



ORIGINAL ARTICLE

Predictors of the Social Distancing Behaviors during the COVID-19 Pandemic using Protection Motivation Theory in Iran: A cross sectional study

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Key words

Self-efficacy • Perceived severity • Intention, Behavior • Social Distancing • COVID-19

Summary

Background. Social distancing is a key behavior to minimize Coronavirus disease 2019 (COVID-19) infections. Since the change of behavior is the only way to prevent this pandemic, this study aimed to predict the social distancing behaviors during the COVID-19 pandemic using protection motivation theory (PMT).

Methods. This cross-sectional study was conducted through a convenience sampling method on 796 individuals over 15 years old from urban and rural areas of different cities in Iran during 2020. The data were collected online using demographic characteristics form, PMT and social distancing behaviors questionnaires. Afterward, the obtained data were analyzed in SPSS software (version 16) through linear correlation coefficient and hierarchical regression tests.

Results. The Mean \pm SD score of social distancing behaviors was obtained at 4.42 ± 0.31 . The results of the hierarchical linear

regression model showed that after adjusting the effect of socio-demographic variables, self-efficacy (Beta = 0.238, $P < 0.001$) was the strongest predictor of social distancing behaviors during the COVID-19 pandemic, followed by intention (Beta = 0.233, $P < 0.001$) and perceived severity (Beta = 0.083, $P = 0.028$). PMT constructs and intention was able to predict 40% of social distancing behaviors in total.

Conclusions. In the prevalence of infectious diseases, individuals differ in adherence to social distancing behaviors. The PMT was a useful framework for prediction social distancing behaviors during the COVID-19 pandemic. Therefore, this theory can be used as a framework in designing educational programs to increase self-efficacy and encourage individuals to observe social distancing behaviors as a result.

Introduction

The outbreak of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) that causes Coronavirus Disease 2019 (COVID-19) was first detected in Wuhan, China, in December 2019 and has since increased dramatically worldwide. The World Health Organization declared COVID-19 as an epidemic on March 11, 2020 [1]. The virus, which is usually transmitted through the respiratory droplets of infected people [2], is highly contagious, and its transmission rate is higher than that of the flu virus. SARS-CoV-2 can be transmitted by both symptomatic and asymptomatic individuals [1].

Global statistics indicate that this disease has spread rapidly in a short time so that many countries, including Iran, have been involved with the disease from the time of its outbreak (late December 2019) to the time of conducting this study (Jun 15, 2020). So to this day (11 Jan 2022), the number of confirmed infected cases and deaths caused by this disease has been estimated at 308,458,509 and 5,492,595 worldwide, respectively. Furthermore, the total number of confirmed infected cases and deaths caused by this disease has been estimated at 6,208,337 and 131,915 in Iran, respectively [3].

Considering the fact that no effective medication-assisted treatment or definitive vaccine has yet been developed for the new coronavirus [1], various countries have adopted non-pharmacological interventions to reduce virus transmission and contact levels in the population [4]. Social distancing is the most important advice to limit and delay the spread of the virus along with the basic hygiene recommendations, such as regular hand washing and the use of masks [5].

Social distancing is an important health-protective behavior [6] and one of the most effective measures in reducing viral pandemics, including COVID-19 [7]. It means staying away from the community, avoiding large gatherings, and keeping a distance from others (approximately 6 feet or 2 meters) if possible [8]. According to Imperial College London, social distancing occurs when all families limit their communication with communities outside the home, such as school and workplace by 75% [9].

Social distancing not only reduces the risk of infection among high-risk populations but also delays and reduces the size of the epidemic, which in turn eases the burden felt by health care systems and workers [2]. Furthermore, this approach has also been used as

an effective method to reduce the human-to-human transmission infection during previous epidemics [10]. After the outbreak of COVID-19, Iran the same as other countries also followed recommendations and instructions, such as closing schools and universities, mosques, shrines, Friday prayers, and cultural centers; reducing office hours; closing government jobs, except for essential jobs; restricting religious and cultural gatherings, as well as mourning and wedding ceremonies; and restricting/banning the movement of vehicles [11]. However, these recommendations were not observed by all the people.

