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Towards Safe Use of Tractors on Farm: Application of Health Belief Model

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Abstract

While non-observance of safety instructions in working with tractors is one of the causes of financial and human losses in the world's agricultural sector, this study was conducted to explore factors influencing safety behavior of farmers in working with tractors through the lens of the health belief model. A cross-sectional survey was applied for studying 250 Iranian tractor-owner farmers who were selected using stratified random sampling technique. Data were collected using a questionnaire. Results indicated that the most of farmers do not pursue proper safety instructions while working with tractors. Based on the findings, the health belief model was able to explain a significant part of the variance of farmers' safety behavior in working with tractors. Perceived susceptibility, perceived benefits, self-efficacy, perceived severity and perceived barriers were the significant variables influencing safety behavior. Farmers perceived some barriers on their way to consider the safety instructions in working with tractor and believed that they do not have high self-efficacy, particularly enough financial ability to observe these instructions in practice. These findings provide some recommendations for policymakers, as well as agricultural extension organization to raise their safety behavior about working with tractors.

Keywords: Farmers; Health Belief Model; Safety Behavior; Tractor

Introduction

Agriculture is a dangerous job in terms of its high work-related illness, disasters and mortality rates [1]. Farmers are exposed to all kinds of accidents and diseases. Although advances in personal protection technologies and awareness of the importance of safety in the farm have improved the health and well-being of farmers, but the widespread use of equipment, machinery and chemical inputs has created a variety of diseases and occupational injuries [2]. According to [3], "the agricultural fatal work injury rate in US was 22.8 per 100,000 full-time equivalent workers - nearly seven times the all-worker fatal injury rate of 3.4 per 100,000 full-time equivalent workers". Similar statistics are found in Canada, where from 1990 to 2012, there were 2324 agriculture related mortalities in Canada, an average of 101 mortalities each year [4]. Also, based on the International Labor Organization [5], "at least 170,000 agricultural workers die each year at work". [6] indicated activities related to agricultural machinery and especially tractors have been the cause of a significant part of these injuries in the agricultural sector.

Tractors, particularly older tractors which lack equipment such as seat belts or driver cabs, are one of the causes of work accidents in the farms [7]. Riding on tractor for a long time and constantly sitting on non-standard seats, increases the possibility of adverse accidents when working with this machine. The most common accident is when the driver gets stuck under the tractor when it overturns to the side or back. Overturning may occur as a result of working on sloping or uneven lands near waterways and ditches, carrying heavy loads, bypassing at high speeds, pulling loads following tractors, or road accidents [8]. Also, noise from working with the tractor can damage the hearing system. In addition, vibration from sitting on a tractor can cause muscle and skeletal damage. Accidents caused by working with tractors are not limited to these cases, but in this regard, we can also mention accidents such as falling while going up or down the tractor and injuries caused by moving under the foliage of trees [9]. Overall, use of machines, including tractors in the agricultural sector, although saving money and time, is always associated with risks to farmers' health. For example, in 2017 in the United States, 258 deaths were reported among farmers due to occupational accidents, 103 of which were related to working with agricultural machinery, particularly tractors [10]. In addition, based on a study by [11], tractors are responsible for about 35% of deaths in the Italian agricultural sector.

In Iran, although there are no accurate statistics on workplace accidents in the agricultural sector, but disperse studies have been conducted in this field. For example, a study by [12] in Bam city in the southeast of Iran showed that in the period from March 2005 to March 2006, about 70 work-related accidents occurred for farmers in this city, about 42% of which were related to work with agricultural tools, particularly tractors [13]. In Iran, safety and health education in agriculture is not considered as much as the industrial sector and most farmers are not covered by occupational health. In addition, the level of communication between occupational health units and the agricultural sector is much lower than the relationship between these units and other industries [14]. This is while; paying attention to safety issues on the farm is not only a moral obligation, but also an executive and productive necessity [13].

Based on a study by [15], one of the most important structural problems in rural environments that lead to work-related accidents in these areas is the lack of knowledge and inappropriate safety behaviors among individuals. If farmers follow the safety tips, working with agricultural equipment is not dangerous. Even though, safety considerations should be considered in designing and creating agricultural equipment and machinery, the reduction of work accidents largely depends on recognizing safety behavior of farmers working with this equipment and improving their behavior in various ways [13]. Since the issue of safety in the agricultural sector in many countries of the world has been neglected and unknown compared to the industrial sector, it is the duty of agricultural researchers to take action to fill the existing research gap. This is especially more evident when working with agricultural machinery, including tractors. Therefore, the present study aims to understand the safety behavior of Iranian tractor-owning farmers in the use of tractors through the lens of the health belief model (HBM). This approach can help to identify factors affecting safety behavior of farmers and provide practical solutions to reduce occupational accidents caused by working with this agricultural machine.

