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Health Belief Model in Adopting Protective Behaviors Against COVID-19 in Iran

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Abstract

Background: Adoption of protective health behaviors is extremely important to prevent the coronavirus disease 2019 (COVID-19) outbreak.
Objectives: This study aimed to evaluate the influencing factors on adopting preventive behaviors during COVID-19 using health belief model (HBM) among the urban population in Maragheh, a city from North West of Iran.
Methods: We investigated 383 people via an online questionnaire from December 5 to 11, 2020. The validity of the questionnaire was confirmed with an experts' panel of 10 health professionals, and its reliability was 0.74 through Cronbach's alpha. Multiple regression analysis was conducted to analyze data.
Results: The self-efficacy (17.1 ± 2.5) and perceived benefits (5.7 ± 0.5) were evaluated at a high level. The health behavior was also appraised with a high mean score (21.2 ± 3.2). Among the components of the health belief model, perceived risk, self-efficacy, perceived benefits, and perceived barriers, and among demographic variables, gender and marital status were the predictors of protective behaviors against COVID-19.
Conclusions: Self-efficacy, perceived benefits, and perceived risk increased the incidence of protective behavior by 69% and 30%, respectively, and perceived barriers decreased it by 0.07%. Strengthening the ability to adopt protective behaviors and improving the public's perception of the effectiveness of these behaviors can be useful.

Keywords: Health Belief Model, COVID-19, Protective Behavior

1. Background

Health behaviors are defined as a set of measures that are taken by individuals aiming to maintain or improve health, reduce health problems, or achieve a balanced physical condition (1). The only current strategy to prevent coronavirus disease 2019 (COVID-19) infection is the adoption of protective health behaviors. Therefore, improving the health behaviors of the public is necessary (2).

There are several models for the examination of health behavior and its determinants, and it is important to use these models in the planning of health-promoting behaviors. The health belief model (HBM) is one of the oldest and most important models as a conceptual framework with many applications in the field of health behavior research. This model serves as a guide for designing health-related behavior interventions, (3) which was developed by public health researchers in the United States in the 1950s to enhance the effectiveness of health education programs (4).

The HBM assumes that health behaviors depend on a combination of various factors, especially perceived risk, perceived benefits, perceived barriers, cues to action, and self-efficacy (5, 6).

Based on the HBM, people should first feel threatened about the disease or health risk and take it seriously (perceived susceptibility), and then perceive the depth of risk and the severity of its consequences (perceived severity) using strategies or information sources that are formally designed and presented in society to support the performance of behaviors (cues to action). They also should believe in the effectiveness of protective behaviors (perceived benefits), and regard their benefits more than barriers (perceived barriers) to eventually adopt protective behaviors against COVID-19 (7, 8).

Self-efficacy refers to an individual's confidence in his or her ability to successfully perform a behavior, which was added to the HBM model in 1988 (7, 9).

Regarding the upward prevalence and mortality of COVID-19, the observance of health protocols and the adoption of preventive behaviors are necessary to control the disease. The implementation of the HBM framework in Maragheh to understand the relationship between HBM constructs and COVID-19 protective behaviors can provide local evidence for health policymaking and planning health education programs in the city. The results of this study can be cues to action for policymakers to be more informed in planning educational interventions to create / modify health behaviors.

2. Objectives

The current study was done to evaluate the influencing factors on adopting preventive behaviors during COVID-19 using HBM.

3. Methods

This research was a cross-sectional analytical study, which was conducted in urban areas of Maragheh from December 5 to 11, 2020. Maragheh is a city in the south of East Azerbaijan Province in Iran with an urban population of 177079. The calculated sample size was estimated to be 383 through the Cochran formula ($z = 1.96$, $d = 0.05$). The stratified random sampling method was used based on regional postal codes. First, 15 out of 31 postal districts were selected randomly from the suburb (low income) and other areas. Then, it was examined that these 15 districts include approximately 50% of the total urban area population, including the population of the suburb and other areas. Because this study was conducted online and there was a low probability of answering the questionnaire, the link of the questionnaire was sent to 10% of the mobile numbers of each postal district via short message services so that the response rate to the questionnaire would be at the desired level. For this purpose, the dedicated short message services of the Maragheh County Governor's Office were used along with social networks (WhatsApp and Telegram).

3.1. Inclusion and Exclusion Criteria

People were included if they were 16 years old or more, they had reading and writing skills, and had consent for participation in the study. Cases with lack of access to a smartphone or computer as well as lack of internet service and persons under the age of 16 (because parental consent was compulsory for this age group) were excluded.

The data collection tool was a researcher-made questionnaire, which consisted of three main parts. The first part of the questionnaire assessed respondents' sociodemographic information, and the second part was based on HBM.