The effectiveness of many non-pharmacological health measures depends on how people react to them [10]. Therefore, individuals' response and observation of social distancing recommendations is critical in controlling the spread of the COVID-19 virus and optimization of the outcomes during this pandemic [7]. In the confrontation with the prevalence of influenza, it is important to know the factors affecting the individuals' behavior in order to reduce the infection risk, transmission, and severity of the disease [12]. Knowledge about the psychological factors of behavioral responses to infectious diseases is also critical in shaping interventions during infectious disease epidemics [13]. Sociologists, psychologists, and anthropologists have proposed a range of different theories and models to explain the factors that affect behavior, especially health behaviors. Protection Motivation Theory (PMT) is one of the used theories for the evaluation of the factors that affect motivation and health behavior [14].

The PMT deals with the of risk perception in individuals and assesses the intention of individuals to take protective measures which are significantly affected by high levels of perceived risk [15]. In this theory, it is assumed that the acceptance of behavior and decision to participate in risk-preventing behaviors is based on the individuals' motivation to protect themselves against threats, such as epidemics [2, 9]. This theory includes two stages of threat appraisal and coping appraisal along with fear construct [16].

Threat appraisal is a cognitive process that people use to estimate the extent of a threat [2] and includes the perceived vulnerability (the individual's perception of his/her sensitivity to harm), perceived severity (the individual's perception of the severity of the potential harm) and response rewards (perceived benefits of the current methods) [2, 17]. Furthermore, coping appraisal, which refers to the assessment of an individual's ability to perform risk-preventive behaviors [2], includes self-efficacy (the individual's perception of his or her ability to perform behaviors), response efficiency (the individual's perception of the impact of recommended preventive behaviors on risk eliminating), and response costs (cost of performing the recommended behavior) constructs [2, 17].

The outcome of these two stages is protection motivation (protection intention) and behavior [16]. In other words, protection motivation is synonymous

with behavior intention and causes the stimulation or continuation of protective behavior. It also acts as an intermediary construct between the two stages (threat appraisal and coping) and protective behavior [17]. Several previous studies have investigated health-protective behaviors against the flu using the theory of protective motivation. In a study conducted in London (2012), the PMT was used to investigate the intentions to engage in protective behaviors (including social distancing) during a hypothetical influenza epidemic. According to the results of the study, the intention to stay at home during the epidemic (i.e., social distancing behavior) was associated with all PMT components. Moreover, self-efficacy was the strongest predictor of the intention to perform protective behaviors during a hypothetical epidemic [6]. In a study conducted in Scotland (2015), the results showed that PMT variables did not predict social distancing behavior in the computer game scenario. However, the three PMT components (i.e., fear, response efficiency, and self-efficacy) were important predictors of the intention to participate in social distancing [13]. Therefore, protection motivation theory provides a useful conceptual framework on the way individuals respond to a threat to their health. In other words, it leads to a better understanding of the predictors of protective behaviors in the face of the threat posed by epidemics, such as flu [12].

It should be noted that preventive behaviors is the most important issue in new influenza, and social distancing behavior is one of the most effective measures to reduce viral pandemics, including COVID-19. In addition, preventive and protective behaviors constitute the bases of PMT, and its constructs are oriented toward increasing the intention of preventive behaviors. Considering the fact that protective behaviors should be evaluated separately in each society and since predicting factors of social distancing behavior in COVID-19 has not yet been studied in Iranian society, this study aimed to determine predictors of social distancing behavior in response to the COVID-19 pandemic using protection motivation theory.

Methods

STUDY DESIGN AND SAMPLING

This cross-sectional study was conducted on urban and rural populations of different cities in Iran from Jun 15, 2020, to August 1, 2020. The sample size was estimated at 796 cases considering confidence level, power test, and small effect size of 99%, 95%, and 0.15, respectively. The sampling was performed using the convenience sampling method. Due to the pandemic nature of the disease and the presence of the disease in all the country provinces, the samples were collected from all over the country. The inclusion criteria were the age over 15 years, willingness to participate in the study, and residence in Iran.

DATA COLLECTION

The data were collected using online questionnaires sent to people in different cities through social networks, such as Telegram and WhatsApp, which were selected due to traffic restrictions in the country as a result of the COVID-19 outbreak. At the beginning of the questionnaire and before entering the statements page, the objectives of the study were briefly explained to the participants, and they were assured that their information will remain anonymous and confidential. Following that, the participants who agreed to attend the study were redirected to the statement page by clicking the "I agree" option.

