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Using the Health Belief Model to Understand Farmers' Intentions to Engage in the On-Farm Food Safety Practices in Iran

R. Rezaei[1]* and S. Mianaji[1]

ABSTRACT

In the present research, the health belief model was used as a framework for understanding the factors affecting farmers' intentions to engage in the on-farm food safety practices in Iran. The suggested model was empirically tested using the data collected from a survey of 230 lettuce producers of Alborz Province in northern Iran. The structural equation modeling technique was utilized to test the hypothesized relationships in the research model and confirmatory factor analysis was used to examine the validity and reliability of the measurement model. The results revealed that the perceived barrier was the most reliable predictor of the farmers' intentions to engage in the on-farm food safety practices. Further, the variables including perceived benefit, self-efficacy, and cues to action were among the main predictors of the intention. Most notably, the threat perception variables, i.e. perceived susceptibility and severity, had no significant effects on the farmers' intentions to engage in the on-farm food safety practices. Overall, the main components of the health belief model explained about 45.6% of the variance of intention. The findings gave preliminary support for the health belief model as a powerful framework for scrutinizing the intention to engage in food safety behaviors, offering a reasonable explanation for the farmers' engagement intention in on-farm food safety practices, and providing practical information that can be incorporated into the development of more effective on-farm food safety interventions in Iran.

Keywords: Alborz province, Behavioral evaluation, Structural equation modeling, Threat perception.

INTRODUCTION

In recent years, some programs and guidelines from the World Health Organization (WHO) and the Food and Agricultural Organization (FAO) have been developed in the form of On-Farm Food Safety (OFFS) practices to prevent or control conditions or factors leading to microbial contamination along the farm-to-fork continuum (Ssemanda *et al.*, 2017). In general, the OFFS practices, which typically comprise a manual of Good Agricultural Practices (GAPs) for producers (Young *et al.*, 2011), are a set of measures and standards that help assure the safe production, harvesting, and handling of fresh produce (Food and Drug Administration, 1998). In other words, they are preventive activities that the farmer takes to minimize the risk of contamination as the crop is grown, harvested, and transported to consumers (Tobin *et al.*, 2013). The OFFS practices cover a wide range of management measures, including activities related to water quality, activities specific to worker training and hygiene, controlling animal sources of contamination, use of best practices and auditing tools, implementing pest controls, and implementing proper manure protocols (Parker *et al.*, 2016). In spite of the importance of OFFS practices in contamination prevention, evidence shows that producers are uncertain about the effectiveness of food safety programs

[1]Department of Agricultural Extension, Communication and Rural Development, Faculty of Agriculture, University of Zanjan, Zanjan, Islamic Republic of Iran.
* Corresponding author; e-mail: r_rezaei@znu.ac.ir

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and hesitate to adopt new standards or practices (Parker *et al.*, 2016). Some are perceived as arbitrary or excessive (Parker *et al.*, 2012) and are inadequately carried out in the farm (Nayak *et al.*, 2015). This problem has been observed in Iran, especially in Alborz Province, which is a major lettuce production region. For example, many lettuce producers in this province use sewage and contaminated wastewater to irrigate crops and the percentage of toxic chemical substances and animal manure is high (Mianaji, 2018). Lack of attention to management practices and public health, including periodic and regular testing of the soil and water, regular cleaning of agricultural machinery, and observing health criteria during product transportation are other problems that cause reported contamination levels to be high for lettuce in Alborz Province (Rouniasi and Parvizi Mosaed, 2016).

Since the practices to improve safety of fresh and fresh-cut produce take place throughout the food chain from field to fork (Parker *et al.*, 2012), most foodborne illnesses are preventable if everyone involved, from producers to consumers, comply with food sanitation practices (Ko, 2010). On the one hand, this relies on scientific data that has been used to design the specific food safety practices; on the other, it requires that those scientists and educators involved with the social and psychological factors influencing growers' behavior reach a consensus and collective understanding (Parker *et al.*, 2012). In recent years, various theoretical frameworks and theories have been presented and applied to understand factors affecting individuals' intentions and behaviors, such as Reasoned Action/Planned Behavior, Stages of Changes, Health Action Process Approach, and Health Belief Model (HBM). Over time, the HBM has come to be the accepted conceptual model used in public health. By applying this model, it will be easier to understand why people do not like to take part in health prevention programs (Strecher and Rosenstock, 1997). Since previous studies have proven the ability of HBM to predict health behaviors satisfactorily (Janz and Becker, 1984; Hanson and Benedict, 2002), it was set as the theoretical framework of the present study. The HBM was a good option in this regard because the design of innovations should not follow a rational process only; contradictory beliefs, values, perceptions, and social interactions must also be considered (Wheeler, 2005). Moreover, the HBM proposes threat perception variables upon which health-related claims are supposed to be based (Vassallo *et al.*, 2009).

A review of the literature showed that the HBM has long been successfully used to investigate a wide variety of farmers' intentions and behaviors such as skin cancer prevention practices (Marlenga, 1995), foot and mouth disease control measures (Jemberu *et al.*, 2015), pesticide safety behavior (Bhandari *et al.*, 2018), on-farm processing license application behavior (Lubran, 2010), and adoption of recommended milking practices (Belage, 2016). Furthermore, many scholars and researchers have broadly applied the HBM to predict food safety practices (Schafer *et al.*, 1993; Hanson and Benedict, 2002; Rimal and Real, 2003; Meysenburg *et al.*, 2014). However, very few studies have looked at farmers within the HBM theoretical framework in the context of food safety behaviors. This highlights the need for further research in this field. In a similar vein, the HBM has been utilized to examine various intentions and behaviors in the context of agriculture and rural development in Iran. Such cases include the willingness to eat organic foods (Yazdanpanah *et al.*, 2015a) and use renewable energy (Yazdanpanah *et al.*, 2015b), safe use of pesticides (Yazdanpanah *et al.*, 2016), willingness toward biofuels (Bakhtiyari *et al.*, 2017), and prevention of aflatoxin production (Yazdanpanah and Salari, 2017). However, no study to date has investigated the use of HBM in the field of OFFS behaviors. Furthermore, a review of the existing scientific literature regarding food safety in Iran indicated that most studies have examined the technical aspects of agricultural production contamination and foodborne illness (Jalalpour, 2011; Masoumi Asl *et al.*, 2015; Asadpour *et al.*, 2016; Fallah *et al.*, 2016). Indeed, very few empirical studies have looked at the behavioral, psychological, and social aspects of food safety in Iran; more specifically, the majority of them have focused on consumers (Cheraghi *et al.*, 2014; Talaei *et al.*, 2015). To the best of the authors' knowledge, no research has investigated the OFFS behaviors of Iranian farmers based on a vigorous theoretical foundation and using HBM.

Therefore, there is a serious gap in the research in this field. In order to fill this gap, the current study aimed to show how well the HBM can predict farmers' intentions to engage in the OFFS practices and to understand which components of the model are the best predictors of food safety-related behaviors. Another important objective of this study was to show the feasibility of applying a health psychology model to predict OFFS practices and determine the efficiency of the HBM as a predicting model.

