



## Research paper

### Investigating the health belief model structures regarding the preventive factors from the occurrence of accidents and injuries in children under 5 years of age in Fasa city

Seyedeh Samaneh Dehghani<sup>1</sup>, Saeedeh Jafarzadeh<sup>2</sup>, Fatemeh Azadkhan<sup>2</sup>,  
 Mohammad-Rafi Bazrafshan<sup>3</sup>, Pouyan Afzali Harsini<sup>4</sup> , Ali Khani Jaihooni<sup>1</sup> 

<sup>1</sup> Department of Public Health, Fasa University of Medical Sciences, Fasa, Iran

<sup>2</sup> Department of Nursing, Fasa University of Medical Sciences, Fasa, Iran

<sup>3</sup> Department of Nursing, School of Nursing, Larestan University of Medical Sciences, Larestan, Iran

<sup>4</sup> Bachelor's Degree in Public Health, Kermanshah University of Medical Sciences, Kermanshah, Iran

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#### ABSTRACT

**Introduction:** Injuries caused by the accidents are one of the major causes of death in children under 5 years of age. One of the important indexes of the development and health optimization in countries is the mortality rate of children under age 5.

**Aim:** The purpose of this study is investigating the health belief model structures regarding the preventive factors from the occurrence of accidents and injuries in children under age 5.

**Material and methods:** Present cross sectional descriptive study has been conducted on 270 mothers having a child under 5 years of age who have referred to the health centers in Fasa city in 2017. Based on the health belief model, the information are collected via questionnaires and the obtained data are analyzed by the multiple regression SPSS-20.

**Results and discussion:** The predictive structures of this study are the perceived barriers, perceived susceptibility, perceived benefits and self-efficacy. The average score of perceived barriers is 62.24, perceived susceptibility is 45.25, the perceived benefits is 61.22 and the self-efficacy is 50.49. Therefore, the studied variables predict 33.6% of whole performance. Also, except the perceived barriers, a significant and direct relationship is observed between the structure of mothers performance and other structures ( $P < 0.05$ ).

**Conclusions:** According to the average scores of awareness and performance of mothers and other health belief model structures, it is suggested that, training programs in the form of training packages be performed based on this model in order to develop the preventive behaviors from the occurrence of accidents and injuries in children.

Corresponding author: Pouyan Afzali Harsini, Fasa Ibn Sina square, Fasa University of Medical Sciences, Fasa, Iran.

P. Code: 7461686688. Tel.: +989175328065, Fax: +987153357091.

E-mail address: [pooyanafzali@gmail.com](mailto:pooyanafzali@gmail.com).

## 1. INTRODUCTION

Accidents and injuries are some of the major and avoidable reasons of illness and death in most of the countries.<sup>1</sup> With the advent of novel technologies in human lives, the development of communication and urbanization, the progress of health sciences and medicine along with the changes of patterns and lifestyles, these dangerous human health threats cause various losses and damages.<sup>2</sup> Therefore, by 2020, the damages caused by accidents will be the second reason of disability in developing countries and the third reason of death and disability around the world.<sup>1</sup> Although the advancement of technology has controlled the contagious diseases and causes the augmentation of life expectancy and longevity, the noncommunicable diseases and some other social problems, including accidents and injuries, have been increased.<sup>2</sup> Hence, in present age, accidents are not considered as the accidental causes of death, they are the price people pay for the advancement of technology.<sup>3</sup> In this regard, accidents and injuries are some of the main causes of death and disability of children around the world and their reference to the hospitals.<sup>4</sup> Because children are the most vulnerable group of society, they have the largest rate among the victims of accidents.<sup>2</sup> Due to physiological constraints, developmental processes, sensory and motor development, behavioral characteristics and reactive capacity (experience, exploration, adventure and etc.) along with other environmental factors such as safety, the level of monitoring and parental care, children are highly exposed to the accidents.<sup>5</sup>

According to the report of the United Nations World Health Organization (WHO) and the United Nations Children's Fund, daily events kill more than 2000 children and every year, 1 child from 4 children needs health services after the occurrence of injury.<sup>6</sup> Also, according to the forensic statistics of Iran, accidents and injuries are the second reason of children death.<sup>7</sup> So that, for children aged 1–14, accidents are responsible for almost 16.6% of their death. Three main causes of these accidents are traffic accidents (37.5%), drowning (17.9%) and burning (12.1%).<sup>8</sup> Also, 21% of children's deaths is related to the unintentional accidents and injuries in children under 6 years of age, 43% is related to the domestic events and 42.8% is related to the vehicle injuries.<sup>9</sup> Akbarpour et al.<sup>10</sup> (1390/2011 AD) indicated that, in Mazandaran Province, Iran, almost 3242 years of children lives has been lost due to the premature death of children under the age of 15 caused by accidents and injuries. Consequently, due to the high number of children injuries along with the social and economic problems of this issue and the vulnerability of children in front of accidents and injuries, investigating about this issue is highly essential because one of the major goals of the Millennium Development and UNICEF is the complete eradication of children death by 2028. Therefore, it is clear that, providing appropriate strategies to prevent this growing health problem is very important for providing children with health and safety and this issue should be considered as a national goal.<sup>11</sup> Currently, in order to decrease the occurrence of incidents in community,