MEASUREMENTS

1. Demographic characteristics form

This form covered such information as age, gender, marital status, place of residence, level of education, income level, social class, history of physical and mental illness, and knowledge of social distancing.

2. Protection Motivation Theory questionnaire

The PMT questionnaire is a researcher-made scale including six constructs and 39 statements and has been designed based on a 5-point Likert scale. The constructs of the questionnaire include:

- A) Perceived vulnerability: This construct consists of five statements and is rated on a 5-point Likert scale from 1=strongly agree to 5 = strongly disagree. It should be mentioned that one statement was scored in reverse.
- B) Perceived severity of the disease: This construct consists of seven statements and is rated on a 5-point Likert scale from 1 = strongly disagree to 5 = strongly agree. It should be mentioned that two statements were scored in inverse.
- C) Response rewards: This construct consists of four statements and is rated on a 5-point Likert scale from 1 = strongly agree to 5 = strongly disagree.
- D) Self-efficacy: This construct consists of seven statements and is rated on a 5-point Likert scale from 1 = strongly disagree to 5 = strongly agree. It should be mentioned that one statement was scored in reverse.
- E) Response efficacy: This construct consists of five statements and is rated on a 5-point Likert scale from 1 = strongly disagree to 5 = strongly agree.
- F) Response costs: This construct consists of six statements and is rated on a 5-point Likert scale from 1 = strongly agree to 5 = strongly disagree.
- G) Fear: This construct consists of five statements and is rated on a 5-point Likert scale from 1 = strongly disagree to 5 = strongly agree.

It should be noted that the mean score in each construct is obtained by adding the scores and dividing the sum by the number of the statements.

The validity of this questionnaire was assessed based on the content validity using both qualitative and

quantitative methods. In the qualitative method, the questionnaire was prepared using valid references and new studies. Afterward, 10 faculty members were asked to provide their corrective comments on the questionnaire. Furthermore, the coefficients of content validity ratio (CVR) and content validity index (CVI) were used to evaluate the content validity quantitatively. Following that, 10 experts were asked to rate each item based on a 3-point scale in which 3 = necessary, 2 = useful but not necessary, and 1 = not necessary to determine the CVR, and the responses were analyzed using the Lawshe formula. According to the Lawshe table of determining the minimum value, expressions with CVR numerical value higher than 0.62 (based on the evaluation of 10 experts) were preserved in this study [18, 19]. At this stage, by the removal of two items in the questionnaire, the number of items was reduced to 39. The CVI of the remaining items in this instrument was also calculated in this study. Regarding the Waltz and Bausell's CVI, three criteria of simplicity, specificity (relevance), and clarity were rated separately by 10 experts on a 4-point Likert scale in which 4 = completely related, 3 = related, 2 = somewhat related, and 1 = unrelated. Afterward, to calculate the CVI of each item, the total number of the experts that selected scores 3 and 4 (the highest scores) for that item was divided by the total number of the experts ($n = 10$). The criterion to accept the item was the attainment of the CVI score higher than 0.79 [19]. Accordingly, the items with a score below 0.79 were excluded from the questionnaire [20]. However, at this stage, all the items obtained a score higher than 0.79 and were maintained in the study. Regarding the reliability of the questionnaire, the internal consistency of the scale was determined by 20 respondents who were asked to complete the questionnaire. As a result, the reliability value of PMT questionnaire were confirmed by Cronbach's alpha coefficient of 0.86. In this study, an alpha value of 0.7 was considered appropriate.

3. Behavioral Intentions Questionnaire

This scale consists of five statements and is rated on a 5-point Likert scale from 1 = strongly disagree to 5 = strongly agree. It should be noted that the mean score in this questionnaire is obtained by adding the scores and dividing the sum by the number of the statements. The validity of the content of the questionnaire was confirmed using the opinions of 10 experts and its reliability was confirmed by calculating Alpha Cronbach 0.74.

4. Social Distancing Behaviors Questionnaire

The social distancing behaviors questionnaire lists 22 behaviors in line with social distancing recommendations prepared by the research team. Each behavior is rated on a 4-point Likert scale of 1 = never/rarely, 2 = sometimes, 3 = often, and 4 = always. The mean score in this questionnaire was obtained by adding the scores and dividing the sum by the number of the statements. The validity of the content of the questionnaire was

confirmed using the opinions of 10 experts and its reliability was confirmed by calculating Alpha Cronbach 0.82.

