analysis

Statistical Package for Social Sciences (SPSS) version 16.0 was used for data entry and analysis. Random checks were performed on 10% of the data to ensure accuracy. Each practice was given a score ranging from 0-3 and a total score was calculated for each participant. Effectiveness of the intervention was assessed by comparing practices of the pre and post data in both study areas separately using the paired t-test. Differences of the knowledge and attitudes were compared in the two study communities by comparing their proportions.

Results

Table 1 shows the sociodemographic characteristics of the intervention and control groups.

Table 1: Sociodemographic characteristics of the participants

	Intervention group (n=36)	Control group (n=35)
Characteristics of mother		
<i>Age (years)</i>		
19-25	25.0%	11.4%
26-35	61.1%	65.7%
36-47	13.9%	22.9%
<i>Educational level</i>		
Up to grade 8	19.4%	05.7%
Up to Ordinary Level (O/L)	50.0%	48.6%
Up to Advanced Level (A/L)	27.8%	40.0%
Higher education	02.8%	05.7%
<i>Employed</i>		
Yes	19.5%	34.3%
No	80.5%	65.7%
Characteristics of father		
<i>Age (years)</i>		
19-25	02.8%	05.7%
26-35	58.3%	42.9%
36-47	38.9%	51.4%
<i>Educational level</i>		
Up to grade 8	30.6%	0
Up to O/L	50.0%	57.1
Up to A/L	16.7%	37.1
Higher education	0%	5.7
<i>Employed</i>		
Yes	100%	100%
No	0%	0%
Other characteristics of the family		
<i>Caregivers</i>		
Only parents	55.6%	48.6%
Grand mother	36.1%	31.4%
Other	08.4%	19.4%
<i>Income level</i>		
10,000-35,000 rupees	86.1%	62.8%
Above 35,000 rupees	13.9%	37.2%

Education less than Ordinary Level (O/L) in mothers and fathers in intervention group was 69.4% and 81% while in control group it was 54.3% and 57.1% respectively. Levels of education up to Advanced Level (A/L) were higher among mothers and fathers in the control group than in intervention group. Majority of mothers in both groups were unemployed. Majority of "other caregivers" were grandmothers in both groups. The types and extent of unintentional home injuries are shown in Table 2.

Home injuries: Prevalence of unintentional home injury was 31% (CI 20.5-43.1) in both study areas. Out of all types of injury, burns was the highest (36.4%) followed by cuts and falls (18.2%). Chemical ingestions were few (13.6%). Majority has required hospital admission and the injury had occurred in the kitchen or garden. Nearly 80% of injuries had occurred when someone had been near or around the child.

Table 2: Types and extent of unintentional home injuries

Description of injury (n=22) only among those who reported injury	
Variable	No. (%)
<i>Type of injury</i>	
Burn	08 (36.4)
Cut	04 (18.2)
Animal bite	03 (13.6)
Fall	04 (18.2)
Chemical/invasive things penetrating body	03 (13.6)
<i>Severity</i>	
Severe-hospitalized	10 (45.5)
Mild severity-not hospitalized	06 (27.3)
Not severe	06 (27.3)
<i>Place of occurrence</i>	
Kitchen	07 (31.8)
Garden	07 (31.8)
Bedroom	04 (18.2)
Living room	03 (13.6)
<i>Situation</i>	
When someone near or around child	18 (81.8)
When child alone	04 (18.2)

Practices: The practice score difference after the intervention was significantly different in the intervention and the control group ($p < 0.001$), with a higher mean difference in the intervention group. Table 3 compares the mean score and changes in score of practices

Table 3: Comparison of mean score and changes in score of practices

Study group	Pre mean (SD)	Post mean (SD)	p-value	Difference between post and pre means	Standard error of mean	p-value	Paired t value
Intervention group (n=36)	36.25 (5.7)	43.72 (6.3)	0.001	7.47	0.68	0.001	6.85
Control group (n=35)	39.94 (4.98)	41.69 (5.12)	0.001	1.74	0.48		

Table 4: Comparison of knowledge and attitude changes between intervention and control group