The number of questions and scoring scale of each dimension of the HBM model in the questionnaire were as follows:

Perceived risk (3 questions, minimum and maximum scores of this dimension: 3 - 9, scores below 4 indicated low level, scores of 4 - 6 showed medium level, and scores above 6 indicated high level of perceived risk), cues to action (4 questions, minimum and maximum scores: 4 - 12, scores below 5 indicated low level, scores between 5 and 8 indicated medium level, and scores above 9 indicated high level), perceived barriers (4 questions, minimum and maximum scores: 4 - 20, scores below 12 indicated low level, scores 12 - 16 demonstrated medium level, and scores above 16 indicated high level), perceived benefits (2 questions, minimum and maximum scores: 2 - 6, scores below 3 indicated low level, scores 3 - 4 indicated medium level and scores above 4 indicated high level of perceived benefits), self-efficacy (4 questions, minimum and maximum scores: 4 - 20, scores below 12 indicated low level, scores 12 - 16 showed medium level, and scores above 16 indicated high level), and health behavior consisted of 5 questions, the minimum and maximum score was 5 to 25, which scores lower than 15 demonstrated low level of health behavior, scores 15 - 20 indicated medium level, and scores 20 - 25 showed high level of health behavior.

Health behavior was the dependent variable, which included hand hygiene, avoiding touching the face, covering the mouth and nose, keeping a physical distance from others, wearing a mask, a healthy lifestyle, etc.

The third section addressed information-seeking behavior (4 questions) and treatment-seeking behavior (2 questions). The questionnaire validity was confirmed by an experts' panel of 10 health professionals of health education and promotion, health economics, and health policy, and their comments on the simplicity, appropriateness, ambiguity, necessity, and scoring of the questions were applied. The average content validity index (CVI) and content validity ratio (CVR) values for the model dimensions were respectively 0.95% and 0.90%.

The questionnaire reliability was also estimated to be 0.74 through Cronbach's alpha. The data were analyzed by SPSS version 23. Descriptive statistics and multiple regression using the backward elimination method were used to analyze the data. The value of 0.05 was considered as a significant level.

3.2. Ethical Considerations

This study was approved by the Ethics Committee of Maragheh University of Medical Sciences (IR.MARAGHEHPHC.REC.1399.020).

4. Results

The participants in this study were 383 people. Regarding sociodemographic characteristics of the subjects, most of the respondents were in the age group of 33-45 years (36.1%), female (54.8%), married (75.5%), employed (68.5%), and with university educational level (61.4%). Examination of health behaviors revealed that the most of health behaviors observed by respondents all the time were covering the mouth and nose with a tissue when sneezing and coughing (95.1%), avoidance of touching face, eyes, and nose (89.5%), and keeping a distance of 1 to 2 meters from others (86.3%), respectively and the lowest percentage was related to wearing face masks (66.4%). The mean and standard deviation of the HBM structures as well as health behaviors associated with COVID-19 are illustrated in Table 1.

As can be seen in Table 2, the results of multiple regression analysis revealed that the HBM structures totally predicted 53.1% of health behaviors related to COVID 19 in the subjects. Moreover, the results indicated that perceived risk (β = 0.11), self-efficacy (β = 0.56), perceived benefits (β = 0.13), perceived barriers (β = -0.07), male gender (β = -0.08), and marital status (married people) (β = 0.07) were the predictors of protective behaviors against COVID-19. Self-efficacy and perceived benefits increased the incidence of the protective behavior by 69%, the perceived risk increased it by 30%, and the perceived barriers decreased it by 0.07%.

The perceived risk, perceived benefits, perceived barriers, and self-efficacy significantly predicted the health behaviors. The participants obtained high scores from self-efficacy, perceived benefits, and also health behaviors. At the same time, the mean scores of perceived risk, cues to action, information-seeking behavior, and perceived barriers were assessed as moderate.

5. Discussion

In our study, protective behavior was at the favorable level, which was consistent with the results of some previous studies (10, 11).

Self-efficacy and perceived benefits were the strongest predictors of protective behaviors, followed by risk perception and perceived barriers. Our findings are in line with those of two studies in Iran (12, 13). Alsulaiman and Rentner proposed self-efficacy, perceived barriers, and perceived benefits as key determinants of Middle East respiratory syndrome (MERS) prevention (14). However, on the contrary of the present study, Tang and Wong emphasized the crucial role of risk perception and cues to action in determining health behaviors against severe acute respiratory syndrome (SARS) (5). The results can be varied based on the study methodology, the target group, the type of disease and its severity, as well as the type of studied behavior (12).