ETHICAL CONSIDERATIONS

The study was approved by the Ethics Committee of Gonabad University of Medical Sciences, Gonabad, Iran (Ethical code No: IR. GMU. REC.1399.045). The participants were assured of their voluntary participation in the study. Identity information, such as the respondents’ first and last names, was not asked to maintain confidentiality.

STATISTICAL ANALYSIS

All statistical analyses were performed using SPSS software version 16.0. Frequency (percent) and mean ± standard deviation (SD) were used to describe qualitative and quantitative variables, respectively. The normality assumption of quantitative variables was checked using the Kolmogorov-Smirnov test. The Spearman correlation test was used to assess the correlation between the PMT constructs and the social distancing behaviors. The hierarchical linear models were used to identify the predictors of the intention and also the behaviors concerned with social distancing during the COVID-19 pandemic based on the PMT constructs, after controlling for the influence of individual characteristics. For this purpose, the individual characteristics were entered in Block 1 and the constructs of the PMT were entered in Block 2 of the model. The assumptions of the linear hierarchical models, including normality, homoscedasticity of variance, and independence of the residuals were assessed using Kolmogorov-Smirnov test, plots of standardized residuals versus predicted values, and residual time series plot, respectively. The assumption of multicollinearity was also checked using the variance inflation factor (VIF). A two-tailed P-value of < 0.05 was considered statistically significant.

Results

CHARACTERISTICS OF THE PARTICIPANTS

A total of 796 Iranian people participated in the study, and completed the questionnaires. The mean age of participants was 36.9 ± 12.0, ranging between 16 and 80 years old. The other characteristics of the participants have shown in Table I.

THE CORRELATION BETWEEN THE PMT CONSTRUCTS, INTENTION, AND SOCIAL DISTANCING BEHAVIORS DURING THE COVID-19 PANDEMIC

The Spearman correlation test showed that there is a significant correlation between the PMT constructs, intention, and social distancing behaviors during the COVID-19 pandemic (all P-value is less than 0.001). The results have shown in the Table II.

Tab. I. Characteristics of the study participants.

Characteristics	N (%)
Gender	
Male	331 (41.6)
Female	465 (58.4)
Marital status	
Married	569 (71.5)
Single/widowed/divorced	227 (28.5)
Place of living	
City	699 (87.8)
Village	97 (12.2)
Educational level	
High school or below	163 (20.5)
Associate or Bachelor degree	401 (50.4)
Master degree or higher	232 (29.1)
Family income level	
Low	139 (17.5)
Moderate	591 (74.2)
High	66 (8.3)
Social class (subjective)	
Low	147 (18.5)
Middle	583 (73.2)
High	66 (8.3)
History of chronic diseases	
Yes	133 (16.7)
No	663 (83.3)
History of mental disorders	
Yes	17 (2.1)
No	779 (97.9)
The history of infection with COVID-19 in people around you	
Yes	130 (16.3)
No	666 (83.7)
The history of COVID-19 dying in people around you	
Yes	92 (11.6)
No	704 (88.4)
Information sources about COVID-19	
TV & Radio	294 (36.9)
Internet	374 (47.0)
Health staff	112 (14.1)
Urban advertising	9 (1.1)
Friends/relatives/neighbors	25 (3.1)

PREDICTORS OF THE INTENTION AND BEHAVIORS CONCERNED WITH SOCIAL DISTANCING DURING THE COVID-19 PANDEMIC

The assumptions of the linear hierarchical models, including normality, homoscedasticity of variance, and independence of the residuals were met. Also all the VIFs were less than 2.5 indicating that there was not serious multicollinearity between the predictors [21]. The results of the hierarchical regression model I (the outcome variable: intention) indicated that among individual characteristics, higher age (t = 3.395, P = 0.001), female gender (t = 2.167, P = 0.031), and having a history of chronic disease (t = 3.211, P = 0.001) had a significant positive association with the intention variable, and the variance explained by

Tab. II. Mean, standard deviation, and correlations between PMT constructs and social distancing behaviors during the COVID-19 pandemic.

