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Original Article

Factors Affecting Ongoing Preventive Behaviors of Sheep Farmers Against the Prevalence of Covid-19

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Abstract

Purpose: Despite much evidence on consumers' behaviors and veterinarians' perspectives against Covid-19, nor have the past inquiries surveyed ranchers and livestock breeders' hygiene behaviors against Covid-19, serving as the main actors in the supply chain of livestock-product. Therefore, this study intends to be notified of the hygiene behaviors of ranchers and sheep farmers to curtail the spread of Covid-19.

Design/Methodology/Approach: Using the theory of planned behavior and health belief model, this study contributes to predicting sheep farmers' behaviors in Maragheh County, northwestern Iran (2021-2022). Based on the quantitative paradigm and non-experimental research design, the study benefits from the cross-sectional survey to gather the data of 207 sheep farmers using questionnaire. To analyze the data, linear regression model (LRM), analysis of variance, and univariate GLM were used.

Findings: Using the Univariate General Linear Modeling (UGLM), it was found that subjective norms (SNs) ($\eta 2_{SNs} = 0.374$) and perceived behavioral control (PBC) ($\eta 2_{PBC} = 0.246$) have a significant influence on behavior, further, these factors have different variate values at three levels of production unit type, inclusive of mechanized (n = 27), semi-mechanized (n = 47), and traditional (n = 133), most value of SNs and PBC falls under the category of traditional production units. The interaction of the SNs variable (SNs × Production Unit) with the levels of the production unit is statistically significant (F = 1.87, $p < 0.05$; $\eta 2_{SNs} = 0.374$).

Original/Value: This study fulfilled the knowledge gap of the factors that contribute to forecasting hygiene behaviors of sheep farmers against Covid-19. The agenda of recommendations would have impacts on health and wellbeing of not just sheep farmers but also public people by promoting the preventive behaviors of ranchers and sheep farmers against the spread of Covid-19.

Keywords: Preventive Behaviors, Sheep Farmers, Ranchers, prevalence, Covid-19.

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1. Introduction

The prevalence of epidemics shows that the prevalence of Ebola in West Africa between 2013 and 2016, the outbreak of the coronavirus in 2002 and 2003, and its developed form in 2019, acute respiratory infection of SARS-CoV, have led to more than 8,000 human infections with the 10% death (Vergara-Alert et al., 2017). The coronaviruses are large and enveloped and positive-stranded RNA viruses that are classified as coronaviruses in the coronavirus family and the order Nidovirales (Murray et al., 2010). Evidence suggests that from a sequence homology perspective, a group of coronaviruses, such as swine-borne gastroenteritis virus causes intestinal and enteric disease in domestic animals (Murray et al., 2010) and Bovine coronavirus mainly causes intestinal disease in cattle (Burimuah et al., 2020), feline coronavirus (FCoV) and Canine coronavirus have also been reported (Murray et al., 2010). Following the diagnosis of coronavirus in dromedary camels of Saudi Arabia, Oman, and Qatar, these animals were identified as a potential source of transmission of coronavirus (Munyua et al., 2017) and infection of the Middle East Respiratory Syndrome virus to humans, a high percentage of dromedary camels (56.4%) provide the evidence of MERS-Covid infection (Kasem et al., 2018). In 2013, a new human coronavirus called the Middle East respiratory syndrome coronavirus, MERS-CoV, with severe pneumonia emerged in Saudi Arabia, by December 2016, MERS had more than 1,800 cases and a 35% mortality rate (Vergara-Alert et al., 2017). The Middle East Respiratory Syndrome led to human disease for the first time since 2012 (Kasem et al., 2018).

Most research in the field of Covid-19 disease focuses on the behavioral patterns of citizens living in urban areas as a significant center of the human population, with less attention to the behavior of rural people as the most important actors associated with the primary links of the food production and supply chain (Yazdanpanah et al., 2020; Pakravan-Charvadeh et al., 2021; Burlea-Schiopoiu et al., 2021). In the supply chain of livestock products, ranchers play a vital role in shortening the treatment chain of Covid-19 disease because they are directly and closely associated with the livestock products and their behaviors play a significant role in reducing the prevalence and transmission of Covid-19 to humans.

Due to the physiological similarities between humans and animals, the coronavirus has the potential to cause a common disease between them. Before the spread of the coronavirus in the world, the transmission of the virus, called MERS, originated in camels. Evidence from phylogenetic analysis and MERS-Covid isolates (MERS CoV) showed that the sequences are closely related to other MERS-Covid strains derived from camels and humans (Kasem et al., 2018). Performing preventive and health care behaviors by farmers in production units has an important role in preventing the development and spread of Covid-19 because 60% of infectious diseases have a common origin in humans and animals (Hashem et al., 2020), as emphasized future population food requirements for health (Desjardins et al., 2010). Being cognizant of the potential role of livestock in disease transmission is vital for understanding the epidemiology of the disease (Vergara-Alert et al., 2017). In particular, from the perspective of farmers, compared to the direct costs of the production unit, the effects of common disease risks between humans and livestock are less obvious and considered (Kristensen & Jakobsen, 2011). Today, in health care policies, special attention is paid to preventive measures, especially these measures play a substantial role in shortening the treatment chain of Covid-19. Evidence suggests that appropriate preventive measures have played a crucial role in controlling calf diarrhea (Rai et al., 2011).

According to the World Health Organization, the number of cases of Covid-19 disease in Iran reached 2,093,452 cases, being conducive to the death of 64,764 people. The application of preventive behaviors has a vital role in shortening the treatment chain of the disease (WHO, 2021). From the technical point of view of treatment, it is also important to pay attention to the behavioral patterns of ranchers in preventing the outbreak of Covid-19 disease, despite the policies' emphasis on finding an animal model of disease to produce a vaccine (Vergara-Alert et al., 2017) and antibiotics, excessive use of vaccines and antibiotics in livestock leads to the development of bacteria resistant to them (Dixon et al., 2014). Economically, the prevalence of pathogens can also affect economic systems. Evidence shows that as a result of the pandemic SARS epidemic, the

global economy has cost between $ 30 billion and $ 100 billion (Veterinary Report Towards One Health, 2012).

Although much evidence on consumers' behaviors and veterinarians' perspectives against Covid-19, nor have the past inquiries surveyed ranchers and livestock breeders' hygiene behaviors against Covid-19, serving as the main actors in the supply chain of livestock-product. However, after the emergence of Covid-19, the country's research system has conducted significant research to promote disease prevention behaviors using samples from patients, citizens, and medical staff (Khazaee-Pool et al., 2020; Nasirzadeh et al., 2020; Rahmanian et al., 2020) and significant studies on the intent and behavior of ranchers, producers of livestock products and products to prevent the spread of various common diseases between livestock and humans, for example, Congo fever (Masoudy et al., 2016), anthrax (Seid et al., 2020), Escherichia coli (Toma et al., 2015), gastrointestinal nematode (Velde et al., 2015), and Malta fever (Babaei et al., 2014); but very little research has been done on the study. The behavior of ranchers has been done to prevent the outbreak of Covid-19, therefore, the present study would investigate the causal relationship between the factors affecting the preventive behaviors of ranchers in the Sahand Mountains of Maragheh township from the outbreak and spread of Covid-19. The following objectives of the research are presented:

(1) To identify the determinants of behaviors to prevent the spread of Covid-19;
(2) Determining the strength of the theory of planned behavior and the health belief model in predicting the variation of behavior to prevent the spread of Covid-19;
(3) Determining the interactions of driving factors and the level of livestock production units;
(4) Providing the management implications to the veterinary network to disseminate among the community of farmers to apply preventive behaviors to reduce the prevalence of Covid-19.

2. Research Theoretical Literature

2.1. Theory of planned behavior (TPB)

The basic premise of the TPB is that persons express rational behaviors in the form of a balance between the benefits and costs of behavior, as they also express views about the desirability or undesirability of behavior (Ajzen & Driver, 1922). The three main constructs of the TPB (i.e., attitude, subjective norms, and behavioral control) predict behavioral intent and indirectly influence individuals' actual behaviors (Fishbein & Ajzen, 1977). The reason for using this theory in this research is that it is now accepted that the motivations of ranchers to continue a behavior and accept behavioral changes are not rooted solely in economic or financial aspects and cannot be based solely on simple concepts of economic rationality. Despite the importance of cost and benefit in measuring choices, ranchers operate in a social context that either confines the behavioral choices or facilitates and gives rise to choices (Garforth, 2015) (see figure 1).

