

## Social Determinants of Health and Home Safety for Under-five Children in a Neighbor's Tehran, Iran

### Abstract

**Background:** Social determinants of health (SDH) provide a platform in improving health society such as safety. Safety is essential for children because it is directly related to the health and development. The objective of this study was to evaluate the current home safety in the capital city of Iran for children below five years by community-based initiative and its association with common SDH variables. **Methods:** This is a cross-sectional study, considering community- and family-based initiative. According this five domains checklist which was including physical, kitchen, bath, toys, and first-aid kit, 200 family home safety were evaluated. Moreover, the relation between children safety and social determinants of health was assessed. Furthermore, the research team designed an attractive record card for each child that was distributed among families by community volunteers. **Results:** The result was extracted into two age groups: less and more than 6 months. We designed an attractive card for each child and distributed among families by volunteers. It showed that children of age above 6 months had higher home safety score. We found a positive association between mother's education and total safety score. **Conclusions:** This study was a part of MAZDAK project which means friendly environment for children in Persian word. It showed that an effective way for promoting children safety in the community would be community engagement and family cooperation. As the family education can help reduce children injuries, MAZDAK as a model can be run in the other places to check the effects of SDH on home safety for children. This was an experience of improving community knowledge and behavior about home safety by the parents themselves to improve their children safety environment, and it is going to continue the efficacy of Intervention.

**Keywords:** Children, community-based initiation, safety, social determinants of health

### Introduction

Social determinants of health (SDH) as a platform improve health and safety that is strongly affected family, community, and national levels.<sup>[1,2]</sup> Safety, which is a fundamental human right, is directly and intimately associated with health. In fact, the main factors influencing the safety are environment and behavior that affect the health and welfare of humanity.<sup>[3]</sup> Safety is a complex concept that can encompass a variety of fields; most people believe that safety is risk control and it is considered as a basic need of human beings.<sup>[4,5]</sup>

Child injuries are a global public health problem. In 2011, the World Health Organization estimates that over 630,000 children under 15 years were killed as a result of injury.<sup>[6]</sup> The WHO report on child injury prevention provides the first comprehensive global assessment

of childhood unintentional injuries and prescribes measures to prevent them. It concludes that if proven prevention measures were adopted everywhere, at least 1000 children's lives could be saved every day.<sup>[6]</sup> In 2013, around 7645 children those are <19 years old died as a result of unintentional injuries in the USA, and the world death rate was 9.3/100,000 children.<sup>[7]</sup>

In other words, children are at risk in home if their safety be neglected of which some studies mentioned 36% of injuries occur in the home environment.<sup>[8]</sup> Studies revealed that high rate of children mortality and morbidity is as a result of unsafe situation and their parent's careless behavior.<sup>[9-12]</sup> However, the cohort studies confirmed that family education can help reduce children injuries, which are exist at home to protect them from risk and provide more home safety issues.<sup>[10,13-16]</sup>

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The literature review in Iran about children injuries (2014) showed that around 20% of Iranian children and adolescents were injured that the frequency of injuries was higher in boys than girls. The most frequent places of injuries were homes,<sup>[8,17,18]</sup> followed by 22.50% in schools, and 17.09% at street. The home injuries comprised falling, burning (directly or indirectly), and cut, whereas most of the school injuries occurred due to falling in playing fields. Therefore, more attention should be paid to the security issues of homes and schools to reduce their injuries.<sup>[19]</sup>

Situation analysis of children in Iran showed that between 19% and 37% of children's death has been due to accidents. Unintentional injuries such as fall, burning, and car crashes seem that a significant proportion of these events is preventable.<sup>[20]</sup> Moreover, other studies revealed that several environmental factors affect the health and safety and threaten people's health during pregnancy, childhood, and adolescence.<sup>[21]</sup> This indicates that safety and safe behavior should be institutionalized within the family culture. Because of the importance of home safety and the main role of family action, this study aimed to evaluate the safety situation in one selected neighborhood of the capital city of Tehran for children aged under five by community-based initiative and its association with measure SDH such as parent's education and socioeconomic gradient.