some preventive measures are sporadically performed along with the educational programs, however, these are not sufficient, because before any planning and taking any actions, it is important to obtain information about the victims of accidents and their reasons for referring to the emergency departments.<sup>12</sup> Also, teaching mothers as the key members of family is very important.<sup>13</sup> Therefore, it is necessary to study the knowledge and attitude of mothers and appropriate studies should be carried out based on the health models and behaviors. The health belief model is one of the patterns that should be considered due to the importance of this problem and taking actions to prevent the accidents and injuries.<sup>14</sup> The health belief theory was presented by Rogers in 1950, considering that, accepting the recommended health behaviors against health threats is a direct action and individual's motivation to protect him/herself.<sup>15</sup> Based on the health belief model, when some factors such as the sensitivity, severity, perceived barriers and benefits, action guides and self-efficacy are felt by human, he adopts the preventive health behaviors.<sup>14</sup>

Sensitivity and the perceived severity structures make the individual to be aware of a health threat, on the other hand, the behavioral motivations (perceived benefits, action guide and self-efficacy) are the reasons of adopting or not adopting health behaviors or preventive behaviors by individuals.<sup>16</sup> Therefore, before taking any action, awareness about the incidences and the characteristics of injured people is important, however, in Iran, except for the sporadic educational programs, basic actions have been not taken for preventing the accidents, because in most parts of Iran, there is not sufficient knowledge about the preventive behaviors in children and other ages. The extent of children's incidents around the world indicates the importance of educating people and preventing these dangers.<sup>6</sup> As a result, most of the injuries caused by accidents are predictable. Therefore, one of the main responsibilities of parents is preventing the occurrence of accidents in their children and considering that the future of every country depends on the active and healthy labor force and by caring and satisfying the physical and spiritual needs of children, the chances of having healthy and efficient adults can be increased.<sup>17</sup> As mentioned by Wong, the future of every society depends on the children of that society, therefore, it is necessary to provide appropriate grounds for the education and socialization of children.<sup>18</sup> As a result, recognizing the patterns of accidents and injuries in children under 5 years of age along with the appropriate planning for decreasing the mortality rate and other possible complications is absolutely essential.

## 2. AIM

Present study investigates the health belief model structures regarding the preventive factors from the occurrence of incidents and accidents of children under age 5 in Fasa city. We hope that, the results of this research present useful evidences for health managers and researchers and provide

strategies for policymakers and healthcare administrators to reduce children mortalities caused by accidents and injuries as well as improving the health of this group of society.

### 3. MATERIAL AND METHODS

Present cross sectional descriptive study has been conducted on 270 mothers having children under 5 years of age who have referred to the health centers in Fasa city in 2017. The sampling of present study has been carried out in multiple steps. Among 6 health centers of Fasa city, 2 of them have been selected and mothers who have referred to these health centers have been chosen randomly. The sample size of this study is considered based on a similar study,<sup>16</sup> where the perceived barriers has the highest value of standard deviation (SD 18.8) with the maximum acceptable error of  $d = 3$  and 99% confidence level ( $\alpha = 1\%$ ) of 270 studied samples. The inclusion criterion includes mothers with the educational level of reading and writing who were consent to participate in study and had a child under age 5. Data have been collected by a standard questionnaire retrieved from the study of Purorajall et al.<sup>16</sup> including a number of demographic questions, questions related to the measure awareness (15 items), questions about the health belief model dimensions (23 items) as well as questions about mothers' performance (20 items) regarding the preventive behaviors from the occurrence of accidents and injuries in their children. In the section of measure awareness of mothers, the correct answer has 1 score and the wrong answer has the 0 score. At the end, the score of each person is calculated based on 100 scores. In section related to the health belief model dimensions, the Likert scale of each question varies from 1 to 6 score, so that, 'I strongly disagree' has the score of 1, 'Disagree' has the score of 2, 'Somewhat disagree' has the score of 3, 'Somewhat agree' has the score of 4, 'I agree' has the score of 5 and 'I fully agree' has the score of 6. Totally, the score of this section is calculated based on 100 scores. In the performance checklist section, the correct preventive behavior from the occurrence of accidents and injuries of children has 1 score and the wrong behavior has 0 score and totally, the score of this section is calculated based on 100 scores.