Health belief model (HBM) was introduced in the 1950s by U.S. Public Health Service to clarify why people do not take part in the health prevention programs [16]. The HBM consists of six structures that include "perceived susceptibility", "perceived severity", "perceived benefits", "perceived barriers", "self-efficacy" and "cues to action" (Figure 1). Perceived susceptibility is individuals' subjective perception on the risk of involved an illness [17]. Perceived severity is an individuals' assessment of the seriousness of the negative effects of a disease on their life if they *engage* it [18]. Perceived benefit is individuals' evaluation of the value to take a proposed act to decrease negative effects of a disease [16]. Perceived barriers are individuals' perception about the obstacles which are stand in the way of behavior change [19]. Self-efficacy is the individuals' confidence in their personal ability to success in an action to achieve favorable outcomes through dealing with any obstacle in the way that [18]. Cues to action refer to anything that triggers or reminds people to take action [20].

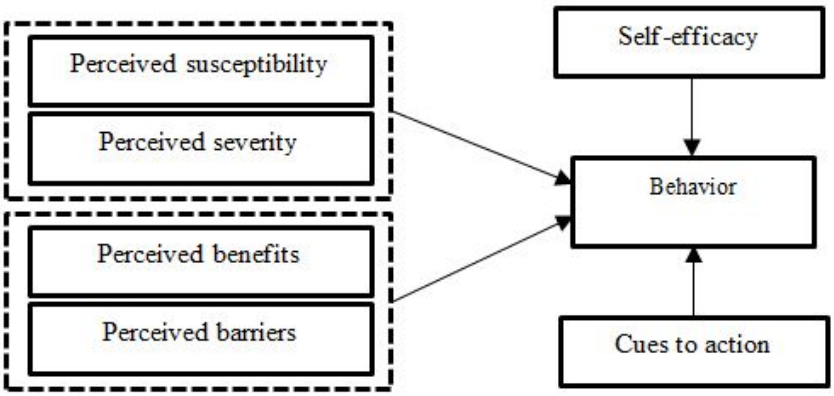

Figure 1: Health belief model

The HBM has been used in some studies to screen safety behavior of people in dangerous and harmful conditions. [21] applied the HBM to investigate safety behavior of farmers in using personal protective equipment when working with pesticides. Results of this research indicated six constructs of the HBM including perceived sensitivity, perceived susceptibility, perceived benefits, perceived barriers, self-efficacy and cues to action had significant effects on the farmers' safety behavior. In another study, [22] evaluated the influence of educational programs based on the HBM on brucellosis preventive behavior among traditional ranchers in rural areas of Iran. In this study, ranchers were randomly selected and divided into experimental and control groups. The experimental group received educational intervention through film screening, video and text messages. Results revealed that educational intervention relying the HBM can advance brucellosis preventive behaviors among ranchers. [23] used the HBM to investigate safety behavior of Nepalese farmers and retailers when handling pesticides. Results indicated that most farmers did not pursue proper safety measures in using pesticides, which it was because some barriers such as feeling inconvenient and the unavailability of safety tools. Also, though the most of retailers were conscious of the negative influences of pesticides on their own, animals, birds, fishes, and honey bees health, but they lacked the stimulant to accept the required safety measures while handling these chemical poisons. [24] applied the HBM to evaluate farmers' occupational health behavior. They found that perceived susceptibility, perceived benefits, cues to action, and perceived self-efficacy have significant impact on the farmers' occupational health behavior. Generally, these studies highlight the potential of the HBM to illustrate safety behavior of people, particularly for investigating farmers' occupational safety behaviors. Therefore, we used this model as the theoretical framework of present study and according to it, the following hypotheses were designed:

H1. More perceived susceptibility will cause more safety behavior.

H2. More perceived severity will cause more safety behavior.

H3. More perceived benefits will cause more safety behavior.

H4. More perceived barriers will cause less safety behavior.

H5. More self-efficacy will cause better safety behavior.

H6. More cues to action will cause better safety behavior.