Similar to previous studies (15-18), the present study presented that perceived risk can increase the preventive behaviors during the COVID-19 pandemic. However, these studies were different in terms of sample size, the target groups, study time, data analysis method, and type of model used.

According to the results, the mean score of perceived risk was assessed at a medium level, which was similar to the study conducted among Saudi students (19). However, other studies in Hong Kong (10), Iran (20), and Thailand (21) had contradictory results. The differences in risk perception can be due to demographic and socioeconomic disparities and, especially, different contexts of the study.

In the current study, people assessed the existing cues to action at the medium level. This component of the model was not a predictor of health behavior; Thus, educational interventions should focus on strengthening cues to action in the future. Moreover, particular attention should be paid to cues to action, including using the face mask, since based on the results, the use of face masks was the least common among the protective measures.

The most important perceived barrier in the present study was the high cost of using personal protective equipment, which was similar to some previous studies (12, 13, 22). Thus, the removal of environmental barriers to health behaviors, especially face masks, should be considered by local policymakers.

In the present study, amongst the sociodemographic factors, only two variables, gender and marital status, were the predictors of protective behaviors. Men were 54% less prone to health behaviors compared to women, which was consistent with results of other studies (10, 13, 18, 22) because women give more priority to their health and have more leisure time to spend on their health. Furthermore, married people were also 60% more interested in observing health protocols. The key strength of this study was using the HBM, which is an appropriate model for health behavior change, and its weakness was that all individuals from different sociodemographic groups and also rural residents were not surveyed; Therefore, it may not be representative of the whole society.

Table 1. Specifications of Different Components of the Health Belief Model

Variable	Variable Range	Mean ± SD	Level, No. (%)		
			Good / High	Medium	Week / Low
Perceived threats	3 - 9	6.8 ± 1.1	108 (31.5)	185 (53.9)	5 (14.6)
Cues to action	4 - 12	5.14 ± 2.1	104 (30.3)	161 (46.9)	78 (22.7)
Perceived barriers	4 - 20	14.48 ± 3.2	134 (39.1)	177 (51.6)	32 (9.3)
Perceived benefits	2 - 6	5.7 ± 0.59	324 (94.5)	16 (4.7)	3 (0.9)
Self-efficacy	4 - 20	17.1 ± 2.5	270 (87.7)	70 (20.4)	3 (0.9)
Health behavior	5 - 25	21.2 ± 3.2	223 (65)	101 (29.4)	19 (5.5)

Table 2. Results of Multivariate Regression Analysis to Determine the Effective Constructs of the Health Belief Model in Health Behaviors [a]

Predictor variables	B	SE	Beta	*t*	P-Value
Constant	0.11	1.6	4.1	2.5	0.01
Perceived risk	0.30	0.11	0.11	2.7	0.006
Self-efficacy	0.69	0.05	0.56	12.9	0.000
Perceived benefits	0.69	0.23	0.13	3	0.003
Perceived barriers	-0.07	0.03	-0.07	-1.9	0.05
Gender					
Male	-0.54	0.25	-0.08	-2.1	0.03
Marital status					
Married	0.6	0.293	0.07	2	0.04

[a] $R^2 = 0.531$, ADJ.$R^2 = 0.53$, R = 0.728.

5.1. Conclusions

The findings of this study can be used to prioritize health education interventions to prevent COVID-19. Strengthening the ability to adopt healthy behaviors and improving the public's perception about the effectiveness of health behaviors can have a significant impact on reinforcement of the behaviors. Increasing risk perceptions through providing statistics, information, and training should be focused on radio, television, and social media because people reported these media more useful.

Reducing the costs of personal protective equipment, especially masks, should be a public health policy in the city. It is suggested to focus on strengthening health behavior guides by providing more educational banners in the city and highlighting the role of health providers in making people informed about health behaviors.

5.2. Limitations

This study had potential limitations. First, it is possible that participants found the answers to some questions online before answering, which may cause bias in results (23). Second, there is the likelihood of sending a questionnaire to two phone numbers of one person. Third, we could not check what percentage of responders in each zone filled the questionnaire. Finally, only people who had access to smartphones and the Internet and also those who were educated participated in this study, which may cause selection bias, and the results cannot be generalized to illiterate people and those who did not have access to the Internet and mobile phones. However, due to the need to conduct the online study during the COVID-19 outbreak, there was we had to collect data using this method.

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Footnotes

Authors' Contribution: Study concept and design: S. S., M. SH, H. SH. Analysis and interpretation of data: S. S., A. T., and A. S. Drafting of the manuscript: S. S., M. SH., H. SH., and R.R. Statistical analysis: S. S, M.SH, A. S., and A. T.

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