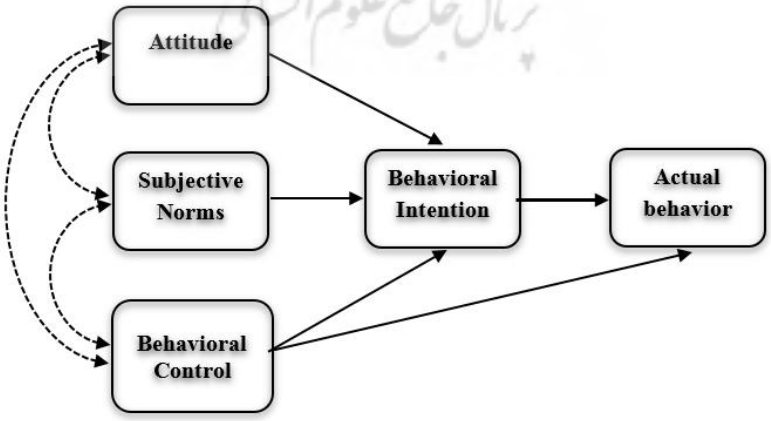


figure. 1. Theory of planned behavior (Fishbein and Ajzen, 1977)

2.2. Health belief model

Many studies have used the health belief model to explain health behaviors (Karimi Aval et al., 2019; Garforth et al., 2013; Velde et al., 2015; Yazdanpanah et al., 2020). The reason for using the health belief model in this research is the most semantic and content compatibility of its structures with the context and objectives of the research. In the field of livestock behavior, some studies have studied the behavior of this group of people. Technically, this model has been the basis for examining measures based on anti-virus treatments, such as Crimean – Congo hemorrhagic fever (CCHF) (Whitehouse, 2004; Paragas et al., 2004). Evidence shows that the educational intervention implemented by the health belief model has a favorable effect on reducing risk factors and improving preventive behaviors of brucellosis in farmers (Farzadmehr et al., 2019) (see Figure 2).

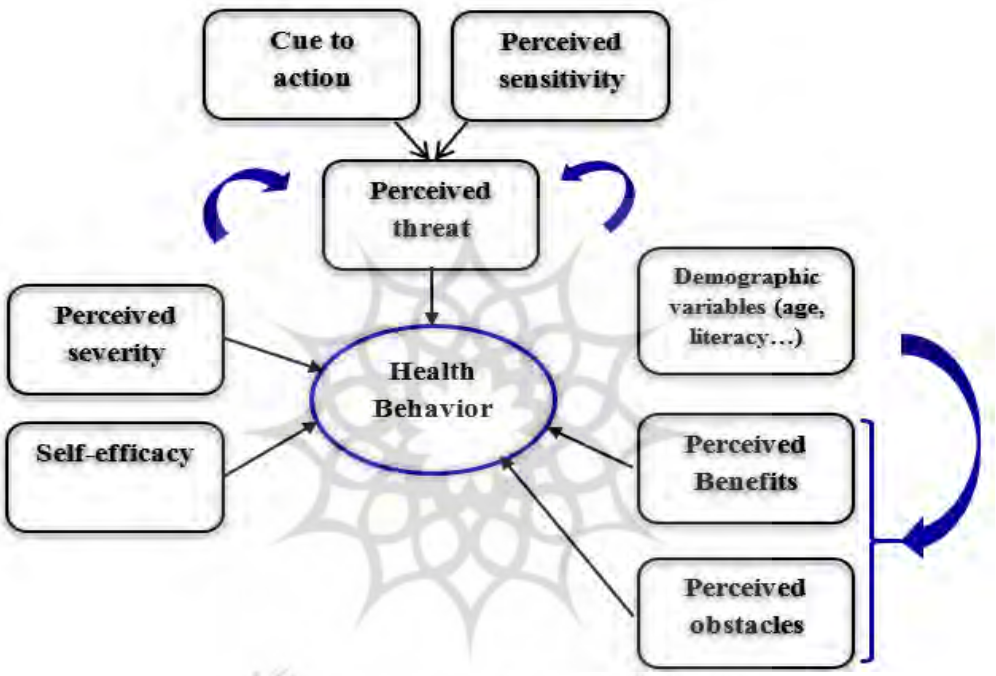


Figure. 2. Health belief model
(Glantz cited in Wilson et al., 2015)

The reason for combining the two models is that, for example, a study by Velde et al. (2015) shows that the combined model accounts for 46% of the variance of intent to accept targeted diagnosis and therapies and targeted therapies. Table 1 shows the conceptual constructs of the two theories.

Table 1. Conceptual constructs of the two theories of planned behavior and the pattern of health belief

Theory	Construct	Conceptual definition	Application
TPB	attitude	The evaluation of the desirability/desirability of a fact or object.	Orientation to execute an action or project. Prevent social, economic, and financial losses and costs. Implement a measure.
	Subjective norms	person's perception that his or her close and respected friends are encouraging or hindering a behavior.	Getting help from people with cultural norms to institutionalize a behavior / change a behavior.
	PBC	The perception that one is able to do a healthy behavior.	Provides PBC in performing recommended actions, training, and guidance. Uses progressive goal setting. Gives verbal reinforcement. Shows desirable behaviors.

Theory	Construct	Conceptual definition	Application
			Reduces anxiety.
HBM	Perceived sensitivity	Belief in the possibility of danger or disease.	Defines the level of the population at risk. Personalizes risk based on a person's characteristics or behavior. Makes perceived sensitivity more compatible with a person's actual risk.
	Perceived severity	Belief in the seriousness of the situation and the continuity of its results.	Determines the consequences of hazards and conditions
	Perceived benefits	Belief in the effectiveness of the recommended action to reduce the risk or severity of its effect.	Defines the action is taken (how, where, when). Clarifies the expected positive effects.
	Perceived obstacles	Belief in the tangible and psychological costs of recommended action.	Identifies and reduces understandable barriers through reassurance, correction of misinformation, incentives, and assistance.
	Cue to action	Strategies to activate individual readiness.	Provides information, awareness-raising, and the use of appropriate reminder systems.
	Trust in the government	The level of people's trust in government agents, specialists, and policymakers.	Facilitate the change of inappropriate behaviors, avoid spending financial resources and spend a lot of time changing inappropriate behaviors.

Note: Adapted from Glantz cited in Wilson et al. (2015) and Ajzen & Driver (1992)

2.3. Preventive behavior against the spread of coronavirus

Understanding behavior as an observable, continuous, and long-term action is relevant to the discussion of rationalism. Farmers and ranchers engage in behaviors that make sense to them under the certain farm, family, and business conditions (Garforth, 2015). In the field of health, behavior relies on health-based actions. Recognizing biosafety in production units is a new way to motivate and encourage farmers to manage and control disease (Maye & Chan, 2020). However, despite having sufficient awareness of biosafety, farmers do not necessarily perform the best animal health practices in production units (Palmer, 2009). In this regard, the main challenge for policymakers, veterinarians, and public health professionals is to gain an understanding of the rationality of ranchers and how they see and evaluate the world (Garforth, 2015). In the meantime, official institutions provide scientific, logical, and technical reasons for encouraging ranchers to adopt biosecurity practices on the farm; whereas, ranchers and farmers resist the acceptance of treatment methods based on animal health and form rationality based on social, cultural, and economic contexts (Palmer, 2009).

2.4. Attitudes towards Covid-19

It includes the attitude of judgments and evaluations based on desirability and non-desirability about objects and subjects. In the field of animal health, attitudes are related to views based on online information or information retrieved from the memory of farmers, which, given the economic, technical, and financial conditions of the farm, can be the nature of a disease agent. Evaluate diagnostic or therapeutic measures such as antiviral, antibacterial, and antiparasitic measures, for example, Kristensen and Jakobsen (2011) state that Danish ranchers' perceptions of biosecurity vary and have a variety of perspectives, including participatory, ambiguous, elusive, and introverted. The first view is based on external decisions and actions (External biosecurity) and participation. The nature of the second view is ambiguous, with a civilized, laborious approach, and more of a kind of mental and impractical expression (Trouble with more abstract). The third view considers these measures to be based on a civilized approach, disregarded rules and legislation, and the fourth view focuses on the introverted nature of internal herd management. Garforth et al. (2013) combined the TPB with the HBM to study the biosafety behaviors of sheep and pig herders and state that disease management behavior is influenced by

their attitudes toward actions. Toma et al. (2015) also report that attitudes help shape the behavioral tendencies of ranchers to control and manage Escherichia coli infections. A study in the northeastern regions of Ethiopia shows that anthrax prevention practices are more likely to be performed by farmers with a positive attitude (Seid et al., 2020). Velde et al. (2015) reported that Belgian ranchers' attitudes toward diagnostic methods are the strongest predictors of acceptance of diagnostic methods such as targeted therapies and selected targeted therapies. Jack et al. (2017) describe concerns about increasing resistance to anthelmintic resistance in sheep herds in the UK to 400 ranchers using a conceptual model based on socio-psychological factors. They surveyed and concluded that a positive attitude towards nematode control services is the main reason for accepting sustainable methods of parasite control.