Materials and Methods

Participants

A cross-sectional survey was applied for studying farmers' safety behavior in the use of tractors. Target group was a community of 720 tractor-owner farmers in Kermanshah, a county of Kermanshah province in western Iran. (Figure 2). 250 farmers were selected using stratified random sampling technique.

Figure 2: Study site

The median age of the partcipants was about 42 years with a standard deviation (SD) of 4.72. 12.87 % were single and 87.20 % were married. The average working experience of the subjects was 20.56 years (SD= 5.56). The mean farm size was 9.97 (SD= 1.89) with minimum 5 and maximum 15 hectares. The average income of the farmers was approximately 33 milion tomans (about $1,178 at the time of the study) (SD= 7). In terms of frequency distribution, 165 people (66 %) had an income between 20 to 30 million tomans, 48 people (19.20 %) had an income between 30-40 million tomans, 29 people (11.60 %) had an income between 40-50 million tomans and 8 people (3.20 %) had an income between 50-60 million tomans. A large number of farmers (76.40 %) had a high school equivalency degree, 4.40 % had elementary level education, 5.20 % had a middle school level education, 4 % had a university degree, and 10 % were illiterate.

Data Collection and Analysis Techniques

A structured questionnaire including items to measure the HBM variables and socio-demographic variables was constructed for data gathering. For designing questionnaire, a wide literature review was conducted on the occupational safety behvior of people, particularly the studies that considered the HBM as their theoretical model. In order to measurement of the HBM constructs, we inspired from the statements that were used in the previous studies for measuring these constructs [e.g. 25, 26, 27, 28]. All the HBM variables were measuerd on a five-point Likert scale to decrease the statistical problem of extreme skewness. To measue socio-demographic characteristics, questions were asked regarding age, work experience, farm size, income, marital status and education level. Then, the questionnaire was discussed with the agricultural researchers and experts so that its questions were examined in terms of concept, expression and appearance. In the next step, to determine the reliability of the questionnaire, a pilot study was conducted on 32 tractor-owner farmers outside the statistical sample. Cronbachs' alpha coefficients for safety behavior, perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self-efficacy and cues to action were 0.735, 0.771, 0.715, 0.712, 0.756, 0.789 and 0.762 respectively which indicate the reliability of the measurement tool. Due to low education level of some participants, face-to-face interviews were used by the researchers for filling out the questionnaire. The average time required

to collect data from each tractor-owner farmer was about 40 minutes. SPSS and AMOS software version 21 were applied for analyzing the research data.

Results

Status of Research Variables Among the Participants

According to Table 1, the mean value of safety behavior of the study participants in working with tractor was low (M= 2.36; SD= 0.66). Perceived severity, self-efficacy and cues to action in order with (M= 2.48; SD= 0.92), (M= 2.45; SD= 0.89) and (M= 2.26; SD= 0.98) also showed low mean values with attention to the range of 1 to 5. The mean values of perceived susceptibility (M= 2.59; SD= 0.84) and perceived benefits (M= 2.71; SD= 0.61) were moderate, while perceived barriers (M= 3.53; SD= 0.84) had a relatively high mean value among the studied farmers.

Table 1: Mean and standard deviation of research variables

Variables*	Mean	St.d
Safety behavior	2.36	0.66
Perceived susceptibility	2.59	0.84
Perceived severity	2.48	0.92
Perceived benefits	2.71	0.61
Perceived barriers	3.53	0.84
Self-efficacy	2.45	0.89
Cues to action	2.23	0.98
* The range of all variables was converted to 1-5		

Relationship between Variables

The results of Pearson correlation test in Table 2 indicates a significant positive correlation between safety behavior and the variables of perceived susceptibility (r=0.34; P<0.01), perceived severity (r=0.69; P<0.01), perceived benefits (r=0.65; P<0.01), self-efficacy (r=0.65; P<0.01), and cues to action (r=0.59; P<0.01). Also, a significant negative correlation (r=-0.39; P<0.01) was observed between safety behavior and perceived barriers. In sum, the findings reveal significant correlations among farmers' safety behavior and the HBM constructs.