	Variable	Intervention (n=36)		Control (n=35)	
		Pre No. (%)	Post No. (%)	Pre No. (%)	Post No. (%)
Definition of an injury	Correct understanding of an injury	11 (30.6)	28 (77.8)	12 (33.3)	15 (42.9)
Why children should be protected from injuries (multiple answers)	Safety is a right of the child	07 (19.4)	26 (72.2)	09 (25.0)	11 (31.4)
	Providing safety is parents/ caregivers responsibility	30 (83.3)	34 (94.4)	27 (75.0)	29 (82.9)
	Future development depends on a safe childhood	17 (47.2)	35 (97.2)	27 (75.0)	30 (85.7)
	children can't themselves prevent accidents	07 (19.4)	34 (94.4)	19 (52.8)	22 (62.9)
	Mental, physical, social harm can occur	10 (27.8)	34 (94.4)	14 (38.9)	17 (48.6)
Types of injury	Burn	31 (86.1)	35 (97.2)	32 (88.9)	34 (97.1)
	Suffocation	07 (19.4)	30 (83.3)	08 (22.2)	10 (28.6)
	Fall	35 (97.2)	36 (100)	34 (97.1)	35 (100)
	Chemical ingestion/poisoning	09 (25.0)	34 (94.4)	19 (52.8)	20 (57.1)
	Animal bite	22 (61.1)	35 (97.2)	28 (80.0)	29 (82.9)
	Electrocution	16 (44.4)	35 (97.2)	25 (69.4)	30 (85.7)
	Cuts	28 (77.8)	35 (97.2)	29 (80.6)	33 (94.3)
	Drowning	05 (13.9)	32 (88.9)	09 (25.0)	13 (37.1)
Extent of harm	Death	27 (75.0)	35 (97.2)	25 (71.4)	31 (88.6)
	Physical damage	32 (88.9)	36 (100)	32 (91.4)	35 (100)
	Disability	22 (61.1)	34 (94.4)	29 (82.9)	30 (85.7)
	Psychosocial developmental delay	09 (25.0)	31 (86.1)	13 (37.1)	17 (48.6)
	Disturbances to education	16 (44.4)	35 (97.2)	19 (52.8)	22 (62.9)
	Mental disorders	17 (47.2)	35 (97.2)	22 (62.9)	24 (68.6)
Reasons for injury occurrence	Active movements of the child due to age development	26 (72.2)	34 (94.4)	28 (80.0)	29 (82.9)
	Child's body characteristics have risky features	03 (08.3)	26 (72.2)	02 (05.7)	02 (05.7)
	Child can't predict or prevent accidents	22 (61.1)	35 (97.2)	27 (75.0)	28 (80.0)
	Risky situations in the child's living environment	18 (50.0)	35 (97.2)	26 (74.3)	28 (80.0)
	Risky behaviours of parents & caregivers of the child	10 (27.8)	26 (72.2)	15 (41.7)	17 (48.6)
	Poor supervision of parents & caregivers of the child	14 (38.9)	35 (97.2)	22 (62.9)	25 (71.4)
	Because parents & caregivers don't predict or prevent accidents	12 (33.3)	30 (83.3)	10 (28.6)	10 (28.6)
Even at home child has a risk in meeting with severe accidents	No I don't	05 (13.9)	02 (05.6)	05 (14.3)	03 (08.6)
	Yes may be	31 (86.1)	34 (94.4)	30 (85.7)	32 (91.4)
How much your house provide safety to your child	Very much	25 (69.4)	32 (88.9)	29 (82.9)	31 (88.6)
	Some	11 (30.6)	04 (11.1)	06 (17.1)	04 (11.4)
How much your behavior provide safety to your child	Very much	30 (83.3)	36 (100)	32 (91.4)	33 (94.3)
	Some	06 (16.7)	0	03 (08.6)	02 (05.7)
How far you can prevent harmful unintentional accidents to your child at home	Very much	29 (80.6)	34 (94.4)	28 (80.0)	30 (85.7)
	Some	07 (19.4)	02 (05.6)	07 (20.0)	05 (14.3)

Knowledge and attitudes: Table 4 shows the different aspects of knowledge increments and attitude changes at pre and post intervention in both study groups. Comparison of percentage differences in intervention and control groups shows that intervention has a higher percentage change than the control group. Attitudes towards the possibility of child meeting with severe accidents at home to which the answer “yes may be” changed in intervention group from 86.1% to 94.4% while in control group it was from 83.4% to 88.7%.

Discussion

Though there is prevalence data of road traffic accidents and related injuries¹³, home based injuries are not properly documented in health care centres¹⁴. This study was a baseline study and development of intervention and the assessment of the health promotion intervention. This may be an important source of information for future research and policy making. The injury prevalence in these areas was 31%. This value is close to 28.19 per 100 children observed in the cross sectional study done among children under 5 years in a selected community in Sri Lanka by Welgama IP *et al.* in 2014¹⁴. The checklist assessed the risks of places in home surrounding such as kitchen, bathroom, living room and garden, and the raw findings revealed that more risks were located around kitchen and garden. This was evidently shown from the injury prevalence data by highlighting kitchen (31.8%) and garden (31.8%) as places where most injuries occurred. However, Welgama IP *et al.* (2014)¹⁴ reported that 16.8% of injuries occurred in the garden and Thein MM *et al.* (2005)¹⁵ reported that in Singapore, 51% of injuries occurred in the kitchen.

Burns were a common type of injury in the present study. A study in a selected community in Sri Lanka showed falls (74%) as the commonest cause among 0-5 year children followed by falling objects, animal attacks and burns¹⁴. At global level drowning and fire related burns are common injuries among 1-4 year children followed by falls and poisoning¹³. Most home injuries (82%) had occurred when someone was near or around the injured child. This evidently shows that the main determinant factors for injuries are: inability to predict accidents, poor supervision, and carelessness of parents or caregivers. However, results from the study of Morrongiello BA *et al.* (2004) revealed that approximately 67% of injuries occur when mothers were not in the same room with their child⁷. Suffocation (21%) and drowning (19%) were the least identified types of injury by participants in this study. It is known that suffocation is a common injury among infants¹⁶. These aspects of knowledge are important for parents as awareness of the potential dangers makes one more cautious and

promotes caregivers to create a safe surrounding for children.

Studies highlight the fact that mere delivery of an intervention is not effective if there is no perceived need to the community^{16,19}. Community should gain control over determinants of their life to make changes, this being the main principle of health promotion. Bringing out solutions from the community itself or by their choice, rather than by compulsion, thus creating long lasting success²⁰ was the hallmark of the intervention in this study. Further, if the community takes control over determinants in their life, there may be more positive changes, which are in the long term, sustainable²¹.

The history record index was a successful tool in assessing unintentional injury in children since it descriptively collected case records of the injury. However, consideration should be given to the fact that there might be a possibility for recall bias and over- or underreporting of the number of injury types and frequency. Practices assessment through home visit observations and discussion with residents ensured quality of data. Another limitation is that the study was carried out in only two small villages limiting the number of eligible participants. Expansion of the study area would have overcome this problem. The strength of this study was determining the underlying factors through interactive group discussion within groups. Mutual understanding and mutual relationships acted as a foundation for success.

Conclusions

Nearly one third of caregivers reported a home injury and the health promotion intervention was effective in improving injury prevention practices, knowledge and attitudes.

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