2.5. Subjective Norms (SNs)

The mental norm of a person is defined as the fact that close and respected friends encourage or hinder a behavior (Ajzen & Driver, 1992). Evidence suggests that mental norms include ranchers' perceptions of what celebrities do in similar situations and their understanding of important issues that play a decisive role in adopting measures to manage parasitic diseases (Garforth et al., 2013). By integrating the TPB and the HBM, Velde et al. (2015) accentuate an introduction to the importance of sustainable control strategies to antiparasitic resistance in dairy cows in Belgium, as concluded, the SNs is one of the factors influencing the intention of dairy farmers to use diagnostic methods such as targeted therapies and targeted therapies.

2.6. Perceived Behavioral Control (PBC)

The PBC consists of two parts (1) the mentality of individuals to be able to perform a behavior and (2) environmental conditions and infrastructure. The first part deals with the perceived ability of ranchers to implement control behaviors to prevent and prevent the spread of disease, which is known as self-efficacy. The experience shows that disease management behavior among ranchers is influenced by their perception of the effectiveness of methods to reduce disease risk, their understanding of their ability to apply specific methods, and their understanding of factors that limit their ability to influence specific factors (Garforth et al., 2013). In the field of preventive behaviors to prevent the spread of Covid-19 (Yazdanpanah et al., 2020) reported that by finding a pattern of health belief, self-efficacy has a positive and significant effect on prevention intentions and behaviors. Research shows that self-efficacy plays a key role in predicting changes in ranchers' preventive behavior in preventing the spread of malaria (Babaei et al., 2014) and Crimean-Congo fever (Karimi Aval et al., 2019; Masoudy et al., 2016). Khazaee-Pool et al. (2020) reported that among the constructs of the health belief model, self-efficacy has the strongest predictor and the largest share in predicting the prevention behavior of Covid-19. Also, evidence suggests that PBC has a positive effect on the willingness to accept diagnostic and therapeutic methods among dairy farmers (Velde et al., 2015).

2.7. Behavioral intention (BI)

In their study examining the determinants of occupational behavior of 283 farmers in Flanders using the TPB to conceptualize the constructs that predict intention and behavior, Colémont and Van den Broucke (2008) concluded that behavioral intention has a positive and significant effect on their preventive behaviors. Moreover, Yazdanpanah et al. (2020) surveyed 305 rural youth in rural areas of Southeastern Iran and concluded that behavioral intention has a positive and significant effect on preventive behaviors of rural youth and the highest variance of behavior explained and estimated by behavior intention.

2.8. Perceived sensitivity

Sensitivity is defined as the belief that a person is at risk for disease (Glantz cited in Wilson et al., 2015). Evidence suggests that perceived susceptibility is an important predictor of protective behavior against infectious diseases (Bish & Michie, 2010). In the study of factors affecting the prevention behaviors of brucellosis in livestock farmers in Charroimagh, Babaei et al. (2014) showed that perceived sensitivity is one of the strongest predictors of livestock behavior. Karimi Aval et al. (2019) also provide evidence that Crimean-Congo antipyretic behaviors in ranchers are positively correlated with perceived sensitivity. In a descriptive-analytical study using 400 people in Mazandaran province, Khazaee-Pool et al. (2020) have concluded that the behavior of preventing the spread of Covid-19 disease and perceived sensitivity are significantly correlated to each other. In contrast to research in the field of animal health, which shows the positive effect of the perceived sensitivity variable, the study of

Velde et al. (2015) shows that perceived sensitivity has a significant effect on the intention to accept the method. There are no diagnostic tools in the field of treatment of livestock parasitic diseases.

2.9. Perceived severity

The evidence from the study of Yazdanpanah et al. (2020) suggests that perceived severity has a positive and significant effect on behavioral goals and intentions in preventing the spread of Covid-19. Also, perceived severity has a positive and significant effect on preventive behaviors. Evidence also suggests that the greater perceived severity of the disease is an important predictor of behavior for protection against pandemic diseases (Bish & Michie, 2010). Karimi Aval et al. (2019) also believe that Crimean-Congo antipyretic behaviors in ranchers have a positive correlation with perceived severity. Other studies have reported the lack of effect of the intensity variable perceived by ranchers on the acceptance of diagnostic methods, due to low perception of the threat of disease (Velde et al., 2015).

2.10. Perceived benefits

By surveying 200 cattle farmers in Zabol city using a questionnaire including the constructs of HBM, Masoudy et al. (2016) provided evidence that behaviors to prevent the spread of Congo fever have a positive and significant relationship with perceived benefits. In a study by Renault et al. (2020), the perceptions of 988 heavy livestock breeders in Belgium, France, Germany, Spain, and the Netherlands about biosecurity measures were identified. This study showed that the actual implementation of health measures is significantly affected by farmers' perceptions of the perceived benefits of these measures. In the field of preventive behaviors to prevent the outbreak of Covid-19 disease, the evidence also showed that there is a positive and significant correlation between the prevention behavior of Covid-19 disease and perceived benefits (Khazaee-Pool et al., 2020).

2.11. Perceived obstacles

Evidence suggests that Crimean-Congo antipyretic behaviors in livestock farmers have a significant negative correlation with perceived barriers (Karimi Aval et al., 2019). In the field of corona outbreak management, there is also evidence that the greater the barriers to preventing Covid-19, the slower the onset of behaviors (Khazaee-Pool et al., 2020). In the field of meat management, a study by Hambolu et al. (2013) shows that tuberculosis risk behaviors among meat sellers in Nigeria who eat contaminated parts of the lungs. To reassure customers that the meat they eat is safe, it is accompanied by a barrier that restricts sales without tasting the meat.

2.12. Cue to action

Guidelines for action include strategies for activating a person's preparedness to deal with a disease agent (Glantz cited in Wilson et al., 2015). Guides include reading scientific resources such as newspapers or articles, organizing lectures and encouraging people to participate in them, and distributing scientific and promotional journals (Yazdanpanah et al., 2015). In the field of livestock disease management, there is evidence of the effect of variable guidance for action on livestock behavior. For example, Babaei et al. (2014) report that the practice guide is a strong predictor of antipyretic pastoral behavior in ranchers. Karimi Aval et al. (2019) also provide evidence that Crimean-Congo antipyretic behaviors in ranchers have a positive and significant relationship with practice guidance. Jack et al. (2017) also believe that encouraging ranchers to test the effectiveness of treatment in the area of sustainable control of parasitic diseases is part of the guidance-related measures needed to change farmers' perceptions of risk.

2.13. Trust in the government in controlling the corona

Trust in government specialists and agents is one of the fundamental components for the participation of livestock breeders, dairy farmers, and herders in accepting preventive activities in livestock units. Even, the participation of farmers in government projects aimed at managing and controlling livestock diseases and promoting anti-disease activities is related to the component of trust in government agents. In this regard, the evidence suggests that the way farmers view the sources from which they obtain information is one of the reasons why their decisions are not always the ones that others expect; some recommendations are not accepted simply because the farmer does not consider the person or organization as a reliable source (Garforth, 2015). There is also evidence that greater trust in authorities is associated with preventive behavior in pandemic diseases (Bish & Michie, 2010). Manufacturers use their information more when the source of information

is reliable and trustworthy. Experience shows that livestock breeders in Australia use veterinarians, Table 2 displays the hypotheses of the study.

industry agencies, and the government as sources for reliable information (Paquette et al., 2020).

Table 2. Hypotheses of the study

Hypothesis	Hypothetical Statements
1	Attitude has a positive effect on farmers' behavior to prevent the spread of Covid-19.
2	SNs have a positive effect on farmers' behavior to prevent the spread of Covid-19.
3	PBC has a positive effect on farmers' behavior to prevent the spread of Covid-19.
4	BI has a positive effect on livestock prevention behavior of Covid-19.
5	Perceived sensitivity has a positive effect on farmers' behavior to prevent the spread of Covid-19.
6	The perceived severity has a positive effect on farmers' behavior to prevent the spread of Covid-19.
7	Perceived benefits have a positive effect on farmers' behavior to prevent the spread of Covid-19.
8	Perceived barriers have a negative effect on farmers' behavior to prevent the spread of Covid-19.
9	Trust in government has a positive effect on farmers' behavior to prevent the spread of Covid-19.
10	Cue to action has a positive effect on farmers' behavior to prevent the spread of Covid-19.

3. Research Methodology

Based on the quantitative paradigm and non-experimental research design, the study benefits from the cross-sectional survey to gather quantitative data.