Table 2: Pearson's Correlation matrix

	1	2	3	4	5	6
1. Perceived susceptibility	1					
2. Perceived severity	0.69**					
3. Perceived benefits	0.29	0.21				
4. Perceived barriers	0.32*	0.28	-0.43**			
5. Self-efficacy	0.11	0.08	0.19	0.07		
6. Cues to action	0.28*	0.36*	0.03	0.06	0.29*	
7. Safety behavior	0.34*	0.69**	0.65**	-0.39**	0.65**	0.59**

Determinants of Farmers' Safety Behavior when Working with Tractors

Structural equation modeling (SEM) analysis was implicated for testing the research hypotheses regarding the effect of the HBM variables on the safety behavior of tractor-owner farmers. The results of the SEM analysis are indicated in Figure 3. Based on this figure, the independent and dependent variables of the research were considered as latent variables and in the form of first-order factor models in the structural equation, and only the items used in the questionnaire to measure each variable were entered into the structural equation as observed variables. In the SEM, the research model should demonstrate goodness of fit for the experimental data. Table 3 shows the fit indices of the structural equation model of the factors influencing safety behavior among tractors-owner farmers. To have a good fit, the significant value of chi-square should be greater than 0.05. As shown in this table, the significant value of chi-square is 0.101, which indicates a good fit for the measurement model. Also, the value of variance of the error of approximation (RMSEA) was 0.051. Since the value of the root mean square error approximation (RMSEA) between 0.03 and 0.08 can indicate a good fit for a model [29], the value obtained for RMSEA shows that the measurement model has a good fit. In addition, according to Table 3, the value of comparative fit index (CFI) is 0.914, the value of goodness of fit index (GFI) is 0.951, and the value of normed fit index (NFI) is 0.923. Since according to [30], the acceptable values for these indicators are above 0.90, so the measurement model has a good fit.

Table 3: Goodness of fit indices for the HBM

Indices	Chi-square ($\chi 2$)	df	Sig.	RMSEA	CFI	GFI	NFI
Value	261.12	181	0.101	0.051	0.914	0.951	0.923
Acceptable value	-	-	>0.05	≤0.08	≥0.90	≥0.90	≥0.90

According to the findings of SEM analysis (Fig. 3), perceived susceptibility (β=0.54; P=0.002) had the most positive effect on the safety behavior of working with tractors among the studied farmers. After that, two variables, perceived benefits (β=0.48; P=0.001) and self-efficacy (β=0.43; P=0.001) had the most positive effects on the safety behavior of the studied subjects. Perceived severity (β=0.39; P=0.032) also had positive effect on the safety behavior of tractor-owner farmers. While, perceived barriers (β=-0.41; P=0.025) had a negative and significant effect on the safety behavior of working with tractors among the studied farmers. unlike some previous studies, cues to action (β=0.14; P=0.21) did not have significant influence on the safety behavior. Overall, the results of SEM confirmed the study framework in which out of six path coefficients, five of them were statistically significant and could explain about 0.49% of the changes in tractor safety behavior among the studied farmers.

Discussion

According to the results, farmers showed a low safety behavior when working with tractor. This was while they imagined some barriers on their way to observe the safety instructions in working with tractor and believed that they did not have sufficient self-efficacy, particularly enough financial ability to observe these points. As [31] state, perceived barriers as the judgment of the degree of difficulty of a set of various challenges can prevent implementation of a certain health and safety behavior. Also, as [32] state, self--efficacy can influence the endeavor individuals put forth to change risk behavior and the insistence to continue striving in spite of barriers that may decrease motivation. Low self-efficacy of farmers in this study can be a one of the reasons of unfavorable safety behavior when working with tractors. In addition, findings revealed low average scores for perceived severity and cues to action among the studied subjects. As [33] and [34] state low perceived severity can lead to low protective behavior.