On the other hand, encouraging family especially mothers to improve their home safety by increasing their awareness and knowledge would be more effective in decreasing children injuries. This experience has been seen in the same study about early child development too.<sup>[22]</sup>

## Methods

This is a cross-sectional study, considering community- and family-based initiative. This study was carried out in the population of Eyvanak area – part of East of Tehran. This area has 3022 kilometer squares and its population comprises 32,000 people. First, literature review about children safety checklist and questionnaires has been done to formulate an appropriate checklist for children and also visit the Ministry of Health and Medical Education of Iran to be sure regarding existed documents. The first draft of checklist was checked by experts with different backgrounds in safety promotion and injury prevention as well as home safety. Furthermore, content and face validity has been checked. It was modified a couple of times to be accepted by the research team. The primary checklist was piloted in several family and then its unclear parts revised based on the Iranian context. For evaluation the social determinants of health these variables were included in the checklist such as age, mother's education, family size, and per capita residential. The final checklist was constructed in five domains with 84 questions. The domains included physical safety with 27 questions; kitchen safety with 14 questions; bath safety with 12 questions; toy safety with 16 questions; and first-aid kit

with 15 questions. As the checklist was under preparation, a group of volunteers named REZAKAR – women volunteers of local community – was selected among the local women community according to their cooperation and their interests.<sup>[23]</sup> They have been trained by several courses in their neighborhood. The courses included safety, early child development, and children nutrition and children oral health. They had at least diploma and helped the researcher's team to train mothers for filling out the home safety checklist. The ten volunteers covered 200 families and followed them by cell phone and telegram connections. They made a canal and added mother's information to it and tried to make a good connection with them.

## Statistical analysis

Mean ( $\pm$  standard deviation) for continuous and percentage for categorical variables was used for statistical analysis. According to expert opinion, children were categorized into two groups: age less than 6 months and more than 6 months. Distributions of different safety domains were separately reported in different age groups.

Multiple linear regression analysis was used to ascertain the different SDH factors that affect the safety scores. Mother's education, family size, and per capita residential were chosen as SDH factors. We used per capita residential as a proxy for socioeconomic status that is generally recognized as an important predictor of various health conditions. According to Sehat (2012), this index is a good predictor of economic status of the Tehranian population.

In each model, we checked the assumptions of linear regression and fixed the violations that were applicable. Because of sparsity in family size, we recode this variable in two categories: families with 3 or <3 members and families with more than three members. We also used log transformation of per capita residential in regression analysis. Statistical significance level was assigned for  $P < 0.05$ . We used IBM SPSS 22.0 software (IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0, Armonk, NY, USA).

## Results

According to Table 1, 160 (80%) of mothers had university educational level, and 51 (25.5%) of them were employed. Only 1% of fathers were unemployed. Half of the families were occupant, and per capita residential was  $30.9 \pm 13.3$  m<sup>2</sup>. Moreover, 132 (66%) of families had 3 or <3 members.

Almost in all of safety domains, families with children older than 6 months had better safety conditions. The difference between two groups in all of the domains was statistically significant except for bath and emergency, which could be considered equal. To assess the influential factors on the safety score, we used multiple linear regression adjusted for mother's education, family size, and

Table 1: The image of a self-report of home safety

**Home safety report card for your child**

Dear Parents:

Thank you for your cooperation in the MAZDAK  
The Home safety report card for your dear children has been completed based  
on the check list .  
please refer to the attached explanation to promote your home safety

the child's name  The volunteer's name

domains	the items related to your child	the mean score for your child	the number of similar cases	your child ranking among 106 children over 6 months
Physical safety	11	8.18	22	51-72
Electronic safety	8	8.75	32	20-51
kitchen safety	14	8.57	16	52-67
Bathroom safety	11	6.82	7	80-86
Toys	15	8.67	3	61-63
First Aid kit	14	6.79	6	54-59
others	7	9.29	12	27-38
Total	80	8.15	1	45

per capita residential. Mother's education had statistically significant effect on the bath and total safety. Education had positive effect on safety score; higher educated mother had 0.82 and 0.52 greater scores in bath and total score, respectively. Family size and per capita residential had no effect on the safety scores.

In children <6 months age, per capita residential had significant effect on the bath scores. With increasing one unit in per capita residential, safety score has increased 3.8 folds. In children with more than 6 months, in various domains, the influential factors were mother's education and per capita residential. In this group, with increasing per capita residential, scores of electric and bath domains were decreased by 0.27 and 0.33, respectively. Higher educated mother had better safety scores in bath and electronic device safety domain.

## Discussion

This study showed the status of home safety for under-five children in the neighborhood of Tehran city and its effect on SDH in two groups, above and under 6 months. With respect to the proportion of educated parents, occupation, and per capita residential, safety of children more than

6 months was better than the safety of <6 months. It might have been they themselves are taking care of them since these children Cannot move by themselves. However, as soon as the child can move and after 6 months, parents found that safety in home would be a risk for them.