This study was conducted in Maragheh Township, being ranked as third in production in East Azerbaijan province, Iran (IRNA News Agency, 2020a). In this township, 60,000 tons of livestock and poultry feed are annually produced (IRNA News Agency, 2020b). The production of this township includes 34,000 tons of milk, 2.4 thousand tons of sheep meat, 7,000 tons of poultry meat, 19,000 tons of eggs, and 3.1 thousand tons of fish meat (ISNA, 2021). The share of light dairy cattle is 11,000 tons with 100,000 heads and the share of heavy dairy cattle is 23,000 tons of milk with 12,000 heads. The total number of heavy livestock in the township is 22,000 and the total number of light livestock is about 204,000. Heavy livestock of the township is raised in 67 units of industrial and semi-industrial livestock and 40 units of sheep and the rest in traditional rural livestock. Therefore, the study of the intentions and behavior of farmers in preventing the outbreak of Covid-19 is a necessary measure in the production units of livestock products in this township.

In this study, data and information were collected from ranchers and sheep farmers using the techniques of the focus group, structured interview, and survey using questionnaire.

In this study, according to the population of the livestock community of Maragheh township, the sample size was determined using the Krejcie-Morgan table, with a margin error of 5% (N ≈1200) (Krejcie & Morgan, 1970). To survey the research sample, a stratified random sampling method with appropriate assignment according to the geographical areas of Maragheh township (district and village) was used. After estimating the sample size, the villages in each stratum (or village) were selected by a simple random sampling method and according to the ratio of the number of farmers to the total population of farmers in each village, a percentage of the sample size was allocated to them. It should be noted that Maragheh township has 6 villages (South Sarajoo, East Sarajoo, West Tea Teapot, North Sarajoo, West Sarajoo (Central), and Qara Naz) which according to the number of farmers in each village were surveyed.

In the present study, quantitative data analysis was performed using SPSS24 software. Some statistical methods and models for analyzing quantitative data include the linear regression model (LRM), analysis of variance, and univariate GLM.

To achieve acceptable face validity of the questionnaire, as the main instrument of data collection, a group of experts in the fields of agricultural extension, animal husbandry, and veterinary medicine was used, thereby expressing their views and opinions on the wording, correction of inappropriate items in measuring in indices, confirm the logical number of questions of the whole questionnaire, partial questions, not being on-general, one-sided questions and also confirm the logical number of selected questions of each concept (or construct) and based on their comments and suggestions, the questionnaire was modified.

4. Research Findings

4.1. Descriptive statistics

As illustrated in Table 3, the descriptive results of the research show that 94.7% of the respondents are male and the rest (5.3%) are female. According to the achieved result, the average of respondents is 47.74 years, which indicates that the sheep farmers are adults, also the experience average is 31.14 (SD = 16.97). The largest number of respondents fall under the category elementary school and guidance and high school, with an aggregate percentage of 74.2%. About the nature of production units, this variable includes three categories of mechanized (13%), semi-mechanized (22.7), and traditional (64.3%), the highest frequency is related to traditional animal husbandry and the lowest frequency pertains to the mechanized category. In addition, the vast majority of the studied ranchers own their production unit. In terms of the number of animals, the collected data show that the frequency of heavy and light livestock is 105,896 and 345,577. Given the economic feature, respondents have indicated that they fall under the category of favorite status (n = 181, 87.4).

Table 3. Descriptive statistics of sample (n = 207)

Variables	Level	(%)	Mean or Sum($\sum x_i$)	SD
Gender	Male (n = 196)	94.7		
	Female (n = 11)	5.3		
Age			41.74	16.97
Educational attainment	Illiterate (n = 44)	22.7		
	Elementary school (n = 58)	29.9		
	Guidance and High School (n = 86)	44.3		
	Bachelor (n = 4)	2.1		
	Masters and higher (n = 2)	1		
Livestock work experience			31.14	16.97
Type of livestock ownership	Owner (n = 176)	85		
	Rentier (n = 15)	7.2		
	Owner-renter (n = 12)	5.8		
	Livestock worker (n = 4)	1.9		
Prevalence of Covid-19	High risk (n = 19)	9.2		
	Low risk (n = 150)	72.5		
	Safe (n = 38)	18.4		
Type of production unit	Mechanized production unit (n = 27)	13		
	Semi-mechanized production unit (n = 47)	22.7		
	Traditional production unit (n = 133)	64.3		
Number of livestock	Heavy livestock (n = 60)		105,896	
	Light livestock (n = 147)		345,577	
Number of visits to the Veterinary Network Organization per month			2.58	1.29
Economic status	Very Undesirable (n = 0)	0		
	Undesirable (n = 0)	0		
	Medium (n = 11)	5.3		
	Favorite (n = 181)	87.4		
	Very Desirable (n=15)	7.2		
Access to bank credits	Yes (n=23)	11.1		
	No (n=184)	88.9		

Note: Some variables have a nominal scale, where, others have a scale measure.

Table 4 shows the research indicators and respective items, the measurements of construct- average and Cronbach's alpha are also illustrated

Table 4. Measurements of TPB and HBM

Theory/Items	Mean (Std. Deviation)	Cronbach's Alpha
THEORY OF PLANNED BEHAVIOR		0.70
1. Attitude towards Covid-19	3.62(0.94)	
Corona is a dangerous disease.		
Corona endangers human health.		
Corona endangers the health of the rancher.		
Corona endangers the health of livestock products (meat and dairy).		
2. SNs	4.04(0.67)	
People who are important to me think that I should take preventive measures to prevent Covid-19.		0.77
My family members consider it important to take preventive measures to prevent Covid-19.		
My friends think that preventative measures are useful to prevent Covid-19.		
3. PBC	3.74(0.66)	0.56
I am confident that I can take preventive measures to prevent Covid-19.		
I have the necessary skills to take preventive measures to prevent Covid-19.		
I have the necessary financial resources to take preventive measures to prevent Covid-19.		
I have the necessary tools and facilities to take preventive measures to prevent Covid-19.		
4. Intention	4.09(0.55)	0.81
I plan to take preventive measures to prevent Covid-19 in the next 6 months.		
I intend to encourage other ranchers to take preventive measures to prevent them from developing Covid-19.		
I plan to attend preventive measures classes to prevent Covid-19.		
Behavior (Preventive measures against coronavirus)		
HEALTH BELIEF MODEL		
5. Sensitivity	4.02(0.88)	0.73
How likely do you think it is that patients with Covid-19 will recover within the next month?		
How likely do you think it is that Covid-19 can be transmitted from humans to livestock?		
How likely do you think it is that livestock products (meat and dairy) will be infected with the Coronavirus?		
6. Severity	2.96(0.63)	0.83
It will be very serious and difficult for me to get Covid-19.		
My Covid-19 causes me a lot of mental problems.		
If my animals get Covid-19, my life will be in jeopardy.		
My Covid-19 causes me a lot of economic problems.		
If my livestock products are contaminated, my customers' purchases will be reduced.		
If the contamination of my livestock products is confirmed, the credibility of my products among customers will decrease.		
7. Cue to action	3.78(0.98)	0.82
Study of scientific materials in the field of common diseases between animals and humans, transmission routes, and health recommendations regarding the consumption of food products of animal origin		
Find out about Covid-19 in newspapers, radio and television, and the veterinary network		
Discussion with experts of the veterinary Department about ways to prevent and deal with Covid-19		

Theory/Items	Mean (Std. Deviation)	Cronbach's Alpha
8. Perceived benefits	3.82(0.89)	0.83
Preventive measures can prevent Covid-19.		
Preventive measures prevent me from transmitting the disease to livestock.		
Doing preventative measures makes me feel better (less stressed).		
9. Perceived obstacles		
Preventive measures cost me a lot of money.	3.85(1.10)	0.76
Low government financial support for ranchers is an obstacle to preventive measures.		
10. Trust	3.69(1.11)	0.86
I trust what veterinary network experts say about Corona.		
I trust the government's proposed measures (Corona Anti-Corruption Protocols) to curb Covid-19.		

4.2. Sub-division of behavior (BHV)

Table 5 shows the behaviors of ranchers regarding preventive measures against Covid-19. On average, the general index of ranchers' behaviors in coronavirus prevention is 3.94 ($\bar{x}$ = 3.94; Std. Deviation = 0.34), which indicates that ranchers' general behavior is between "sometimes" and "often." This variable has three sub-variables (1) use of personal protective equipment and facilities ($\bar{x}$ = 4.20; Std. Deviation = 0.60), (2) observance of protection and health principles ($\bar{x}$ = 3.81; Std. Deviation = 0.31), and (3) refraining behavior (i.e., Avoidance) ($\bar{x}$ = 3.83; Std. Deviation = 0.59). The first treatment with the three variables "use of masks, gloves, and hats and work clothes in the production unit," "wearing masks and wearing gloves, hats and work clothes before entering the production unit," and "use of disinfection pool to enter the stables were weighed. As can be seen, all sub-behaviors have a value higher than the average mean. The highest average of the sub-index is related to the first index (i.e., the use of personal protective equipment and facilities). We compared the sub-division of BHVs regarding production units (i.e., Mechanized, semi-mechanized, and traditional). There is a significant difference among production units respecting the item of "Extensive cleaning and disinfection of the exterior and interior floor of the stables and springs with alcoholic disinfectants, other disinfectant materials" ($F(df_{Total} = 204) = 3.21$, $p < 0.05$) (see Table 6). The average of this item in semi-mechanized production units (Mean = 1.72) is more than the two production units of mechanized (Mean = 1.45) and traditional (Mean = 1.38).