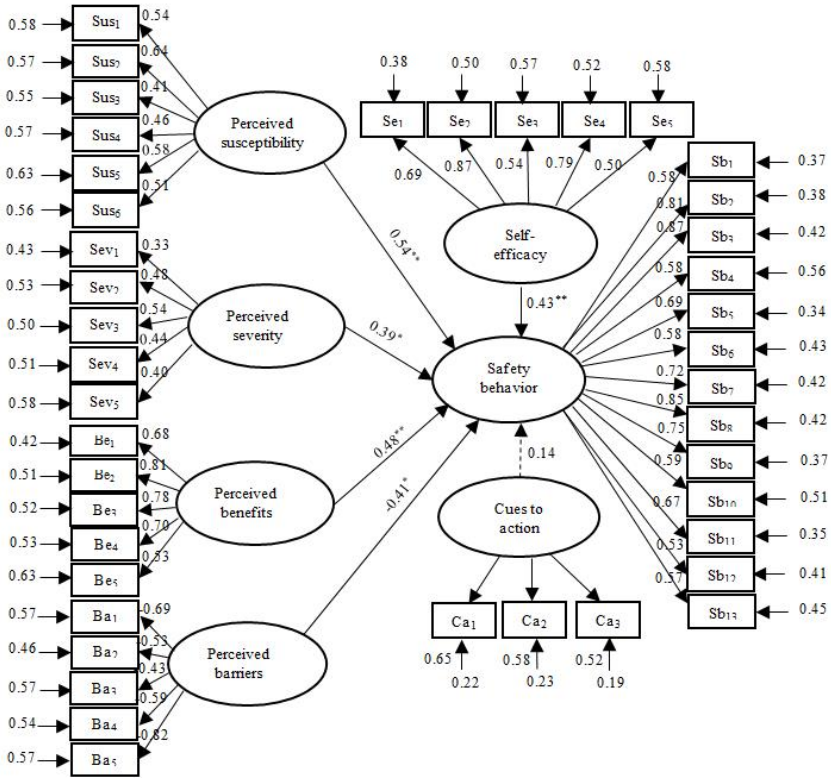

Figure 3: Structural equation modeling analysis of factor influencing safety behavior of working with tractor

The results of SEM to explore factors affecting safety behavior when working with tractors indicated that the HBM could predict about 49% of variance of safety behavior among tractor-owner farmers. Looking the past studies indicates that our study has predicted an appropriate level of safety behavior and the HBM is a convenient model for prediction of farmers' safety behavior. This is in line with the results of studies by [21], [24] and [35]. Based on the results, perceived susceptibility was the strongest predictor of farmers' safety behavior. This finding support H1. The high power of perceived susceptibility among the HBM constructs in predicting safety behaviors has been confirmed in many studies, including [36], [37] and [38]. This finding emphasizes that farmers show proper safety behavior when they feel the danger in working with the tractor. In this regard, many studies indicated that intervention based on the HBM influences and raises people susceptibility, so that the probability of risky behaviors decreases [39]. Perceived benefits and self-efficacy were two other variables of the HBM that present study indicated their significant influences on the safety behavior of working with tractors among the studied farmers. These results while offer support for H3 and H5, respectively, are in congruent with the results of studies by [37] and [40]. These imply that people are motivated to change their behavior if they come to the conclusion that there are benefits for them in this behavior change and also they have the facilities, conditions and ability required for this behavior change. Perceived severity was another variable that showed positive effect on the safety behavior of tractor-owner farmers. This result offer supports H2. Perceived severity refers to individual's belief about the extent and importance of the threat [41]. This finding is congruent with the results of studies by [42] and [43]. For instance, [42] found out that perceived severity is a vital factor affecting the protective behavior of women in Morocco. According to the findings, perceived barriers was another significant factor influencing safety behavior of farmers, while its influence was negative. This finding led us to support H4. Time-consuming of checking all parts of tractor before moving and not having enough financial ability to equip the tractor with safety devices such as bumper seat were among the obstacles that prevent proper safety behavior by the studied farmers. The negative and significant influence of perceived barriers on the protective and safety behavior has been emphasized in various studies such as [44] and [45]. Findings indicated that cues to action was not a significant variable for prediction of safety behavior of farmers in working with tractor, therefore H6 was rejected. Some previous studies [e.g. 46, 47] have indicated that cues to action as a behavioral driver may be heterogeneous, and different personal circumstances of people may complicate the effect of this variable. Therefore, the insignificant effect of cues to action should be more examined.

Based on the results, it is suggested to consider the following considerations in future policies. Because perceived susceptibility was the most important constructs influencing safety behavior, providing education programs about the negative consequences of not following safety tips when working with tractors can improve sensitivity of farmers about the necessity of observing these points in practice. Since equipping tractors with safety equipment is costly and farmers face various barriers including financial obstacles, it is suggested that government support farmers by paying subsidies or loans to farmers. However financial support should not be the only target, but it is essential to focus on removing the perceptual barriers of farmers regarding the importance and benefits of observing safety points in working with tractors. Finally, present study is not free of limitations, so it opens up the ways for future research. For example, generalizations of the results should be made with caution because different cultural, social and economic situations may influence safety behavior of farmers in different societies. This is especially important since not many studies have been performed on the safety behavior in working with tractors in the agricultural farms.