In this study, families had a good socioeconomic condition. However, against public considerations, the safety of the house bathrooms had negative relationship to the socioeconomic condition for every family; it means that as much as the family economic conditions gets better, their home safety for their children improved except their bathroom safety, especially for children aged more than 6 months. The research team believes that home safety is not improving as much as economic condition. It seems that deluxe items which has related to high socioeconomic of the families make a treat environment for the children and their safety. So, there isn't direct relation between high economic and more safety home in families.

Black *et al.* showed that low income, lack of transport, and lack of child-care facilities<sup>[24,25]</sup> directly related to the risk of accidental injury in a family however this study shows that the high economic can improve safety but it is not confirmable as it mentioned all of the families in this project had good income according the judgment of their per capita residential, but reduction of safety in their >6 months child has been seen.

Otherwise, in this study, among children <6 months, the family size and per capita residential variables did not have any correlation with the safety domains, but there was an association between mother's education with total safety, electronic, and bath safety.

Children's safety correlated with mother's education, it means that high educated mothers had more safety score for their children. Cheraghi *et al.* showed in their study that "training sessions could effectively improve mothers' knowledge of injury prevention in children aged <5 years."<sup>[26]</sup>

In our study, educated mothers had better knowledge about the safety of their children. These results support the findings presented by Olutayo OG (2013)<sup>[27]</sup> and Ibrahim (2004) that stated mother's age and educational attainment are relevant variables in determination of the knowledge display in case of home accidents causes and prevention.<sup>[6,7]</sup> According to these studies, education makes a significant difference in mothers' knowledge about home accidents, the need to place a high premium on educational program on home accidents, and how it could be managed if it occurs, especially for mothers who have preschool children.

Moreover, Kendrick *et al.* in a cohort study evaluated the usefulness of home safety behaviors for predicting childhood injury, and they stated that "Having fitted and



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working smoke alarms and safe storage of sharp objects in the kitchen were associated with significantly lower hospital admission rates for unintentional injuries, and there was some evidence suggesting that having a stair gate may be associated with a lower hospital admission rate.” An increasing number of safety practices were associated with a reducing risk of hospital admission. These relationships were independent of sociodemographic and family characteristics and ward-level deprivation.<sup>[13]</sup> However, in our study, we observed the relationship between the SDH and different safety domains.

Their study sought to increase home safety behaviors by providing parents more awareness and knowledge about insurmountable “eyewitness” evidence<sup>[13,18]</sup> that their children are likely to handle home hazards when left accessible.

This study clarified the SDH effects on home safety and also it showed our community’s eagerness to improve the home safety, especially for children as an important group. It is possible by increasing community knowledge. We have the capacity of local volunteers for helping parents to improve their home safety for children and decrease children injuries.

## Conclusions

This project was a part of MAZDAK that was a successful model of community-based initiation to improve home safety for children <5 by self-trained checklist. Home injuries which have been threatened children’s life in each country, would be considered as an essential issue for parents. Most of the injuries would be preventable by education and awareness. It showed that an effective way for promoting children safety in the community would be community engagement and family cooperation. Most of the family acknowledged this safety questionnaire was great and it could help them to improve their knowledge to modify their home safety. As the family education can help reduce children injuries, MAZDAK as a model can be run in the other places to check the effects of SDH on home safety for children. This was an experience of improving community knowledge and behavior about home safety by the parents themselves to improve their children safety environment, and it is going to continue the efficacy of intervention soon. Such a MAZDAK model should be considered for policy makers to be considers in child safety environment in various places and decrease the rate of children injuries.

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## Conflicts of interest

There are no conflicts of interest.