Figure 3 illustrates the results of correlation analysis (or Zero-ordered correlation), partial correlation, and part correlation, just the association of SNs ($r_{Z-O} = 0.46^{p<0.001}$; $r_{Partial} = 0.35^{p<0.001}$; $r_{Part} = 0.29^{p<0.001}$), PBC ($r_{Z-O} = 0.51^{p<0.001}$; $r_{Partial} = 0.46^{p<0.001}$; $r_{Part} = 0.41^{p<0.001}$), and severity ($r_{Z-O} = -0.07^{p<0.05}$; $r_{Partial} = -0.14^{p<0.05}$; $r_{Part} = -0.11^{p<0.05}$) with BHV is statistically significant. The coefficient of partial correlation demonstrates the association of dependent variable with a special independent variable if the correlational association of other independent variables in regression function with the that independent and dependent variable is constant, as the same for part correlation, except the correlational relationship of other independent variables on just respective independent variable stays constant (Munro, 2005).

Table 5. Details of BHVs of ranchers concerning preventive measures against coronavirus

Behavioral preventive measures against coronavirus	Symbol in SPSS	Never	Rarely	Sometimes	Often	Always
1. Personal Behavior (Personal protective equipment) ($\bar{x}$ = 4.20) (Std. Deviation = 0.60)						
Use of masks, gloves, hats and work clothes in the production unit.	BHV1	0.5	1.5	4.9	60.5	32.7
Put on a mask and wear gloves, hats, and work clothes before entering the production unit.	BHV2	0.5	2.0	8.3	50.7	38.5

Behavioral preventive measures against coronavirus	Symbol in SPSS	Never	Rarely	Sometimes	Often	Always
Use the disinfection pond to enter the stables.	BHV3	0.5	22.4	42.4	34.6	.5
2. Observance of protection and health principles ($\bar{x}$ = 3.81) (Std. Deviation = 0.31)						
Regular bathing, regular handwashing with soap and water.	BHV4	0	2.9	25.4	41.0	30.7
Extensive cleaning and disinfection of the exterior and interior floor of the stables and springs with alcoholic disinfectants, other disinfectant materials.	BHV5	0	3.9	19.0	46.8	30.2
Cleaning and disinfecting the equipment of the production unit with alcoholic disinfectants and etc.	BHV6	1.0	.5	4.4	36.1	58.0
Covering the coughs and sneezes with a tissue.	BHV7	12.3	13.2	11.3	34.3	28.9
Isolation and quarantine of animals with a history of disease or physical weakness of healthier animals.	BHV8	40.7	24.5	6.4	17.2	11.3
Reading the instructions of the department and the veterinary network.	BHV9	26.3	29.8	24.4	13.2	6.3
Calling a veterinarian to inspect the animals, monitor, and screen them.	BHV10	3.9	17.6	11.7	32.7	34.1
Take cold medicine to livestock	BHV11	18.5	15.6	16.6	28.8	20.5
Provide sheltered, windbreak, dry bed, and insulation shelter for livestock	BHV12	1.0	1.0	3.4	50.2	44.4
Proper nutrition of livestock with suitable nutrients (fresh and high energy fodder, concentrate)	BHV13		1.4	4.3	51.2	43.0
Storage of livestock fodder in a suitable place (dry and free of moisture), to prevent fungal infection and production of aflatoxin toxin	BHV14	0	1.4	9.2	47.8	41.5
Vaccination of livestock against diseases that can cause Covid-19 (such as snow fever, malt, etc.)	BHV15	0	2.9	4.8	28.5	63.8
Use a ventilator and leave the doors and windows of livestock halls open	BHV16	0	1.9	9.2	55.1	33.8
3. Avoidance behavior ($\bar{x}$ = 3.83) (Std. Deviation = 0.59)						
Staying at home and resting during illness or having symptoms (e.g., cough, sneezing, fever).	BHV17	0	1.9	9.2	56.0	32.9
Avoiding close contact with people who have symptoms of a disease such as, cough, fever, or a history of illness, or are suspected of having the disease.	BHV18	1.5	2.9	23.3	43.2	29.1
Reducing the use of public places in daily life activities (e.g., friendly outings, crowded places, markets).	BHV19	3.9	12.2	13.7	51.7	18.5
Considering social distance when confronting friends or livestock workers.	BHV20	2.9	11.7	10.2	53.2	.22
Avoiding touching face, nose, or mouth with dirty hands.	BHV21	2.4	13.2	15.1	45.4	23.9
Refraining from entering unauthorized persons to places of keeping or slaughtering the livestock.	BHV22	11.9	10	9	39.8	29.4
Preventing people other than the personnel of the production unit from entering the production site (such as neighbors, customers, etc.)	BHV23	9.8	10.3	6.9	43.6	29.4

Table 6. Comparison of BHVs in production units (i.e., Mechanized, semi-mechanized, and traditional)

	Production Unit Type	F	*p*-value

Preventive measures against Covid-19	Mechanized (n=27)	Semi-Mechanized (n=47)	Traditional (n=133)		
PB	4.24	4.11	4.13	0.99	ns
MASK1	4.29	4.17	4.08	1.43	ns
MASK2	4.30	4.11	4.23	1.27	ns
DISINF	4.14	4.06	4.08	0.18	ns
OPHP	3.80	3.81	3.88	0.73	ns
BATH	4.02	3.98	3.88	0.31	ns
ALCOH1	**1.45**[a]	**1.72**[b]	**1.38**[c]	**3.21**	***p* < 0.05**
ALCOH2	3.52	3.65	3.50	0.52	ns
COVER	3.52	3.65	3.50	1.32	ns
ISOLAT	2.21	2.64	2.44	1.22	ns
READ	2.37	2.57	2.50	0.17	ns
VETERI	3.73	3.85	3.69	0.73	ns
COLD	3.23	3.15	2.92	0.63	ns
SHELTE	4.35	4.34	4.48	1.52	ns
NUTRI1	4.35	4.30	4.52	1.43	ns
NUTRI2	4.31	4.21	4.37	1.27	ns
VACCI	4.53	4.43	4.74	1.18	ns
VENTI	4.22	4.13	4.30	1.63	ns
AB	3.83	3.82	3.85	0.01	ns
STAY	4.19	4.17	4.30	1.52	ns
CLOSE	3.89	4.00	4.22	1.43	ns
PUBLIC	3.68	3.67	3.73	1.27	ns
SOCIAL	3.79	3.76	3.88	0.18	ns
TOUCH	3.75	3.76	3.73	0.73	ns
PLACE	3.75	3.76	3.73	0.31	ns
PERSON	3.73	3.60	3.31	0.75	ns
MASK1	3.71	3.74	3.77	1.43	ns
Total BHV	3.95	3.91	3.95	0.54	ns

Note: Numbers in bold are related to the total average of indices. Average is between 1 and 5 ($1 \leq \bar{x} \leq 5$).

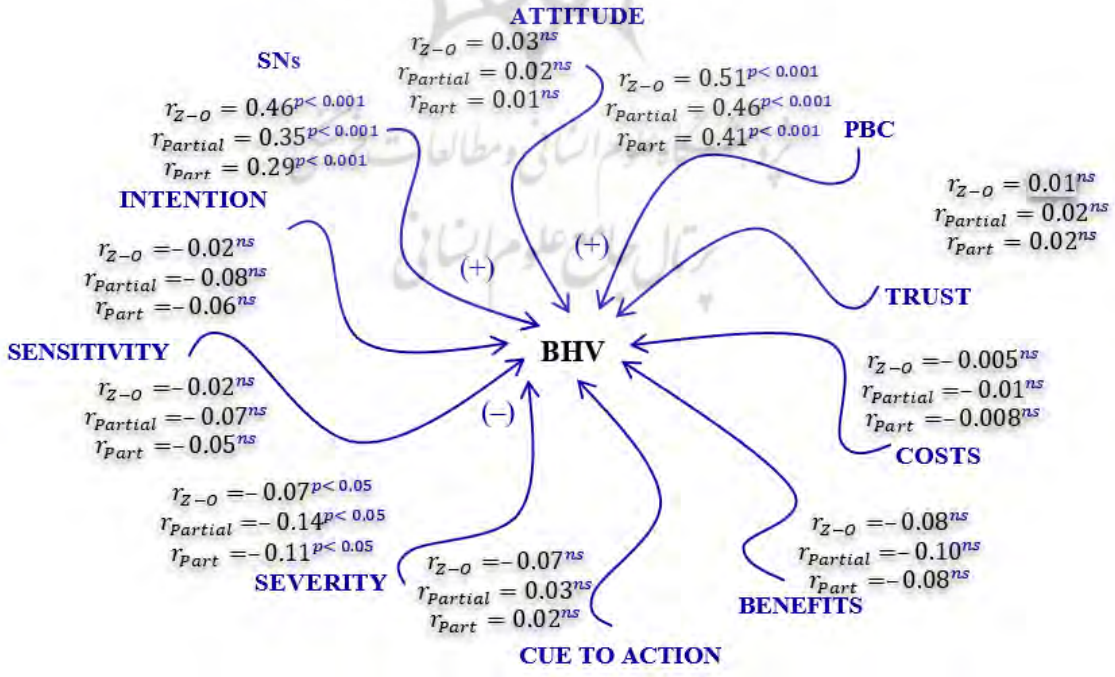


Figure. 3. Correlation analysis or Zero-ordered correlation (Z-O), part and partial correlation

Table 7 manifests the measurements of the VIF and Tolerance indices. As can be seen, the cut-off rate for VIF (VIF <10) and Tolerance (Tolerance = $\frac{1}{VIF} > 0.20$) is well observed. These values indicate that the linear effect does not threaten the analysis and provides the necessary preparation for subsequent inferential analysis.