MATERIALS AND METHODS

Theoretical Framework and Development of Research Hypothesis

As one of the first models, the HBM was presented in the 1950s by the US public health (Rosenstock, 1974) and developed for the prediction of individual response to the preventative health services, such as screening (Janz and Becker, 1984; Rosenstock, 1974). The HBM assumes that an individual's likelihood of engaging in a health-related decision and behavior is explained by the two major components (Orji *et al.*, 2012). The components are broadly categorized into four psychosocial sub-components: perceived susceptibility, perceived severity/seriousness, perceived benefit, and perceived barrier (Abraham and Sheeran, 2005; Simsekoglu and Lajunen, 2008; Yazdanpanah *et al.*, 2015a). Despite general usefulness of the HBM to understand and predict different behaviors with health outcomes and its high adoption by the researchers of healthy behavior promotion (Orji *et al.*, 2012), the determinants of the HBM have been shown in the previous research to be insufficient for predicting behavior (Norman and Brain, 2005). The results of most quantitative reviews of the HBM were indicative of the significance of the original components (susceptibility, severity, benefit, and barrier) in the prediction of health-related behaviors. Nevertheless, they usually have very small effect sizes (Harrison *et al.*, 1992; Abraham and Sheeran, 2005; Orji *et al.*, 2012). Actually, there are some other underlying determining variables of healthy behavior not considered by the HBM (Orji *et al.*, 2012). Accordingly, throughout the decades, the original HBM has been revised and extended with the addition of different variables in order to increase its predictive power. Becker and Rosenstock (1987) and Rosenstock *et al.* (1988) added the two important variables of cues to action and self-efficacy. The inclusion of these variables generally enhanced the predictive power of the HBM. Therefore, based on the extended HBM, it can be said that the intention to perform a particular activity is a function of the beliefs of perceived susceptibility, perceived severity, perceived benefit, perceived barrier, perceived self-efficacy, and cues to action (Rosenstock, 1974; Lubran, 2010; Orji *et al.*, 2012).

Regarding the components of the HBM, perceived susceptibility is the probability of personal vulnerability assigned by an individual that affects his/her development of a health condition. In other words, it is a person's subjective belief about his/her probable involvement in a harmful condition like diseases if indulging in a particular behavior (Rosenstock, 1966). Perceived severity is defined as an individual's belief about the degree of seriousness of the outcomes of health development. It is a person's subjective belief of the harm extent he/she may be involved in if taking a particular behavior (Orji *et al.*, 2012). Perceived benefit is described as an individual's assessment of the effectiveness of engaging in a health-promoting behavior to reduce the risk of disease (Janz and Becker, 1984). If an individual believes that a particular action will decrease susceptibility to an undesirable condition, then, he/she is likely to engage in that behavior (Rosenstock, 1974). Perceived barrier is related to an individual's assessment of the obstacles he/she may be involved in due to taking the target behavior (Rosenstock, 1966). Even if an individual perceives a health condition as threatening and believes that a particular action will effectively decrease the threat, barriers may prevent involvement in the health-promoting behavior. In other words, the perceived benefits must outweigh the perceived barriers in order for behavior change to occur (Janz and Becker, 1984).

Cues to action refer to some triggers like social influence, health education campaigns for promoting healthy behaviors (Simsekoglu and

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Lajunen, 2008), and factors that activate 'readiness to change' (Belage, 2016).

Finally, perceived self-efficacy originates from Social Cognitive Theory (SCT) and refers to an individual's degree of ease or difficulty of a performance (Bandura, 1977). Generally, self-efficacious people consider potential risks as challenges to be coped with, while the non-efficacious people usually perceive their vulnerability as inevitable (Rimal and Real, 2003).

Based on the above discussion, the theoretical research framework and hypothesized relationships are shown in Figure 1. As shown, farmers' intentions to engage in the OFFS practices are influenced by the main components of the HBM including perceived susceptibility, perceived severity, perceived benefit, perceived barrier, cues to action, and perceived self-efficacy.

The statistical population of the present study comprised all lettuce producers in Alborz Province. According to the statistics of Alborz Agriculture-Jahad Organization (2016), the total number of lettuce producers included in the survey area was 732 people (Table 1). From this statistic, the number of lettuce producers selected for the survey as the sample group was 252 farmers using the following equation (Bartlett *et al.*, 2001):

$$n = \frac{\dfrac{Z_{\frac{\alpha}{2}}^{2} pq}{d^2}}{1 + \dfrac{1}{N}\left[\dfrac{Z_{\frac{\alpha}{2}}^{2} pq}{d^2} - 1\right]}$$

Where, n= Sample size, N= Population size (in this case N= 732 farmers), p= Estimated proportion of the population (p= 0.5), q= (1−p) (i.e., q= 0.5), d= One half of the desired interval width (d= 0.05), and Z= The value of the standard normal distribution for selected confidence level which was 95% (Z= 1.96). This sample provided a 5% of mean error at 95% confidence level, which was considered as acceptable (Abdollahzadeh *et al.*, 2016). The statistical population varied among the strata/subpopulation (i.e., counties), and they had heterogeneous attributes in different counties. However, while samples within each stratum were homogeneous, the stratified random sampling method was used to assure the representativeness of the sample. To this end, based on producers' distribution (Table 1), the total number of lettuce producers in Alborz Province was divided into smaller groups (strata), and a random sample was taken from each stratum proportionate to the stratum's size (Table 1). In this case, the random number table

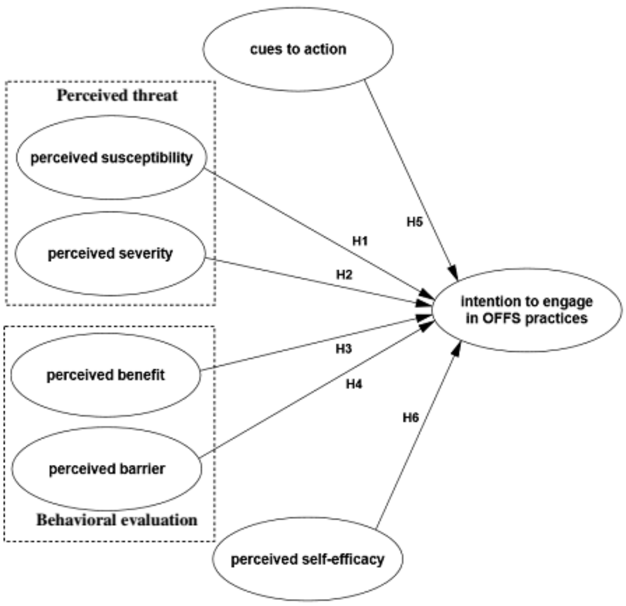

Figure 1. Theoretical research framework.

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Table 1. Characteristics of studied counties regarding the lettuce crop.