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References

1. Koroma ET, Kangbai JB (2002) Agro-industrial accidents linked to length of service, operation site and confidence in employer adherence to safety rules. BMC Public Health 20: 591.

2. Ghiasvand Ghiasi F, Ghiasvand Ghiasi F (2017) Analysis of factors affecting health and safety behavior of farmers (worker-related complications): Case study of Ghazving city. QUID 542-8.

3. US Department of Labor and Bureau of Labor Statistics (2015) National census of fatal occupational injuries.

4. Canadian Agricultural Injury Reporting (2016) Agriculture-Related Fatalities in Canada.

5. ILO (2009) Agriculture: A hazardous work.

6. Rondelli V, Casazza C, Martelli R (2018) Tractor rollover fatalities, analyzing accident scenario. J Safety Res 67: 99-106.

7. Abubakar MS, Ahmad DF, Akande FB (2010) A review of farm tractor overturning accidents and safety. Pertanika J Sci Technol 18: 377-85.

8. Dehpour MB (2002) Principles of safety in agricultural machines. University of Guilan 546.

9. ILO. Safety and health in agriculture. Research Report. Labour Protection Department, International Labour Organization, Switzerland.

10. U.S. Department of Labor and Bureau of Labor Statistics (2018) Agricultural employment.

11. Cecchini M, Bedini R, Mosetti D, Marino S, Stasi S (2018) Safety knowledge and changing in behavior in agricultural workers: An assessment model applied in central Italy. Saf Health Work 9: 164-71.

12. Esmaili A, Vazirinejad R, Shahrokhi F (2009) An annual survey of work- induced accidents in injured farmers referring to health centers in Bam. Tibbi-i-kar Research Center of Industry Related Diseases 1: 42-46.

13. Karami G, Bijani M, Salamat E (2014) Agricultural experts' safety knowledge toward work with agricultural machinery in south west of Iran. J Occup Hyg Engin 1: 30-39.

14. Moradhaseli S, Mirakzadeh AA, Rostami F, Ataei P (2018) Assessment of the farmers' awareness about occupational safety and health and factors affecting it; A case study in Mahidasht, Kermanshah province. Int J Health Promot Educ 6: 23-29.

15. Yuan F, Qian D, Huang C, Tian M, Xiang Y et al. (2015) Analysis of awareness of health knowledge among rural residents in Western China. BMC Public Health 31: 15-55.

16. Abraham Ch, Sheeran P (2015) The health belief model. In: Conner M, Norman P. Predicting and changing health behavior (Edition 3). Open University Press 456.

17. Lei F, Chen WT, Brecht ML, Zhang ZF, Lee E (2022) Health beliefs toward lung cancer screening among Chinese American high-risk smokers: Interviews based on Health Belief Model. Int J Nurs Sci 9: 378-88.

18. Siddiqui TR, Ghazal S, Bibi S, Ahmed W, Sajjad SF (2016) Use of the health belief model for the assessment of public knowledge and household preventive practices in Karachi, Pakistan, a dengue-endemic city. PLoS Negl Trop Dis 10: e0005129.

19. Gerrig RJ, Zimbardo PhG, Campbell AJ, Cummings SR, Wilkes FJ (2012) Psychology and Life. Pearson Education Australia 727.

20. Tweneboah-Koduah EW (2018) Social marketing: Using the health belief model to understand breast cancer protective behaviours among women. Journal of Philanthropy and marketing 23: e1613.

21. Seydi M, Rezaei R (2020) Factors affecting farmers' safety behavior in the use of personal protective equipments in working with pesticides in Zanjan county: An application of health belief model. IAEEJ 15: 45-63.

22. Eskandari Z, Bashirian S, Barati M, Soltanian AR, Hazavehi SMM (2017) The effect of educational program based on the health belief model on brucellosis preventive behaviors among traditional ranchers in rural areas of Hamadan Province. J Educ Community Health 3: 16-23.

23. Bhandari G, Atreya K, Yang X, Fan L, Geissen V (2018) Factors affecting pesticide safety behaviour: The perceptions of Nepalese farmers and retailers. Sci Total Environ 631: 1560-71.

24. Moradhaseli S, Ataei P, Van den Broucke S, Karimi H (2021) The process of farmers' occupational health behavior by health belief model: Evidence from Iran. J Agromedicine 26: 231-44.

25. Rezaei R, Mianaji S (2019) Using the health belief model to understand farmers' intentions to engage in the on-farm food safety practices in Iran. JAST 21: 561-74.