Table 7. VIF and Tolerance of indices

Variables	Collinearity statistics	
	VIF	Tolerance
Attitude	1.101	0.908
SNs	1.275	0.784
PBC	1.167	0.857
Behavioral Intention	1.052	0.951
Perceived Sensitivity	1.094	0.914
Perceived Severity	1.150	0.870
Cue to action	1.228	0.814
Perceived Benefits	1.076	0.929
Perceived Costs	1.295	0.772

Note: Tolerance=$\frac{1}{VIF}$

Table 8 shows the coefficients obtained from linear regression analysis.

Table 8. Beta coefficients (βs) of factors in predicting the types of behaviors and whole behavior

Factors	Behaviors			
	Protective Equipment[(a)]	Health protective behaviors[(b)]	Avoidance behaviors[(c)]	Whole BHV[(d)]
Attitude	0.015	0.037	− 0.013	− 0.013
SNs	0.228***	0.169*	0.186*	0.186***
PBC	0.456***	0.072	0.246***	0.246***
Behavioral Intention	0.019	− 0.074	− 0.091	− 0.091
Perceived Sensitivity	− 0.063	− 0.157*	0.069	0.069
Perceived Severity	− 0.090	0.118	− 0.191*	− 0.191*
Cue to action	0.022	0.144*	− 0.066	− 0.066
Perceived Costs	− 0.020	− 0.094	0.072	0.072
Perceived Benefits	− 0.047	− 0.060	− 0.045	− 0.045
Trust	0.018	− 0.079	0.047	0.047
(a) F(df = 10) =14.238, $p < 0.001$, $R^2 = 0.39$		(b) F(df = 10) = 2.60, $p < 0.01$, $R^2 = 0.12$		
(c) F(df = 10) =4.50, $p < 0.001$, $R^2 = 0.19$		(d) F(df = 10) = 12.68, $p < 0.001$, R2 = 0.19, $R^2 = 0.40$		

Note: * is significant at < 0.05, *** is significant at < 0.001

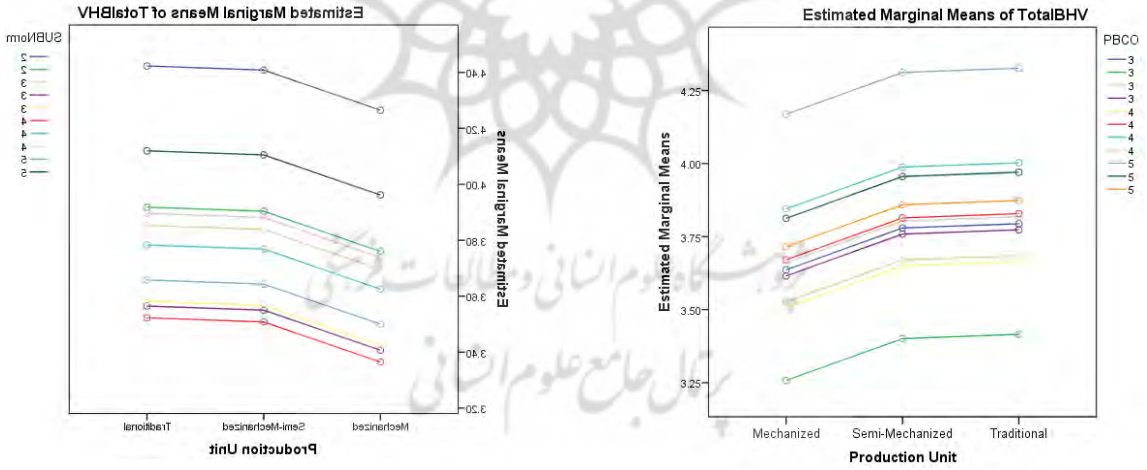
To test this hypothesis whether predictor variables interact with each other at different levels of the production unit (industrial, semi-industrial and traditional) or not, univariate GLM was used. This analysis answers the hypothesis that the values of variance explained by the health behavior of farmers in different levels of predictor variables are significantly different or not. Table 9 displays the result of the Tests of Between-Subjects Effects in GLM. As can be seen, the value of the F statistic in one-way ANOVA is significant for the two variables of SNs (F(df=9) = 4.843) and PBC (F (df=10) = 2.386). The estimated effect size in the GLM for the two variables of SNs and PBC is 0.374 and 0.245, respectively ($\eta 2_{SNs} = 0.374$; $\eta 2_{PBC} = 0.246$). Further, the interaction of SNs variable between the levels of the variable production unit is significant (i.e., SNs × Production Unit).

Table 9. GLM to examine the interactions of factors with the production unit in predicting BHVs

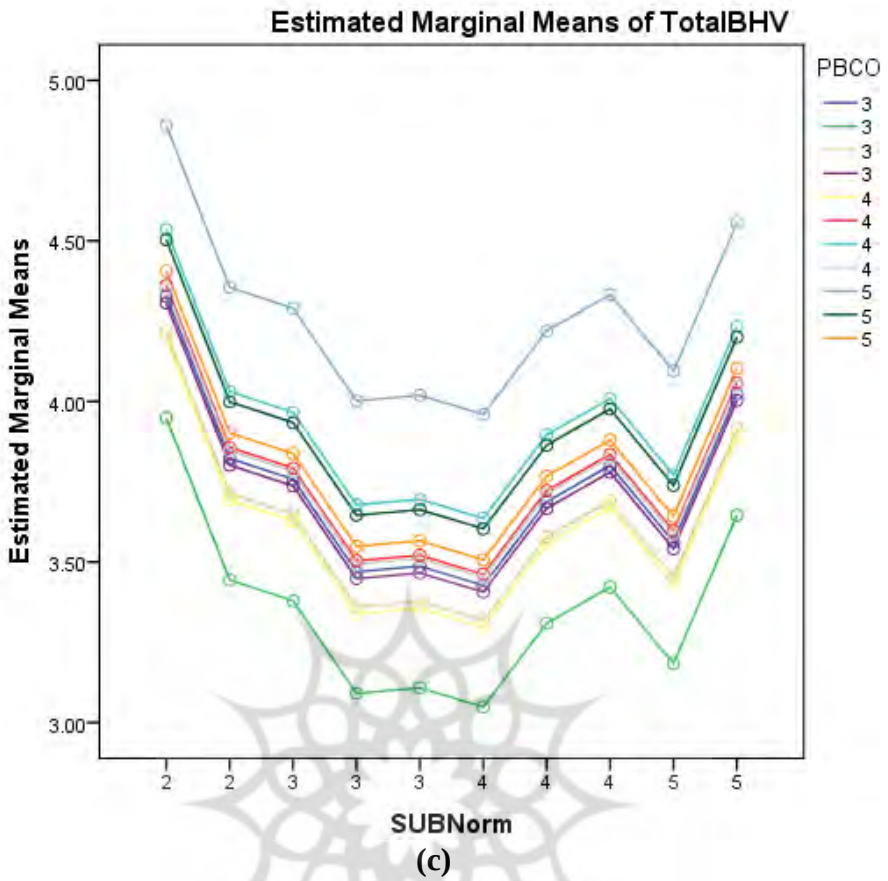
Variables	Type III[(a)]	F	Eta-squared (η^2)
Attitude	0.907	0.816	0.152
SNs	3.029	4.843***	**0.374**
PBC	1.658	2.386**	**0.246**
Behavioral Intention	0.722	1.299	0.125
Perceived Sensitivity	1.074	1.189	0.175
Perceived Severity	1.108	0.613	0.179
Cue to action	0.333	0.399	0.062
Perceived Costs	0.532	0.851	0.095
Perceived Benefits	0.554	0.613	0.098
Trust	0.409	0.736	0.075
SNs × PBC	3.07	1.14	0.28
SNs × Production Unit	**1.39**	**1.87**	**0.04**
PBC × Production Unit	0.80	1	0.45

Note: Eta-squared (η^2) statistics, was measured through $\eta^2 = \frac{SS_{between}}{SS_{total}} = \frac{SS_{between}}{SS_{total} + SS_{within}}$, with taking a root from η^2, the value of eta or the correlation ratio is calculated (Gray and Kinnear, 2012). The multiply symbol is a sign for "interaction." In this analysis, Type III Sum of Squares was used.