Strata (Counties)	Lettuce producers' population	Target sample[a]
Nazarabad	294	101 (92)
Fardis	20	7 (6)
Savojbolagh	308	106 (97)
Karaj	110	38 (35)
Total	732	252 (230)

[a] The values shown in parentheses of the last column are the number of questionnaires used for analysis.

was used to ensure an acceptable level of randomness, so that every member of the population had an equal chance of being drawn. It is also worth noting that the questionnaires with missing information were excluded from the study. In more detail, from 252 collected questionnaires, 22 were dropped and, therefore, a total of 230 questionnaires were considered for analysis (Table 1).

Data were collected through a structured questionnaire. Table (2) presents a list of measurement items and their sources of each part separately. Respondents were asked to specify their opinion on each item, using a five-point Likert-type scale from 1 to 5 as follows: 1= Strongly disagree; 2= Disagree; 3= Moderate 4= Agree; and 5= Strongly agree. Face validity and construct validity were used to examine the validity of the questionnaire. The face validity was examined and confirmed through comments given by faculty members and experts. Regarding the construct validity, the convergent validity was examined via three different criteria—standardized factor loadings equal to or greater than 0.5, Average Variance Extracted (AVE) equal to or larger than 0.5, and Composite Reliability (CR) equal to or greater than 0.7 (Hair *et al.*, 2010). Moreover, in order to test the discriminant validity based on the approach suggested by Fornell and Larcker (1981), the value of the square root of the *AVE* of each latent variable needs to be greater than the correlation of that variable with other latent variables. In addition to the validity of the instrument, *CR* was used to assess the reliability of the research model, whose value for each latent variable must be greater than 0.7 (Hair *et al.*, 2010). Finally, Cronbach's alpha was also used to measure the internal consistency of the measurement items. Generally, the coefficient alpha of higher than 0.7 indicates a high reliability (Hair *et al.*, 1998). Regarding the fit of the models, the following indices were used in this research: (1) The Chi-square test statistic was the most fundamental measure of the overall fit (Gerbing and Anderson, 1992). Since the Chi-square test is sensitive to sample size, the model would be assumed to demonstrate a reasonable fit if the statistic adjusted by its degrees of freedom (that is, the relative Chi-square) did not exceed 5.0 (Marsh and Hau, 1996); (2) The Root Mean square Residual (RMR) and the Root Mean Square Error of Approximation (RMSEA), in which a value less than 0.08 means that it is within the acceptable level (Marcoulides and Schumacker, 1996; Chen, 2016); (3) The Comparative Fit Index (CFI), Incremental Fit Index (IFI), Goodness-of-Fit Index (GFI), and Adjusted GFI (AGFI). Where, the values higher than 0.90 are considered as acceptable fit (Bagozzi and Yi, 1988).

Structural Equation Modeling (SEM), using maximum likelihood procedure with Analysis of Moment Structures (AMOS) software version 20.0, was adopted to analyze the data and the proposed hypotheses of this research (Hair *et al.*, 2014). Based on Anderson and Gerbing's (1988) two-stage model building process, the first step is to conduct the research measurement model (first-order Confirmatory Factor Analysis/CFA) to assess the fit of the research model and examine the construct validity and reliability of the model. In the second step, the hypothesized structural relationship among constructs is estimated based on the structural model. To this end, the data of the survey variables obtained from the CFA were used as a database for the relationship analysis after confirming the adequacy of the measurement models.

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RESULTS

Measurement Models

The results of first-order CFA revealed that the factor loading values for all observed variables were greater than 0.7 and, so, were significant, except for one variable of Susceptibility$_4$ which had lower factor loading value of 0.23 (Table 2). Therefore, this variable was dropped from the measurement model, which was then retested. In addition, with regard to the *AVE* and *CR* values of each latent variable evaluated in this research, the values of all variables were higher than 0.5 and 0.7, respectively (Table 2). Thus, convergent validity and *CR* of the research model were evident. The results showed that the Cronbach's alpha values fell in the range of 0.771–0.875, all of which were greater than 0.7 (Table 2), indicating that the measurements exhibited adequate internal consistency reliability. As indicated in Table 2, various fit indices ranged from very good to excellent, whereas the full measurement model displayed a good overall fit of the data.

Table 3 presents the results regarding discriminant validity, with the square root of the *AVE* represented by the diagonal. In all cases, as can be seen by the information shown in Table 3, the Fornell and Larcker's (1981) test is met for all pairs of latent variables. That is, there was discriminant validity; the latent variables were distinctly different from each other.

Structural Model

The results of structural model revealed that although the estimated model based on the Chi-square significant indicator lacked a good fitness, the model had an acceptable fitness based on other criteria (Figure 2). Moreover, the Squared Multiple Correlations (SMC; R^2) for the intention to engage in the OFFS practices was 45.6%. This implied that the components of the HBM could explain a 45.6% variance of the intention (Figure 2).

According to the results shown in Table 4, perceived benefit (β= 0.288, Sig= 0.001), perceived barriers (β= -0.313, Sig= 0.001), Cues to action (β= 0.138, Sig= 0.047), and perceived self-efficacy (β= 0.148, Sig= 0.028) had statistically significant effects on the variable of intention to engage in the OFFS practices. Thus, H_3, H_4, H_5, and H_6 were supported (Table 4). However, the standardized path coefficients of the perceived susceptibility (β= 0.097, Sig= 0.407) and perceived severity (β= 0.075, Sig= 0.480) were not statistically significant for the intention. Thus, H_1 and H_2 were not supported (Table 4).

DISCUSSION

The results of the research revealed that hypotheses 1 and 2 were not supported and the variables of threat perception (perceived susceptibility and severity) had no significant effects on the farmers' intentions to engage in the OFFS practices. This finding is not consistent with the results of Schafer *et al.* (1993), Clayton *et al.* (2002), and Orji *et al.* (2012), but it is in agreement with the results of Hanson and Benedict (2002), Simsekoglu and Lajunen (2008), Vassallo *et al.* (2009), and Lubran (2010). However, since OFFS practices are considered as preventive behaviors, the mentioned variables, particularly susceptibility, were expected to have statistically significant effects on farmers' intentions to engage in those practices. One possible explanation for this was that the farmers might not have been thinking about the probable risk factors of diseases when making their OFFS decisions. In other words, the farmers who did not intend to engage in the OFFS practices perceived a low risk of someone contracting a foodborne illness in their business (Clayton *et al.*, 2002). Similarly, Carpenter (2010) stated that people would not act to prevent a negative health outcome that is unlikely to afflict them. Food safety risks are frequently perceived with an optimistic bias for bearing no threat (Redmond and Griffith, 2005; Riggins, 2006). People usually presume that risks and educational warnings are only for others (Redmond and Griffith, 2005; Riggins, 2006). As highlighted by Weinstein (1987), an optimistic bias is most likely related to the belief that a problem will be unlikely to happen in the future if it has not yet occurred. Further, another reason for the mentioned finding could be the indirect effects of severity and susceptibility on

Table 2. Constructs, measurement items, and reliability and validity tests.