The accuracy and reliability of this questionnaire have been validated in the study of Poorolajal et al.<sup>16</sup> where in the awareness section, the Cronbach  $\alpha$  equals with 0.77, sensitivity equals with 0.72, perceived severity equals with 0.71, perceived benefits equals with 0.81, perceived barriers equals with 0.81, self-efficacy equals with 0.77 and the guide action equals with 0.73 which are acceptable. Cronbach  $\alpha$  of whole questionnaire equals with 0.84.

The questionnaires have been filled by self-reports and interviews with mothers referring to the health centers. The obtained data are analyzed as codes in SPSS-20 software. For comparing the average of two independent groups, T-test independent is used and for comparing more than two groups, the one-way ANOVA is employed. The internal correlation of model structures is investigated by using Pearson cor-

relation coefficient and the behaviors are predicted by the multiple regression. Also, the health belief model structures and the awareness are selected and analyzed as variables predicting the behaviors. It should be noted that, mothers participated voluntarily with satisfaction.

The limitations of this study were collecting data through self-reporting, being a cross sectional study and performing in a city where according to the limitations of human studies and inability to have a direct observation on mothers' behaviors, results must be generalized with caution.

### 4. RESULTS

In present study, the average ages of children are  $25.35 \pm 15.71$  months and the average ages of mothers are  $34.60 \pm 28.1$ . The demographic information of studied participants are presented in Table 1.

The average score of mothers awareness is 48.27, performance is 56.24, perceived susceptibility is 45.25, perceived benefits is 61.22, perceived severity is 50.11, perceived barriers is 62.24, self-efficacy is 50.94 and the performance guide is 30/61. Pearson correlation coefficient showed that there is a significant direct relationship between the performance, the perceived susceptibility, self-efficacy and the perceived benefits, but there is a significant diverse relationship between the performance and perceived barriers (Table 2).

The multiple linear regression analysis is used for investigating the prediction of mothers' performance by health belief

**Table 1. Demographic characteristics of subjects.**

Variable	Number	Percent
Child sex		
Boy	155	57.40
Girl	115	42.60
Number of children		
1 Child	112	41.48
2 Children	89	32.96
3 Children	69	25.56
Mothers education		
Elementary	35	12.96
Middle school	74	27.40
High school	125	46.29
Higher education	36	13.35
Fathers education		
Elementary	24	8.88
Middle school	86	31.85
High school	104	38.51
Higher education	56	20.76
Mothers job		
Housewife	217	80.37
Employee	36	13.35
Student	12	4.44
Others	5	1.84
Fathers job		
Employee	82	30.37
The worker	65	24.07
Self-employment	108	40.00
Others	15	5.56

model structures and other variables. Generally, the studied variables predict 33.6% of mother's performance. Also, the predictive value of perceived sensitivity and self-efficacy of mothers' performance is higher than the other factors (Table 3).

## 5. DISCUSSION

Accidents and injuries of children are among the most important issues of public health and community development.<sup>19</sup> So that, reducing the burden of injuries is an international health goal.<sup>20</sup> Because children under 5 years of age cannot understand the concept of danger and are the beginners in distance and depth estimation and have much mobility, they are highly exposed to the accidents and injuries. Hence, preventing accidents and injuries of children under the age of 5 is an important issue and mothers play an important role in this regard.<sup>18</sup> The purpose of present study is investigating the health belief model structures regarding the preventive factors of the occurrence of accidents and injuries in children under the age of 5. The results show that there is a direct relationship between mothers' performance and the perceived susceptibility. In the study of Fathi (1393/2014 AD), the health belief model and the performance of women referred to Khorramabad health centers have been investigated and his results indicated that, the perceived sensitivity of mothers is higher than the average rate, indicating a significant direct relationship with their performance.<sup>9</sup> The results of this study with the research of Poorolajal et al.<sup>16</sup> and other similar investigations include the preventive behaviors of the growth of impairment in children aged from 6 to 12 months,<sup>21</sup> the preventive behaviors of urinary tract infections in children, the use of safety belts in automobiles,<sup>22</sup> preventive behaviors of medication abuses<sup>23</sup> and mothers' participation in screening the hypothyroidism of neonates.<sup>24</sup> In current study, a significant direct relationship between the performance and mothers' self-efficacy is observed. In the study of Meimanat Abadi<sup>25</sup> and Rakhshani,<sup>26</sup> the average score of mothers' self-efficacy has a direct relationship with their performance which is in a good agreement with the results of present study. Hence, it can be stated that, increasing the assurance and self-confidence of mothers about their ability to control and prevent harms from their children is an effective step. Since educating parents is a key element in the improvement of health and helps the increase of parents' ability in health fields, educating parents by providing appropriate information about children conditions and characteristics improves parents' adaptation mechanism. Also, it makes parents to understand their child's condition and also makes them to play an efficient role in the development of children's health. This will also cause the increase of mothers' self-efficacy. The obtained results show that, there is a significant direct relationship between mothers' performance and perceived benefits. In the studies of Meimanat Abadi et al.,<sup>25</sup> Fathi et al.,<sup>9</sup> Rakhshani et al.,<sup>26</sup> Poorolajal et al.<sup>16</sup> and Mehri et al.,<sup>27</sup> a significant and direct relationship between mothers' perfor-