As shown in Figure 4, ranchers in the group of traditional production units have higher SNs compared to industrial and semi-industrial production units. This shows that the effect of SNs is more effective for sheep farmers with the traditional production units than the other two production units.



(a) **(b)**



(c)

Figure. 4. The illustration of interactions: (a) SNs × Production Unit, *p*-value < 0.05, (b) PBC × Production Unit, (c) SNs × PBC using GLM

5. Discussion and Conclusion

As the results showed, the SNs variable is one of the most remarkable determinants of anti- Covid-19 behaviors. Among the variables that make up the theoretical framework, this variable is one of the most important variables, where the constructs of HBM were not effective in accounting for anti-Covid-19 behaviors. This points to the significance of social and SNs in the formation of health behaviors and in the case Covid-19. As post-behaviorists analyze behaviors in the social and cultural contexts and do not regard behavior as a separate entity from their contexts. Therefore, this finding shows that friends and close and respected people of ranchers have a substantial role in the formation of preventive behaviors, due to the close and reciprocal interactions of ranchers, these people play an encouraging role to perform anti-Covid-19 behaviors and actions. It is noteworthy that due to the great publicity and variety of television and radio programs that play a role in republishing the condition of Covid-19 patients, they were somehow exposed to recovering from Covid-19 disease and the phenomenon of social interaction. One evaluates one's own behavior and that of others. Therefore, due to the acceptability of these people, ranchers approve of their recommendations and even avoid doing inappropriate things that spread the coronavirus, provided that people with high acceptance reject it, behaviors in favor of Covid-19. Much research and evidence show that SNs influence behavior. On the other hand, during the Covid-19 era, a large part of discussions, local dialogues, informal and formal dialogues, the text of organizational exchanged letters, policies, and a large part of media programs used the subject of Covid-19 disease. This would play a role in establishing the reality of Covid-19 disease as a dangerous and serious disease. The prevailing conditions in society have permeated all homes due to the use of mass media, and all citizens are involved in the coronavirus issue. Therefore, social norms would be an influential factor in the persistence of anti-Covid-19 behaviors. In general, the role of SNs, as a reminder and warning to ranchers by environmental social forces, is

significant. The results also showed that the values of social norm variables could affect the value of total behavior at different levels of the type of production unit. This shows that the relationships and interactions between traditional ranchers and friends and relatives are more dynamic and the social environment formed would lead to the creation of social norms that affect behavior. This finding is consistent with the findings of research like Garforth et al. (2013) and Velde et al. (2015).

The results also showed that PBC has a significant effect on livestock behaviors. The PBC is defined as the assessment of ranchers of the difficulty and being ease of the behavior of anti- Covid-19 measures. In this regard, PBC determines behavior, provided that this variable reflects the ranchers' actual control over the behavior; in other words, PBC could create a perceptible perception of work in the mental framework of ranchers. In addition, this perception is the result of the readiness of the environmental settings governing the production unit and the work organization, and beyond, the policy initiatives taken by the agricultural and veterinary sector, which could ultimately make the implementation of anti-Covid-19 behaviors and actions easier or more difficult. In this regard, past actions of ranchers in dealing with and managing previous diseases, such as brucellosis, malaria, and snow fever could, as their previous experience, form PBC, which expand or contract the anti-Covid-19 behaviors. The PBC consists of two components of belief in control and perceptual power, the former is the belief that there are factors that facilitate or prevent a particular behavior and the latter includes the perceived power to control each of these facilitators or deterrents. The effort expended by ranchers to perform anti-Covide-19 behavior is likely to increase as the perceptual PBC increases. The direct effect of PBC on behavior occurs when there is a correlation between the perception of control and the actual control of ranchers to perform anti- Covid-19 behaviors. According to the study, as derived from this study, the PBC affects anti-covid-19 behavior directly. Although PBC reflects farmers' confidence in their ability to perform anti-covid-19 behavior and is considered synonymous with Bandura's self-efficacy structure, PBC is a large part of Bandura's self-efficacy. In the comparison between perceived self-efficacy and PBC, it can be said that perceived self-efficacy is not based on people's beliefs about their abilities. This finding is harmony with the studies like Babaei et al. (2014), Karimi Aval et al. (2019), Masoudy et al. (2016), Khazaee-Pool et al. (2020), Velde et al. (2015).

The purpose of this study was to investigate the determinants of behaviors and preventive measures for Covid-19 disease. The results showed that the SNs have a positive and significant effect on Covid-19 management behaviors. A large and significant part of the SNs arises from information broadcasted by media to people who are respected and accepted by ranchers, which shape the realities of ranchers' life indirectly. The main platform for realizing these people is the information that is provided to the community by the media. Therefore, it is an important issue, explicitly suggested that to form anti-covid-19 facts, the media continue to cover the anti-covid-19 facts under reports of deaths, statistics, and adverse consequences of non-compliance with anti-covid-19 measures. These facts also indirectly affect the behavior of ranchers by retelling and reminding them through respected people. Therefore, it is recommended that the mass media republish the main facts about the dangers and harms of covid-19 disease. This in itself can be a fact for people accepted by farmers. Clearly, due to the effect of PBC on behavior, the respective institutions and departments, such as the veterinary network and farmers' organizations with the intervention of livestock cooperatives serve to increase the PBC of ranchers. In this case, training classes would increase the information and knowledge of farmers. Furthermore, by holding workshops and extension classes, it is possible to train farmers in the necessary skills for anti-covid-19 measures and transfer skills. On the other hand, by improving the skills of ranchers, they would gain the necessary confidence to implement the measures. It would be for planners, policymakers, and executives in the animal health sector to deliver health-driven assistance and financial support to ranchers to establish environmental contexts that facilitate ranchers' behaviors. Therefore, it would be important for ranchers to receive livestock subsidies to purchase Covid-19 controlling tools for ranchers through government support such as interest-free or low-interest loans.

This study faced with three limitations (1) lack of available scientific resources that have directly studied the preventive behaviors of ranchers. For this reason, more time would be needed to study articles and dissertations, which can affect the time

of the whole project. (2) Research projects in their various stages require the expenditure of financial resources, and financial constraints may delay and prolong the process of conducting research phases. (3) When ranchers have little information and the resources available to ranchers vary, in these situations, PBC may not predict behavior correctly.

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Authors' contributions

The authors equally contributed to the preparation of this article.

Conflict of interest

The authors declare no conflict of interest.

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Original Article

عوامل موثر بر رفتارهای پیشگیرانه مستمر گوسفندداران در برابر شیوع کووید-۱۹

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چکیده مبسوط

۱. مقدمه

تاکنون به صورت قطعی گزارشی مبنی بر ابتلای دام و طیور به ویروس کووید-۱۹ گزارش نشده و سازمان بهداشت جهانی صراحتاً انتقال این ویروس از دام به انسان و بالعکس را تأیید نکرده است؛ ولی این موضوع تحت پژوهش‌های گسترده قرار دارد. بیشتر تحقیقات در حوزه بیماری کووید-۱۹ توجه خود را روی الگوهای رفتاری شهروندان مقیم مناطق شهری به عنوان کانون قابل ملاحظه جمعیت انسانی قرار داده و توجه کمتری به رفتار افراد روستایی به عنوان مهمترین کُنشگران مرتبط با حلقه‌های ابتدایی زنجیره تولید و عرضه مواد غذایی دارند. در این میان، شناسایی دلایلی که نشان می‌دهد چرا تصمیمات دامداران همیشه تصمیمی نیست که به نفع سلامت مصرف کنندگان باشد، از اهمیت زیادی برخوردار است و چالش‌هایی را برای سیاستگزاران، دامپزشکان و متخصصان بهداشت عمومی ایجاد می‌نماید. سؤالی که مطرح می‌شود این است که چرا الگوهای رفتاری مبتنی بر بهداشت و به نفع سلامت در سطح واحدهای تولیدات دامی، جامع و فراگیر نیست؟ انجام رفتارهای پیشگیری و مراقبت‌های بهداشتی توسط دامداران در واحدهای تولید نقش مهمی در جلوگیری از شیوع، توسعه و فراگیری عامل بیماری کرونا دارد. در این راستا، تحقیقات بسیار اندکی پیرامون بررسی قصد و رفتار دامداران برای جلوگیری از شیوع بیماری کرونا انجام شده است. به همین دلیل، مطالعه حاضر به بررسی رابطه علّی عوامل مؤثر بر قصد و رفتار پیشگیرانه از شیوع و سرایت بیماری کرونا توسط دامداران مناطق کوه‌های سهند شهرستان مراغه می‌پردازد.