Constructs and items	Item loading	*t*-Value
Measurement model 1: Intention to engage in the OFFS practices (Armitage and Conner, 1999; Ajzen, 2002): *CR*= 0.833, *AVE*= 0.565; Cronbach's Alpha= 0.809		
I intend to engage in OFFS practices in the future ($Intention_1$).	0.91	fixed
I plan to engage in OFFS practices in the future ($Intention_2$).	0.85	15.809
I want to engage in OFFS practices in the future ($Intention_3$).	0.63	10.437
I strongly recommend that other producers engage in OFFS practices ($Intention_4$).	0.56	9.105
Measurement model 2: Perceived susceptibility (Byrd-Bredbenner *et al.*, 2007; Lubran, 2010): *CR*= 0.796, *AVE*= 0.568; Cronbach's Alpha= 0.771		
In my opinion, many diseases are currently due to non-compliance with OFFS practices and contamination in agricultural food products ($Susceptibility_1$).	0.65	fixed
The issues related to food safety, particularly foodborne diseases, are serious concerns for me ($Susceptibility_2$).	0.77	9.298
I am confident that the product I produce in my farm is healthy and non-contaminated ($Susceptibility_3$).	0.83	9.710
The product I produce in my farm is healthier and safer than those produced by other farmers ($Susceptibility_4$).	Dropped	-
Measurement model 3: Perceived severity (Hanson and Benedict, 2002; Lubran, 2010): *CR*= 0.898, *AVE*= 0.747; Cronbach's Alpha= 0.875		
I believe that foodborne diseases are very dangerous and can seriously put consumers' health at risk ($Severity_1$).	0.81	fixed
There is little chance that the product I produce in my farm causes a disease in my family and other consumers ($Severity_2$).	0.91	15.625
I believe that lack of attention to OFFS and production of healthy products can significantly damage my business ($Severity_3$).	0.87	15.045
Measurement model 4: Perceived benefit (Ivey *et al.*, 2012; Nayak *et al.*, 2015): *CR*= 0.858, *AVE*= 0.668; Cronbach's Alpha= 0.824		
In my opinion, engaging in OFFS practices can lead to an increase in my farm production ($Benefit_1$).	0.79	fixed
I believe that engaging in OFFS practices and producing healthy products would allow me to sell more products at farmers' markets ($Benefit_2$).	0.87	13.212
In my opinion, engaging in OFFS practices can improve my nutrition and health status and those of other people in the society as well ($Benefit_3$).	0.79	12.214
Measurement model 5: Perceived barrier (Lubran, 2010; Parker *et al.*, 2016): *CR*= 0.881, *AVE*= 0.650; Cronbach's Alpha= 0.867		
Engaging in OFFS practices is time-consuming for me ($Barrier_1$).	0.82	fixed
In my opinion, engaging in OFFS practices would increase the production cost ($Barrier_2$).	0.87	14.797
Engaging in OFFS practices requires health systems and facilities, to which I do not have sufficient accessibility in my farm ($Barrier_3$).	0.76	12.582
There are few valid educational and information channels and resources for learning the needed skills and knowledge and engaging in OFFS practices ($Barrier_4$).	0.77	12.786
Measurement model 6: Cues to action (Hanson and Benedict, 2002; Vassallo *et al.*, 2009; Lubran, 2010): *CR*= 0.884, *AVE*= 0.657; Cronbach's Alpha= 0.859		
I can hear television or radio news stories about foodborne diseases (Cue to $action_1$).	0.71	fixed
I read the 'safe food-handling instructions' on the packages of inputs, particularly chemical fertilizers and pesticides (Cue to $action_2$).	0.90	12.449
I receive the necessary information about food safety from the experts and extension agents (Cue to $action_3$).	0.84	11.812
I participate in the food safety training courses (Cue to $action_4$).	0.78	10.979
Measurement model 7: Perceived self-efficacy (Ajzen, 2002; Clayton and Griffith, 2008): *CR*= 0.815, *AVE*= 0.597; Cronbach's Alpha= 0.776		
The use of OFFS practices is easy, and I can easily engage in them in my farm ($Self\text{-}efficacy_1$).	0.85	fixed
I have enough awareness and information about OFFS practices, and I do not need any training in this respect ($Self\text{-}efficacy_2$).	0.77	10.445
I am confident in my abilities and skills to perform OFFS practices, and produce safe food ($Self\text{-}efficacy_3$).	0.69	9.770

Fit indices of the full measurement model: *Chi*-square (df)= 513.613 (231); *P*-value= 0.000; Relative *Chi*-square= 2.223; *AGFI*= 0.791; *GFI*= 0.839; *CFI*= 0.911; *IFI*= 0.913; *RMSEA*= 0.073; *RMR*= 0.048.

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Table 3. Discriminant validity matrix.[a]

Latent variable	1	2	3	4	5	6	7
1. Intention	0.752						
2. Perceived susceptibility	0.359	0.754					
3. Perceived severity	0.267	0.750	0.864				
4. Perceived benefit	0.565	0.362	0.337	0.817			
5. Perceived barrier	-0.567	-0.472	-0.366	-0.524	0.806		
6. Cues to action	0.399	0.331	0.320	.0373	-0.437	0.811	
7. Perceived self-efficacy	0.316	0.139	0.185	0.349	-0.166	0.159	0.773

[a] The figures corresponding to square root of *AVE* for each column latent variable is captured in bold along the diagonal. Other figures are the correlation between two latent variables.