**Table 2. Relationship between health belief model structures and mothers performance.**

Variable	Mothers performance	
	P	R
Perceived susceptibility	0.001	0.171
Perceived severity	0.412	0.680
Perceived benefits	0.001	0.215
Perceived barriers	0.001	-0.055
Self-efficacy	0.001	0.234
Practice guide	0.341	0.261
Awareness	0.090	0.078

**Table 3. Linear regression analysis of variables and mothers performance.**

Variable	$\beta$	B	P	Dependent variable
Mothers age	-0.024	-0.36	0.151	Mothers performance $R^2 = 0.336$ $R^2_{adjusted} = 0.036$
Fathers age	-0.135	-0.215	0.212	
Child's age	0.104	0.212	0.001	
Perceived susceptibility	0.112	0.236	0.001	
Perceived severity	0.190	0.213	0.325	
Perceived benefits	0.090	0.104	0.021	
Perceived barriers	-0.026	-0.021	0.265	
Self-efficacy	0.201	0.254	0.001	
Practice guide	0.054	0.108	0.098	
Awareness	0.040	0.078	0.612	

mance and perceived benefits has been reported which is in a good agreement with the results of present paper. It seems that, mothers' attention to the provided recommendations and supervising the activities of children inside and outside the home has contributed to children health which can be an effective factor for promoting the perceived benefits of mothers.

The findings show that, there is a diverse relationship between mothers' performance and perceived barriers. Mothers suffer from some problems such as tiredness and constant attention to the child. These problems are listed as the serious barriers of controlling the occurrence of accidents and injuries in their child. Therefore, removing barriers with the help of family members as one of the driving forces for promoting the safety behaviors of mothers is absolutely necessary.

Also, the obtained results indicated that, there is no statistically significant relationship between the performance, awareness, perceived severity and practice guide of mothers. This fact is not coincident with the findings Meimanat Abadi et al.<sup>25</sup> and Fathi et al.<sup>9</sup> Also, in this study, the average scores of awareness and mothers' performance are 48.27 and 56.24, respectively, which are in accordance with the results of Fathi.<sup>9</sup> Therefore, it seems that, half of mothers are not

aware of preventive measures of accidents and injuries in their children which can lead to the occurrence of accidents and injuries in children.

In the study of Khazaei (2009), it is stated that, children referred to the emergency centers of Birjand city with the highest rate of incidence were toddlers (35%), 48.1% of which had domestic injuries, 39.9% had road accidents, 16.9% had been fallen and 16.4% had been fallen down from height.<sup>28</sup> As a result, the average score of mothers' awareness and performance is related to the safety behaviors for preventing the injuries in children under the age of 5, showing that, failure in observing the safety principles in environment around child and not fixing the possible risks in playing areas may cause the injuring or even death of children. Therefore, observing the safety principles and proper supervision of parents should be considered as a priority of health development. Also, in present study, the predictive power of perceived susceptibility and self-efficacy is considered as powerful predictive variables of mothers' performance in safety measures. Ebadifar et al.<sup>29</sup> showed the perceived sensitivity and self-efficacy of mothers as the most sensitive and the best predictive factors for preventing the occurrence of accidents and injuries in children and his obtained results were in good agreement with the results of present study.

## 6. CONCLUSIONS

Children live in a world where the reason of their injuries is usually due to the adult's mistakes. There is no doubt that the parents play the most important role in reduction of accidents statics. Therefore, they must receive necessary and appropriate awareness and be cautious about children based on their age and use the preventive measures from the accidents. Based on the scores obtained from the present study about the health belief model structures, it is suggested that, the direct and indirect training programs should be developed through multimedia educational packages to optimize the preventive behaviors from the occurrence of accidents and injuries in mothers as the first child caregivers.

### Conflict of interest

The authors declare that they have no competing interests.

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