۲. مبانی نظری تحقیق

درک رفتار به عنوان یک کُنش قابل مشاهده، مستمر و در طولانی مدت به بحث منطق گرایی مرتبط می‌باشد. کشاورزان و دامداران رفتار و کاری را انجام می‌دهند که در شرایط خاص مزرعه، خانواده و تجارتشان برای آنها منطقی باشد. در حوزه بهداشت و سلامت، رفتار به کنش‌های مبتنی بر بهداشت و سلامت تکیه دارد. شناخت امنیت زیستی در واحدهای تولید راه جدیدی برای ایجاد انگیزه و تشویق کشاورزان برای مدیریت و مهار بیماری‌هاست. نگرش قضاوت‌ها و ارزیابی‌های مبتنی بر مطلوبیت و غیر مطلوبیت پیرامون اشیاء و موضوعات را شامل می‌شود. در حوزه سلامت و بهداشت دام، نگرش‌ها به دیدگاه‌های مبتنی بر اطلاعات آنلاین یا اطلاعات بازیابی شده از حافظه دامداران مربوط می‌شود که با در نظر گرفتن شرایط اقتصادی، فنّی و مالی مزرعه، می‌توانند ماهیت یک عامل بیماری‌زا، اقدامات تشخیصی یا درمانی نظیر اقدامات ضد ویروسی، ضد باکتریایی و ضد انگلی را ارزیابی کنند.

هنجار ذهنی ادراک فرد از اینکه دوستان نزدیک و مورد احترام وی تشویق کننده یا مانعی برای انجام رفتار وی هستند، تعریف می‌شود. شواهد حاکی از آن است که هنجارهای ذهنی شامل درک دامداران از آنچه که افراد مشهور و مقبولشان در شرایط مشابه انجام می‌دهند و درک آنها از موضوعات مهم است که نقش تعیین کننده در پذیرش اقدامات جهت مدیریت بیماری‌های انگلی دارد. تجربه نشان می‌دهد که رفتار مدیریت بیماری در بین دامداران تحت تأثیر ادراک آنها از کارآیی روش‌ها برای کاهش خطر بیماری، درک از توانایی آنها در کاربرد شیوه‌های خاص و درک آنها از عواملی که توانایی آنها را برای تأثیرگذاری عوامل خاص محدود می‌کند، است.

۳. روش تحقیق

پژوهش حاضر بر اساس طرح تحقیق، یک پژوهش توصیفی – همبستگی است. در این پژوهش از طرح تحقیق آمیخته اکتشافی برای ترکیب داده‌ها استفاده شد و با گردآوری داده‌های کمّی، نسبت به آزمون فرضیه‌ها اقدام شد. از بین دامداران شهرستان مراغه، با استفاده از جدول کِرجسی-مورگان با خطای حاشیه ۵ درصد به تعیین اندازه نمونه پرداخته نمود. برای انتخاب نمونه تحقیق از روش نمونه گیری تصادفی طبقه‌ای با انتساب متناسب با توجه به مناطق جغرافیایی شهرستان مراغه (بخش و دهستان) استفاده شد. در این پژوهش، از نرم افزار SPSS22 و AMOS20 برای تحلیل داده‌ها استفاده شد. روش‌ها و مدل‌های آماری جهت تحلیل داده‌های کمّی

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عبارتند از آزمون همبستگی پیرسون، آزمون تی استیودنت مستقل، تحلیل واریانس و تحلیل مسیر.

۴. یافته‌های تحقیق

نتایج مدل‌سازی خطّی تک متغیره نشان داد که متغیر هنجارهای ذهنی ($\eta 2_{SNs}$ =۰/۳۷۴) و کنترل رفتاری درک شده ($\eta 2_{PBC}$ =۰/۲۴۶) تأثیر قابل توجهی بر رفتار دارند. این دو متغیر در سه سطح نوع واحدهای تولیدی مکانیزه (n1=۲۷)، نیمه مکانیزه (n2=۴۷) و سنتی (n3=۱۳۳) مقادیر متفاوتی دارند. بعلاوه، بیشترین مقدار متغیر هنجار ذهنی و کنترل رفتاری به واحدهای تولیدی سنتی دام ارتباط دارد. بعلاوه، برهمکنش متغیر هنجار ذهنی و سطوح واحد تولیدی (SNs × Production Unit) از نظر آماری معنادار است ($\eta 2_{SNs}$ =۰/۳۷۴؛ F=۱/۸۷ ؛ $p < ۰/۰۵$). این یافته نشان می‌دهد که دوستان و افراد نزدیک و مورد احترام دامداران نقش مهمی در شکل‌گیری رفتار پیشگیری دارند. به دلیل تعاملات نزدیک و متقابل دامداران، این افراد نقش تشویق کننده برای انجام رفتارها و اقدامات ضد کرونا توسط دامداران دارند. نکته قابل توجه این است که به دلیل تبلیغات و تنوع زیاد برنامه‌های تلویزیونی و رادیویی که در بازنشر وضعیت و شرایط بیماران کرونا نقش داشتند، افراد را در معرض یادآوری لحظه‌ای از بیماری و پدیده کرونا هدایت می‌کرد و در تعاملات اجتماعی هر کسی رفتار خود و دیگران را مورد ارزیابی قرار می‌داد. بنابراین، دامداران توصیه‌های آنها را با توجه به داشتن مقبولیت این افراد تأیید و از انجام کارهای نامناسبی که موجود نشر ویروس می‌شود، پرهیز می‌کنند. در دوران کوید-۱۹، بخش قابل توجهی از بحث‌ها، محاوره‌های محلّی، محاوره‌های غیر رسمی و رسمی، متن نامه‌های رد و بدل شده سازمانی، سیاستگذاری‌ها و بخش عمده‌ای از برنامه‌های رسانه‌ای از موضوع «کرونا» استفاده می‌کردند. این موضوع می‌تواند در ایجاد واقعیت بیماری کرونا به عنوان یک بیماری خطرناک و جدی نقش داشته باشد. شرایط حاکم در جامعه نیز به دلیل استفاده از رسانه‌های جمعی به تمام خانه‌ها رسوخ کرده و همه شهروندان درگیر موضوع کرونا بودند. بنابراین، هنجارهای اجتماعی می‌تواند یک عامل برگذار در پایداری انجام رفتارهای ضد کرونا باشد. همچنین، متغیر هنجار اجتماعی می‌تواند در سطوح مختلف نوع واحد تولید روی رفتار دامداران تأثیر داشته باشد. در این راستا، هنجار ذهنی درک شده برای دامداران واحدهای تولید سنتی بیشتر از دو واحد مکانیزه و نیمه مکانیزه است. این نشان می‌دهد که روابط و تعاملات بین دامداران سنتی و دوستان و نزدیکان از پویایی بالاتری برخوردار است و محیط اجتماعی منجر به ایجاد هنجارهای ذهنی می‌شود که بر رفتار تأثیر می‌گذارد.

۵. بحث و نتیجه‌گیری

هدف از انجام این تحقیق، بررسی تعیین کننده‌های رفتارها و اقدامات پیشگیرانه ابتلا به بیماری کوید-۱۹ است. در ارتباط با تأثیر متغیر کنترل رفتاری بر رفتارها و اقدامات، پیشنهاد می‌شود که مروجان امور دام، آموزش‌های خود را با هدف بالابردن دانش و مهارت دامداران در حوزه اعمال رفتارهای ضد کرونا اعمال نمایند. در این راستا، تغییر نگرش و دیدگاه دامداران نیز عنصر مهمی است که احتمال بروز رفتارهای ضد کرونا را ارتقاء خواهد داد. مروجان و تکنسین‌های دامداری باید با برگزاری کلاس‌های توجیهی و ترویجی به انتقال دانش بهداشت دام به دامداران بپردازند و سطح یادگیری دامداران را ارتقاء دهند. از سوی دیگر، کنترل رفتاری با در اختیار گذاشتن منابع پولی برای دامداران ارتقاء می‌یابد. فراهم کردن امکانات و فناوری‌های مربوطه برای ارتقای سطح کیفی خدمات واحدهای تولیدی می‌تواند کنترل رفتاری را در دامداران ارتقاء دهد. در واقع، با مدیریت افکار، احساسات و رفتارهای دامداران، می‌توان به ارتقای سطح بهداشت واحدهای تولیدی و جلوگیری از سرایت عوامل بیماری زا در دوران کرونا و پساکرونا کمک نمود.

کلید واژه‌ها: رفتارهای پیشگیرانه، گوسفندداران، دامداران، شیوع، کووید-۱۹.

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