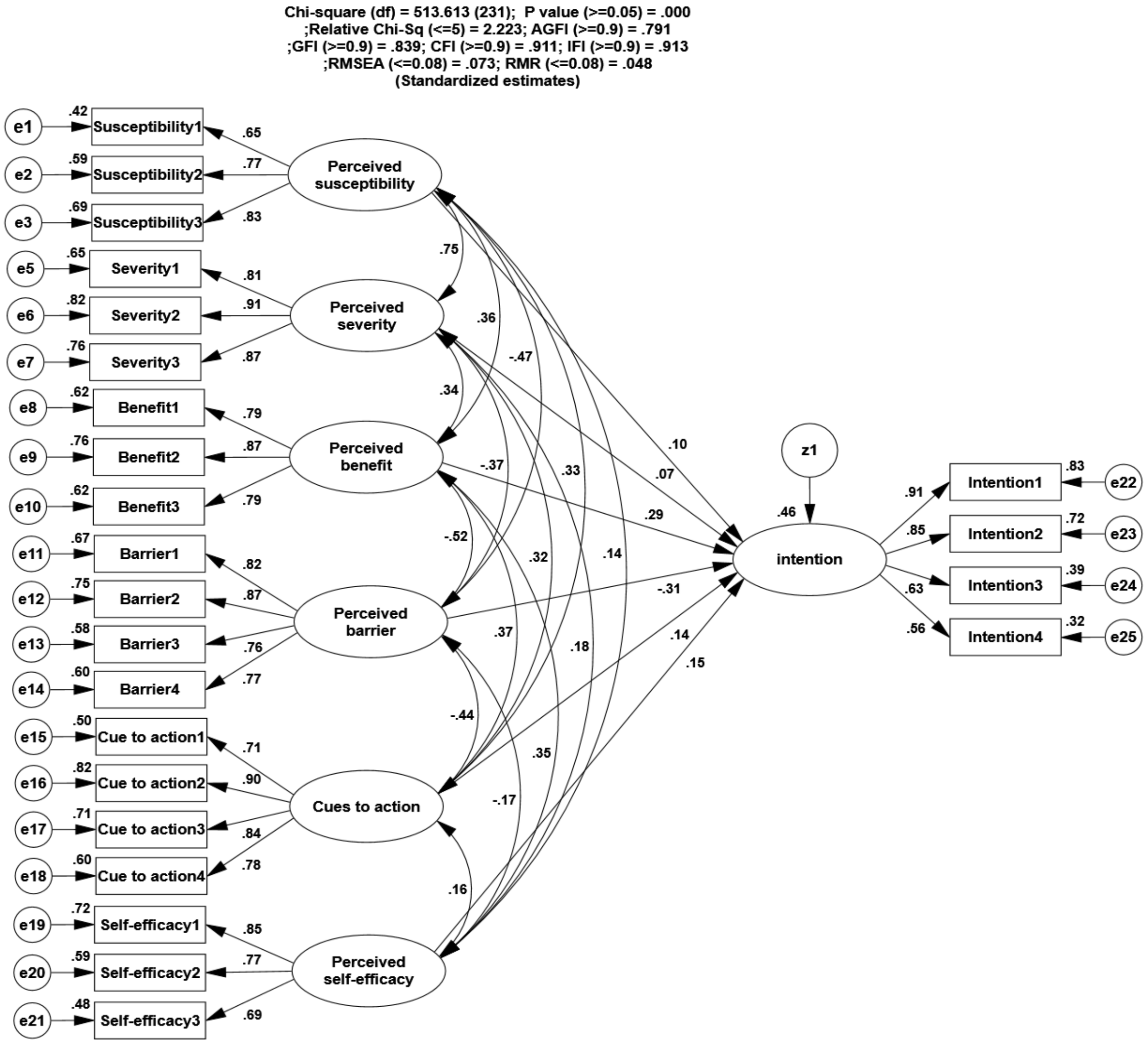

Figure 2. Structural equation modeling and standardized path coefficients.

Table 4. The results of estimating the structural model.

Path and hypotheses	Unstandardized estimates	*SE*	Standardized estimates	Critical Ratio	*Sig*	Result
Perceived susceptibility→Intention (H_1)	0.142	0.171	0.097	0.829	0.407	Not supported
Perceived severity→Intention (H_2)	0.084	0.119	0.075	0.707	0.480	Not supported
Perceived benefit→ Intention (H_3)	0.346	0.099	0.288	3.496	0.001	Supported
Perceived barrier→ Intention (H_4)	-0.427	0.113	-0.313	-3.762	0.001	Supported
Cues to action→ Intention (H_5)	0.195	0.098	0.138	1.988	0.047	Supported
Perceived self-efficacy→ Intention (H_6)	0.125	0.057	0.148	2.201	0.028	Supported

intention since their relationships are mediated by perceived threat (Janz and Becker, 1984). The results revealed that the variable of perceived benefit as one of the main components of the HBM had a positive and significant effect on the farmers' intentions to engage in the OFFS practices, thus supporting hypothesis 3. This finding is consistent with the results of Riggins (2006); Vassallo *et al.* (2009); Carpenter (2010); and Orji *et al.* (2012). The result can be explained by the fact that the farmers intended to engage in the OFFS practices since they perceived them to be effective both for them and the society. In fact, such benefits are the incentives that can facilitate the process of changing farmers' behaviors and give them more motivations to engage in the OFFS practices. Therefore, people would adopt new healthy behaviors, such as OFFS practices, only when they believe in their greater benefits than those of the old ones (Center for Disease Control and Prevention, 2004).

As congruent with the previous research (i.e., Clayton *et al.*, 2002; Riggins, 2006; Simsekoglu and Lajunen, 2008; Vassallo *et al.*, 2009; Carpenter, 2010; Belage, 2016), another main component of the HBM that had a negative and significant effect on the farmers' intentions to engage in the OFFS practices was perceived barrier, thus supporting hypothesis 4. Rosenstock (1966) believed that people would be unlikely to adopt a preventative behavior if they perceive strong barriers in front of them. According to this, farmers who perceive more barriers when deciding to engage in the OFFS practices show significantly less intention to use those practices. Based on the results of various studies, there are different barriers to the successful implementation of OFFS practices. The most important barriers are knowledge, attitude, and behavior (Lubran, 2010). Most of the barriers included in the research model were behavioral barriers in a way that the majority of the farmers emphasized that engaging in the OFFS practices was time-consuming for them and most of them did not have sufficient accessibility to the required health systems and facilities in their farms. Another main behavioral barrier was the high cost of engaging in the OFFS practices. Therefore, considering that most of the farmers in Alborz Province are small to medium holder farmers, policy interventions should target the processes of barrier reduction and the government should provide the necessary support, especially through financial credits, to help the farmers equip their farms. In addition, the farmers stated that learning the needed skills and knowledge to engage in the OFFS practices was difficult for them and they did not have enough accessibility to valid educational and information channels and resources. Thus, it is essential to provide them with the necessary skills and information in a simple and clear manner.

The results indicated that the variable of cues to action had a positive and significant effect on the farmers' intentions to engage in the OFFS practices, thus supporting hypothesis 5. This finding is consistent with the results of Hanson and Benedict (2002), Lubran (2010), and Orji *et al.* (2012), but it is not in line with those of Vassallo *et al.* (2009) and Yazdanpanah *et al.* (2015a). In general, a person will more probably react to different cues to action based on a particular behavior when confronting a health message that induces him/her to perform that specified health behavior. He/she may find more benefits of the target behavior than the barriers to it. Furthermore, he/she can have an enhanced assessment of the perceived threat of an unhealthy behavior, which will make him/her increasingly adopt healthy behaviors (Orji *et al.*, 2012). Accordingly, farmers' intentions to engage in the OFFS practices will increase if they receive certain cues to action. There are various cues such as holding meetings and educational extension courses, and offering extension brochures and bulletins, posters, and videos, all of which should be provided for producers to increase the effect of cues to action (Lubran, 2010). Not enough attention has been paid to this issue in Alborz Province. Based on the results, hypothesis 6 was supported, i.e. the variable of self-efficacy had a significant and positive effect on the farmers' intentions to engage in the OFFS practices. This finding is in agreement with the results of Schafer *et al.* (1993), Lubran (2010), Orji *et al.* (2012), and Yazdanpanah *et al.* (2015a). In this case, Schafer *et al.* (1993) believed that people who have high self-efficacy do not respond to a food safety threat by ignoring it or fatalistically accepting the danger. Instead, they respond to the peril of unsafe food by engaging in specific food safety behaviors. Importantly, Byrd-Bredbenner *et al.* (2007) highlighted that perceived self-efficacy affects the initiation of health behavior, preparation for change, amount of an extended effort, and durability of the behavior. In addition, the findings obtained by Orji *et al.* (2012) were indicative of the reduced negative effect of barrier on healthy behavior by self-efficacy. This implies the possibility of decreasing the hindering impact of barrier on the adoption of healthy behavior by increasing the feeling of self-efficacy via varied strategies of technological interventions like role-playing, goal setting, and modeling.