26. Satyapriya A, Bishnoi S, Singh S, Singh KN, Ray M et al. (2020) Nutritional health belief model for understanding motivational health behaviour of farmers. Irjee 20: 48-54.

27. Gupta SD, Fournié G, Hoque MA, Henning J (2020) Factors influencing chicken farmers' decisions to implement prevention and control measures to reduce avian influenza virus spread under endemic conditions. Transboundary & Emerg. Dis 68: 194-207.

28. Jemberu WT, Mourits MCM, Hogeveen H (2015) Farmers' intentions to implement foot and mouth disease control measures in Ethiopia. PLOS ONE 10: e0138363.

29. Sakip SRM, Johari N, Aldrin A, Salleh MNM (2013) Assessing sense of community dimension in residential areas in the Malaysian context. Procedia - Social and Behavioral Sciences 105: 655-63.

30. Meyers LS, Gamst G, Guarino AJ (2006) Applied multivariate research: design and interpretation. Sage, London.

31. Sharma M, Romas JA (2011) Theoretical foundations of health education and health promotion (2nd Edition). Sudbury MA: Jones and Bartelett 70-80.

32. Zamfir AM, Mocanu C (2020) Perceived academic self-efficacy among Romanian upper secondary education students. Int J Environ Res Public Health 17: 4689.

33. Fikriana R, Fahrany F, Rusli SA (2021) Health belief associated with adherence to health protocol in preventing coronavirus diseases on patients' family. Open Access Maced J Med Sci 9: 1011-5.

34. Luo Y, Cheng Y, Sui M (2021) The moderating effects of perceived severity on the generational gap in preventive behaviors during the COVID-19 pandemic in the U.S. Int J Environ Res Public Health 18.

35. Tajeri Moghadam M, Raheli H, Zarifian Sh, Yazdanpanah M (2020) The power of the health belief model (HBM) to predict wa-

ter demand management: A case study of farmers' water conservation in Iran. J Environ Manage 263: 110388.

36. Galloway RD (2003) Health promotion: Causes, beliefs and measurements. Clin Med Res 1: 249-58.

37. Jones CL, Jensen JD, Scherr CL, Brown NR, Christy K et al. (2015) The health belief model as an explanatory framework in communication research: Exploring parallel, serial, and moderated mediation. Health Commun 30: 566-76.

38. Rezaei Jaberee S, Aghamolaei T, Mohseni S, Eslami H, Hassani L (2019) Adopting self-medication prevention behaviors according to health belief model constructs. Hormozgan Medical Journal 24: e94791.

39. Brewer NT, Chapman GB, Gibbons FX, Gerrard M, McCaul KD et al. (2007) Meta-analysis of the relationship between risk perception and health behavior: The example of vaccination. Health Psychol 26: 136-45.

40. Karl JA, Fischer R, Druica E, Musso F, Stan A (2021) Testing the effectiveness of the health belief model in predicting preventive behavior during the COVID-19 pandemic: The case of Romania and Italy. Front Psychol 12: 627575.

41. Kuang K (2020) The use of interactive technologies in health promotion and education. In: Kim J, Song H. Technology and health promoting attitude and behavior change.

42. Jadil Y, Ouzir M (2021) Exploring the predictors of health-protective behavior during the COVID-19 pandemic: A multi-country comparison. Environ Res 199: 111376.

43. Indumathi P, Swain D, Priyadarshini T, Jacob J, Tigga R (2022) Knowledge, perceived threats and protective behaviour related to COVID 19 among pregnant women. Asian J Psychiatr 72: 103091.

44. Albadr T, Alfawza S, Aljarb B, Alshehri R, Mahboub S (2021) Use of health belief model to explain the behaviour of following safety measures during the use of household chemical products among adult females in Riyadh. J Res Med Sci 9: 9-14.

45. Zobeidi T, Yazdanpanah M, Komendantova N, Sieber S (2021) Factors affecting smallholder farmers' technical and non-technical adaptation responses to drought in Iran. J Environ Manage 298: 113552.

46. Matute J, Palau-Saumell R, Meyer J, Derqui B, Jiménez-Asenjo N (2021) Are you getting it? Integrating theories to explain intentions to get vaccinated against COVID-19 in Spain. J Risk Res.

47. Yang ZY (2015) Predicting young adults' intentions to get the H1N1 vaccine: An integrated model. J Health Commun 20: 69-79.

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