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## References

1. World Health Organization. A conceptual framework for action on the social determinants of health. Geneva, Switzerland: World Health Organization; 2010.
2. Viner RM, Ozer EM, Denny S, Marmot M, Resnick M, Fatusi A, et al. Adolescence and the social determinants of health. *Lancet* 2012;379:1641-52.
3. Maurice P, Lavoie MQ, Chapdelaine A, Bélanger Bonneau H, Ellison L. Safety and safety promotion: Conceptual and operational aspects. *Chronic Dis Can* 1997;18:179-86.
4. Koltko-Rivera ME. Rediscovering the later version of Maslow’s hierarchy of needs: Self-transcendence and opportunities for theory, research, and unification. *Rev Gen Psychol* 2006;10:302.
5. Takano T. Health and environment in the context of urbanization. *Environ Health Prev Med* 2007;12:51-5.
6. WHO. Child Injuries; 2011. Available from: [http://www.who.int/violence\\_injury\\_prevention/child/injury/en/](http://www.who.int/violence_injury_prevention/child/injury/en/). [Last accessed on 2016 Dec 21].
7. Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. Web-based Injury Statistics Query and Reporting System (WISQARS). National Center for Injury Prevention and Control Website. Unintentional Fatal and Nonfatal Injuries, Children Ages 19 and Under. Available from: <http://www.cdc.gov/injury/wisqars/index.html>. [Last accessed on 2015 Feb 23].
8. Mohammadi R, Ekman R, Svanström L, Gooya MM. Rationales for home safety promotion in the Iranian primary healthcare system: Results from a pilot study. *Public Health* 2006;120:58-64.
9. Brown KJ, Roberts MC, Mayes S, Boles RE. Effects of parental viewing of children’s risk behavior on home safety practices. *J Pediatr Psychol* 2005;30:571-80.
10. Kendrick D, Maula A, Stewart J, Clacy R, Coffey F, Cooper N, et al. Keeping children safe at home: Protocol for three matched case-control studies of modifiable risk factors for falls. *Inj Prev* 2012;18:e3.
11. Kingma J, Ten Duis HJ. Severity of injuries due to accidental fall across the life span: A retrospective hospital-based study. *Percept Mot Skills* 2000;90:62-72.
12. Bulut M, Koksall O, Korkmaz A, Turan M, Ozguc H. Childhood falls: Characteristics, outcome, and comparison of the injury severity score and new injury severity score. *Emerg Med J* 2006;23:540-5.
13. Kendrick D, Watson M, Mulvaney C, Burton P. How useful are home safety behaviours for predicting childhood injury? A cohort study. *Health Educ Res* 2005;20:709-18.
14. Altundag S, Oztürk MC. The effects of home safety education on taking precautions and reducing the frequency of home accidents. *Ulus Travma Acil Cerrahi Derg* 2007;13:180-5.

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15. Kendrick D. Children's safety in the home: Parents' possession and perceptions of the importance of safety equipment. *Public Health* 1994;108:21-5.
16. Kendrick D, Coupland C, Mason-Jones AJ, Mulvaney C, Simpson J, Smith S, *et al.* Home safety education and provision of safety equipment for injury prevention. *Cochrane Database of Systematic Reviews* 2007:CD005014. DOI: 10.1002/14651858.CD005014.pub2.
17. Alptekin F, Uskun E, Kisioglu AN, Ozturk M. Unintentional non-fatal home-related injuries in Central Anatolia, Turkey: Frequencies, characteristics, and outcomes. *Injury* 2008;39:535-46.
18. Mohammadi R, Ekman R, Svanström L, Gooya MM. Unintentional home-related injuries in the Islamic Republic of Iran: Findings from the first year of a national programme. *Public Health* 2005;119:919-24.
19. Kelishadi R, Qorbani M, Motlagh ME, Ardalan G, Moafi M, Mahmood-Arabi M, *et al.* Frequency, causes, and places of unintentional injuries in a nationally representative sample of Iranian children and adolescents: The CASPIAN-IV Study. *Int J Prev Med* 2014;5:1224-30.
20. Roshanfer P. Situation analysis of children, youth, adolescent and women in Iran. Tehran, Iran: Ministry of health and public of Iran; 2015.
21. Poursafa P, Kelishadi R. What health professionals should know about the health effects of air pollution and climate change on children and pregnant mothers. *Iran J Nurs Midwifery Res* 2011;16:257-64.
22. Malekafzali H, Roshanfekr P. Involving the Community in the Early Child Development ECD Programs: Lessons Learned from the MAZDAK Project in Eivanak Community in Tehran. *Scientific Journal of School of Public Health and Institute of Public Health Research* 2016;14:87-94. [In persian].
23. Malekafzali H, Roshanfekr P. Involving the community in the early child development ECD programs: Lessons learned from the MAZDAK project in eivanak community in Tehran. *Sci J Sch Public Health Inst Public Health Res* 2016;14:87-94.
24. Sehat M, Naieni KH, Asadi-Lari M, Foroushani AR, Malek-Afzali H. Socioeconomic status and incidence of traffic accidents in metropolitan Tehran: A population-based study. *Int J Prev Med* 2012;3:181-90.
25. Black D, Morris J, Smith C, Townsend P. *Inequalities in Health: Report of a Research Working Group*. London: Department of Health and Social Security; 1980. p. 19.
26. Cheraghi P, Poorolajal J, Hazavehi SM, Rezapur-Shahkolai F. Effect of educating mothers on injury prevention among children aged <5 years using the health belief model: A randomized controlled trial. *Public Health* 2014;128:825-30.
27. Olutayo OG. Mother's Education, Age and Knowledge about Home Accident Prevention among Preschool Children in Ilesa Metropolitan City: A Relational Approach. *Journal of Education and Practice* 2013;4:221-8.