CONCLUSIONS

The primary objective of the study was to explore which of the HBM components are the best determinants of farmers' intentions to engage in food safety behaviors. The findings indicated that the HBM components varied in their effectiveness as predictors of farmers' intentions. In this regard, the variable of perceived barrier was the most reliable predictor of the farmers' intentions to engage in the OFFS practices. Further, the variables of perceived benefit, self-efficacy, and cues to action were among the main predictors of the intention. Most notably, two variables of perceived susceptibility and severity did not have statistically significant relationships with the variable of intention to engage in the OFFS practices. This implies that the behavioral evaluation variables prevailed strongly in explaining intention to engage in the OFFS practices in comparison with the threat perception variables. In respect to the second objective of the study which focused on investigating the efficiency of the HBM in predicting and explaining farmers' intentions to engage in the OFFS practices, the results of this study also suggested that the components of the HBM explained about 45.6% of the variance of intention. However, past quantitative research reviews and meta-analyses undertaken on using the HBM have shown that, on average, the main variables of the model predicted approximately 20% of the variance in healthy behavior. Given the amount of explained variance in the current study, the HBM has an appropriate predictive power and it is a valid and efficient model in predicting behaviors in the context of the OFFS.

Finally, a number of important limitations need to be considered. First, this study has focused specifically on the lettuce producers of Alborz Province in northern Iran, so, the results obtained here may not be entirely generalizable to the nation. Thus, future studies should involve more participants of different crops in different provinces. Second, the HBM explained 45.6% of the variance of intention to engage in the OFFS practices, which suggests that other variables such as general beliefs (Bakhtiyari *et al.*, 2017), health motivation (Shcafer *et al.*, 1993), self-identity, perceived importance (Orji *et al.*, 2012), and health value (Simsekoglu and Lajunen, 2008), may affect farmers' intentions. These other variables could be included in the proposed model in this study to enhance its predictive power. Furthermore, socio-demographic factors were not considered in this study, although the results of some studies indicate that such factors played a potential role in determining farmers' food safety behaviors (Al-Sakkaf, 2015). Accordingly, future research may also examine how socio-demographic variables affect farmers' intentions to engage in the OFFS practices. Third, although intention is a good predictor of behavior, it is distinct from behavior and cannot entirely represent actual behavior (Zhang *et al.*,

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2017). Therefore, further research should examine the actual OFFS behavior of farmers. Fourth, this study relied on the self-reports of individual perception. This might be considered as an inherent limitation of the study because people are likely to over-report their intentions due to social desirability (Damalas and Abdollahzadeh, 2016; Zhang *et al.*, 2017). Thus, the results of the study should be interpreted with caution.

REFERENCES

1. Abdollahzadeh, G., Sharifzadeh, M. S. and Damalas, C. A. 2016. Motivations for Adopting Biological Control among Iranian Rice Farmers. *Crop Prot*., **80**: 42-50.
2. Abraham, C. and Sheeran, P. 2005. The Health Belief Model. In: "*Predicting Health Behavior: Research and Practice with Social Cognition Models*", (Eds.): Conner, M. and Norman, P. 2nd Edition, Open University Press, Maidenhead, PP. 28-80.
3. Ajzen, I. 2002. Perceived Behavioral Control, Self-Efficacy, Locus of Control, and the Theory of Planned Behavior. *J. Appl. Soc. Psychol.,* **32(4)**: 665-683.
4. Alborz Agriculture-Jahad Organization. 2016. *A Review on the Situation of on-Farm Food Safety in Province of Alborz.* Research Report, Alborz Agriculture-Jahad Organization, Iran.
5. Al-Sakkaf, A. 2015. Domestic Food Preparation Practices: A Review of the Reasons for Poor Home Hygiene Practices. *Health Promot. Int.*, **30(3)**: 27-37.
6. Anderson J. and Gerbing D. 1988. Structural Equation Modeling in Practice: A Review and Recommended Two-Step Approach. *Psychol. Bull.,* **103(3)**: 411-423.
7. Armitage, C. and Conner, M. 1999. The Theory of Planned Behavior: Assessment of Predictive Validity and Perceived Control. *Brit. J. Soc. Psychol.,* **38**: 35-54.
8. Asadpour, M., Malekpour, H., Jafari, A. and Bahrami, S. 2016. Diversity of Parasitic Contamination in Raw Vegetables Commonly Consumed in Shiraz, Southwest of Iran. *Asian Pacific J. Trop. Dis.,* **6(2)**: 160-162.
9. Bagozzi, R. P. and Yi, Y. 1988. On the Evaluation of Structural Equation Models. *J. Acad. Market. Sci.*, 16: 74-94.
10. Bakhtiyari, Z., Yazdanpanah, M., Forouzani, M. and Kazemi, N. 2017. Intention of Agricultural Professionals toward Biofuels in Iran: Implications for Energy Security, Society, and Policy. *J. Renew. Sustain. Ener*., **69**: 341-349.
11. Bandura, A. 1977. Self-Efficacy: Toward a Unifying Theory of Behavioral Change. *Psychol. Rev.*, **84**: 191-215.
12. Bartlett J., Kotrlik J. and Higgins C. 2001. Organizational Research: Determining Appropriation Sample Size in Survey Research. *Inf. Technol. Learn. Perform. J.,* **19(1)**: 43-50.
13. Becker, M. and Rosenstock, I. 1987. Comparing Social Learning Theory and the Health Belief Model. *Adv. Health Educ. Promot.*, **2**: 245-249.
14. Belage, E. 2016. Impediments to Adoption of Recommended Milking Practices by Canadian Dairy Farmers. MSc. Thesis, The University of Guelph, Ontario, Canada.
15. Bhandari, G., Atreya, K., Yang, X., Fan, X. and Geissen, V. 2018. Factors Affecting Pesticide Safety Behavior: The Perceptions of Nepalese Farmers and Retailers. *Sci. Total Environ.*, **631-632**: 1560-1571.
16. Byrd-Bredbenner, C., Wheatley, V., Schaffner, D., Bruhn, C., Blalock, L. and Maurer, J. 2007. Development and Implementation of a Food Safety Knowledge Instrument. *J. Food Sci. Educ.,* **6**: 46-55.
17. Carpenter, C. 2010. A Meta-Analysis of the Effectiveness of Health Belief Model Variables in Predicting Behavior. *Health Commun.,* **25**: 661-669.
18. Center for Disease Control and Prevention. 2004. *Program Operations Guidelines for STD Prevention: Community and Individual Behavior Change Interventions.* Retrieved Dec. 2010 from http://www.cdc.gov/std/program/community
19. Chen, M. F. 2016. Extending the Theory of Planned Behavior Model to Explain People's Energy Savings and Carbon Reduction Behavioral Intentions to Mitigate Climate Change in Taiwan-Moral Obligation Matters. *J. Clean. Prod.*, **112**: 1746-1753.
20. Cheraghi, Z., Okhovat, B., Doosti Irani, A., Talaei, M., Ahmadnezhad, E., Gooya, M., Soroush, M., Masoumi Asl, H. and Holakouie-Naieni, K. 2014. Knowledge, Attitude, and Practice Regarding Food, and Waterborne Outbreak after Massive Diarrhea Outbreak in Yazd Province, Iran, Summer 2013. *Int. Sch. Res. Notices*, **1**: 7-14.

[DOR: 20.1001.1.16807073.2019.21.3.10.3]

21. Clayton, D. and Griffith, C. 2008. Efficacy of an Extended Theory of Planned Behavior Model for Predicting Caterers' Hand Hygiene Practices. *Int. J. Environ. Health Res.,* **18**: 83-98.
22. Clayton, D., Griffith, C., Price, P. and Peters, A. 2002. Food Handlers' Beliefs and Self-Reported Practices. *Int. J. Environ. Health Res.*, **12**: 25-39.
23. Damalas, C.A. and Abdollahzadeh, G. 2016. Farmers' Use of Personal Protective Equipment during Handling of Plant Protection Products: Determinants of Implementation. *Sci. Total Environ.*, **571**: 730-736.
24. Fallah, A., Makhtumi Y. and Pirali-Kheirabadi, K. 2016. Seasonal Study of Parasitic Contamination in Fresh Salad Vegetables Marketed in Shahrekord, Iran. *Food Control*, **60**: 538-542.
25. Food and Drug Administration. 1998. Guidance for Industry: Guide to Minimize Microbial Food Safety Hazards for Fresh Fruits and Vegetables. Center for Food Safety and Applied Nutrition, Washington, DC.
26. Fornell, C. and Larcker, D. 1981. Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *J. Market. Res.*, **18(1)**: 39-50.
27. Gerbing, D. W. and Anderson, J. C. 1992. Monte Carlo Evaluations of Goodness of Fit Indices for Structural Equation Models. *Sociol. Method Res.*, **21**:132-160.
28. Hair, J., Black, C., Babin, J. and Anderson, E. 2010. *Multivariate Data Analysis.* Prentice Hall Publisher, USA.
29. Hair, J. F., Anderson, R. E. and Tatham, R. L. 1998. Multivariate Data Analysis. Pearson, New York, USA.
30. Hair, J. F., Gabriel, M. L. D. S., and Patel V. K. 2014. AMOS Covariance-Based Structural Equation Modeling (CB-SEM): Guidelines on Its Application as a Marketing Research Tool. *Braz. J. Market.*, **13(2)**: 44-55.
31. Hanson, J. and Benedict, J. 2002. Use of the Health Belief Model to Examine Older Adults' Food-Handling Behaviors. *J. Nutr. Educ. Behav.*, **34**: 25-30.
32. Harrison, J., Mullen, P. and Green, L. 1992. A Meta-Analysis of Studies of the Health Belief Model with Adults. *Health Educ. Res.*, **7**: 107-116.
33. Ivey, M., LeJeune, J. and Miller, S. 2012. Vegetable Producers' Perceptions of Food Safety Hazards in the Midwestern USA. *Food Control*, **26**: 453-465.
34. Jalalpour, S. 2011. Food Borne Diseases Bacteria; Frequency Antibiotic Resistance Bacteria in Iranian Foods. *Afr. J. Microbiol. Res.*, **6(4)**: 719-723.
35. Janz, N. K. and Becker, M. H. 1984. The Health Belief Model: A Decade Later. *Health Educ. Q.*, **11**: 1-47.
36. Jemberu, W. T., Mourits, M. C. M. and Hogeveen, H. 2015. Farmers' Intentions to Implement Foot and Mouth Disease Control Measures in Ethiopia. *PLOS One*, **10(9)**: 1-15.
37. Ko, W. H. 2010. Evaluating Food Safety Perceptions and Practices for Agricultural Food Handler. *Food Control*, **21(4)**: 450-455.
38. Lubran, M. 2010. Factors Influencing Maryland Farmers' on-Farm Processing License Application Behavior. PhD. Thesis, Faculty of the Graduate School of the University of Maryland, College Park.
39. Marcoulides, G. A. and Schumacker, R. E. 1996. *Advanced Structural Equation Modeling: Issues and Techniques*. First Edition, New York, USA.
40. Marlenga, B. 1995. The Health Beliefs and Skin Cancer Prevention Practices of Wisconsin Dairy Farmers. *Oncol. Nurs. Forum*, **22(4)**: 681-686.
41. Marsh, H. W. and Hau, K. T. 1996. Assessing Goodness of Fit: Is Parsimony Always Desirable? *J. Exp. Edu.*, **64(4)**: 364-390.
42. Masoumi Asl, H., Gouya, M., Soltan-dallal, M. and Aghili, N. 2015. Surveillance for Foodborne Disease Outbreaks in Iran, 2006-2011. *Med. J. Islam Repub. Iran*, **3(29)**: 285-290.
43. Meysenburg, R., Albrecht, J., Litchfield, R. and Ritter-Gooder, P. 2014. Food Safety Knowledge, Practices and Beliefs of Primary Food Preparers in Families with Young Children: A Mixed Methods Study. *Appetite*, **73**: 121-131.
44. Mianaji, S. 2018. Factors Affecting Implementation of on-Farm Food Safety Practices among Lettuce Producers in Alborz Province, Iran. Unpublished MSc. Dissertation, University of Zanjan, Zanjan, Iran.
45. Nayak, R., Tobin, D., Thomson, J., Radhakrishna, R. and LaBorde, L. 2015. Evaluation of on-Farm Food Safety Programming in Pennsylvania: Implications for Extension. *J. Ext.*, **53(1)**: 1-9.

[DOR: 20.1001.1.16807073.2019.21.3.10.3]

46. Norman, P. and Brain, K. 2005. An Application of the Health Belief Model to the Prediction of Breast Self-Examination in a National Sample of Women with a Family History of Breast Cancer. *Brit. J. Health Psychol.,* **10(1)**: 1-16.
47. Orji, R., Vassileva, J. and Mandryk, R. 2012. Towards an Effective Health Interventions Design: An Extension of the Health Belief Model. *Pub. Health Inf.,* **4(3)**: 1-31.
48. Parker, J., DeNiro, J., Ivey, M. and Doohan, D. 2016. Are Small and Medium Scale Produce Farms Inherent Food Safety Risks? *J. Rural Stud.,* **44**: 250-260.
49. Parker, J., Wilson, R., LeJeune, J., Rivers, L. and Doohan, D. 2012. An Expert Guide to Understanding Grower Decisions Related to Fresh Fruit and Vegetable Contamination and Control. *Food Control,* **26(1)**: 107-116.
50. Redmond, E. and Griffith, C. 2005. Factors Influencing the Efficacy of Consumer Food Safety Education. *Brit. Food J.,* **107**: 484-499.
51. Riggins, L. 2006. *Beliefs and Perceptions about HACCP in Childcare Centers: An Exploratory Study*. Research Report, Kansas State University.
52. Rimal, R. and Real, K. 2003. Perceived Risk and Efficacy Beliefs as Motivators of Cchange. Use of the Risk Perception Attitude (RPA) Framework to Understand Health Behaviors. *Hum. Commun. Res.,* **29**: 370-390.
53. Rosenstock, I. 1966. Why People Use Health Services. *Milbank Memo. Fund*., **44**: 94-127.
54. Rosenstock, I. 1974. Historical Origins of the HBM. *Health Educ. Monogr.,* **2**: 1-8.
55. Rosenstock, I., Strecher, V. and Becker, M. 1988. Social Learning Theory and the Health Belief Model. *Health Educ. Q.,* **15(2)**: 175-183.
56. Rouniasi, N. and Parvizi Mosaed, H. 2016. Investigating the Amount of Heavy Metals in Different Parts of Some Consumable Vegetables in Karaj City. *Iran. J. Health Environ.,* **9(2)**: 171-184.
57. Schafer, R. B., Schafer, E., Bultena, G. L. and Hoiberg, E. O. 1993. Food Safety: An Application of the Health Belief Model. *J. Nutr. Educ.,* **25(1)**: 17-24.
58. Simsekoglu, O. and Lajunen, T. 2008. Social Psychology of Seat Belt Use: A Comparison of Theory of Planned Behavior and Health Belief Model. *Transport. Res.,* **11**: 181-191.
59. Ssemanda J., Reij M., Bagabe M., Muvunyi C., Joosten H. and Zwietering M. 2017. Indicator Microorganisms in Fresh Vegetables from "Farm to Fork" in Rwanda. *Food Control,* **75**: 126-133.
60. Strecher, V. and Rosenstock, I. 1997. *The Health Belief Model.* Cambridge Handbook of Psychology, Health and Medicine, USA.
61. Talaei, M., Holakouie-Naieni, K., Rahimi Foroushani, A. and Masoumi Asl, H. 2015. Knowledge, Attitude and Practice of People about Foodborne Outbreak in Isfahan City, Iran. *J. Food Saf. Hyg.,* **1(2)**: 39-45.
62. Tobin, D., Thomson, J., LaBorde, L. and Radhakrishna, R. 2013. Factors Affecting Growers' on-Farm Food Safety Practices: Evaluation Findings from Penn State Extension Programming. *Food Control,* **33**: 73-80.
63. Vassallo, M., Saba, A., Arvola, A., Dean, M., Messina, F., Winkelmann, M., Claupein, E., Lähteenmäki, L. and Shepherd, R. 2009. Willingness to Use Functional Breads. Applying the Health Belief Model across Four European Countries. *Appetite*, **52**: 452-460.
64. Weinstein, N. 1987. Unrealistic Optimisms about Susceptibility to Health Problems: Conclusions from a Community-Wide Sample. *J. Behav. Medic.,* **10**: 481-500.
65. Wheeler, S. 2005. Factors Influencing Agricultural Professionals' Attitudes towards Organic Agriculture and Biotechnology. Center for Regulation and Market Analysis, University of South Australia.
66. Yazdanpanah, M. and Salari, F. 2017. Investigating the Factors that Affect Pistachio Growers' Intention Regarding Prevention of Aflatoxin Based on the Health Belief Model in the Sirjan Rural Area. *Rural Dev. Str.,* **3(4)**: 509-524.
67. Yazdanpanah, M., Fourozani, M. and Hojjati, M. 2015a. Willingness of Iranian Young Adults to Eat Organic Foods: Application of the Health Belief Model. *Food Qual. Prefer.,* **41**: 75-83.
68. Yazdanpanah, M., Komendantova, N., Shirazi, Z. N. and Linnerooth-Bayer, J. 2015b. Green or in between? Examining Youth Perceptions of Renewable Rnergy in Iran. *Energ. Res. Soc. Sci.,* **8**: 78-85.
69. Yazdanpanah, M., Tavakoli, K. and Marzban, A. 2016. Investigating Factors Influence Farmers' Intention Regarding Safe Use of Pesticides through Health Belief Model. Iran. *Agr. Ext. Edu. J.,* **11(2)**: 21-29.
70. Young, I., Rajic, A., Dooh, L., Jones, A. Q. and McEwen, S. A. 2011. Use of Good Agricultural Practices and Attitudes toward on-

Farm Food Safety among Niche-Market Producers in Ontario, Canada: A Mixed-Methods Study. *Food Protect. Trends.* **31(6)**: 343-354.

71. Zhang, X., Geng, G. and Sun, P. 2017. Determinants and Implications of Citizens' Environmental Complaint in China: Integrating Theory of Planned Behavior and Norm Activation Model, *J. Clean. Prod.*, **166**: 148-156.

کاربرد مدل اعتقاد سلامت به منظور شناخت قصد کشاورزان برای انجام اقدامات ایمنی غذایی در مزرعه در ایران

ر. رضائی، و س. میانجی

چکیده

در پژوهش حاضر، مدل اعتقاد سلامت به عنوان چارچوبی برای درک عوامل تأثیرگذار بر قصد کشاورزان برای انجام اقدامات ایمنی غذایی در مزرعه در ایران به کار گرفته شد. مدل پیشنهاد شده به طور تجربی از طریق داده‌های پیمایشی گردآوری شده از ۲۳۰ تولیدکننده کاهو در استان البرز در شمال ایران مورد بررسی قرار گرفت. تکنیک مدل‌سازی معادله ساختاری برای آزمون روابط فرضیه‌ای در مدل پژوهش استفاده شد و تحلیل عاملی تأییدی به منظور بررسی روایی و پایایی مدل اندازه‌گیری تحقیق به کار رفت. نتایج نشان داد که موانع درک شده اصلی‌ترین متغیر پیش‌بینی کننده قصد کشاورزان برای انجام اقدامات ایمنی غذایی در مزرعه بود. افزون بر این، متغیرهای مزایای درک شده، خودکارآمدی و راهنمای اقدام، از دیگر متغیرهای پیش‌بینی کننده قصد بودند. قابل توجه‌ترین یافته این تحقیق آن بود که متغیرهای ادراک تهدید یعنی شدت درک شده و حساسیت درک شده، اثر معنی‌داری بر قصد کشاورزان برای انجام اقدامات ایمنی غذایی در مزرعه نداشتند. در مجموع، مؤلفه‌های اصلی مدل اعتقاد سلامت در حدود ۴۵/۶ درصد از واریانس قصد را تبیین کردند. یافته‌های این تحقیق، در وهله نخست از مدل اعتقاد سلامت به عنوان یک چارچوب مؤثر برای بررسی قصد انجام رفتارهای ایمنی غذایی پشتیبانی کرده و ضمن ارایه توضیحی مستدل برای قصد درگیری کشاورزان در اقدامات ایمنی غذایی در مزرعه، اطلاعات کاربردی را در راستای توسعه برنامه‌های مداخله‌ای مؤثر در زمینه اقدامات ایمنی غذایی در مزرعه در ایران فراهم می‌کند.