Variable	Mean (SD)	Spearman correlation coefficientst								
		1	2	3	4	5	6	7	8	9
1. Perceived vulnerability	4.18 (0.65)	---								
2. Perceived severity	4.27 (0.58)	0.39	---							
3. Response Rewards	3.92 (0.76)	0.32	0.44	---						
4. Self-efficacy	4.12 (0.61)	0.38	0.46	0.50	---					
5. Response efficacy	4.56 (0.52)	0.30	0.41	0.29	0.52	---				
6. Response cost	3.80 (0.74)	0.24	0.35	0.51	0.52	0.36	---			
7. Fear arousal	3.71 (0.76)	0.13	0.37	0.24	0.21	0.27	0.22	---		
8. Intention	4.18 (0.67)	0.27	0.41	0.49	0.62	0.50	0.44	0.36	---	
9. Social distancing	4.42 (0.31)	0.55	0.69	0.74	0.75	0.61	0.70	0.54	0.75	---

SD: Standard Deviation; †For all P-value is less than 0.001.

the first step of the model (including the individual characteristics) was 10.1% (Adjusted R2 = 0.101). Taking into consideration of standardized regression coefficients (Beta), the most significant predictors of intention variables were age (Beta = 0.102), followed by history of chronic disease (Beta = 0.091), and gender (Beta = 0.058).

At step 2, the results showed that among the constructs of the PMT, four components including self-efficacy (Beta = 0.426, t = 12.338, P < 0.001), fear arousal (Beta = 0.177, t = 6.233, P < 0.001), response efficacy (Beta = 0.156, t = 4.912, P < 0.001), and response rewards (Beta = 0.155, t = 4.801, P < 0.001) were the most significant predictors of intention variables, respectively. According to the results, a change of one standard deviation in self-efficacy, fear arousal, response efficacy, and response rewards was associated with a change of 0.426, 0.177, 0.156, and 0.155 standard deviations of intention, respectively. With the inclusion of step 2 variables (PMT constructs) in the model, the variance explained was considerably increased from 10.1% to 55.1%, which was statistically significant (Adjusted R2 = 0.551, ΔF = 107.821, P < 0.001) (Tab. III).

The results of the hierarchical regression model II (the outcome variable: behavior) indicated that among individual characteristics, higher age (t = 2.845, P = 0.005), female gender (t = 10.139, P < 0.001), and college educational level (t = 2.877, P = 0.005) had a significant positive association with the social distancing behaviors, and the variance explained by the first step of the model (including the individual characteristics) was 16.8% (Adjusted R2 = 0.168). Based on the Beta values, the most significant predictors of behavior were gender (Beta = 0.317), followed by age (Beta = 0.100), and educational level (Beta = 0.087).

At step 2, the results showed that self-efficacy (Beta = 0.238, t = 5.427, P < 0.001), intention (Beta = 0.233, t = 5.474, P < 0.001), and perceived severity (Beta = 0.083, t = 2.203, P = 0.028) were the most significant predictors of behavior variables, respectively. According to the results, a change of one standard deviation in self-efficacy, intention, and perceived severity were associated with a change of 0.238, 0.233, and 0.083 standard deviations of behavior,

respectively. With the inclusion of step 2 variables (PMT constructs and intention) in the model, the variance explained was considerably increased from 16.8% to 40.0%, which was statistically significant (Adjusted R2 = 0.400, ΔF = 37.045, P < 0.001) (Tab. III).

Discussion

This study aimed to predict social distancing behaviors during the COVID-19 pandemic in Iranian society based on PMT. The results indicated a significant correlation between PMT constructs with social distancing intention and behaviors during the COVID-19 pandemic. Regarding the predictors of intention to perform social distancing behaviors during the COVID-19 pandemic, linear regression analysis showed that female gender, older age, and history of chronic disease were associated with the intention to perform social distancing behaviors. After controlling the effect of these variables, the results of the present study revealed that the four constructs of PMT, including self-efficacy, response efficiency, response rewards, and fear arousal, were significant predictors of the intention to perform social distancing behaviors.

According to the results of a study conducted in 2020, self-efficacy, response efficiency, response rewards, and perceived severity were important cognitive factors that motivate individuals to perform social distancing behavior, which is consistent with the findings of the present study [22]. The results of the present study were also in line with the findings of a study conducted in the United Kingdom (2015) which concluded that three PMT constructs (i.e., fear, self-efficacy, and response efficiency) were important predictors of the intention to participate in social distancing behaviors in the computer game scenario [13]. Furthermore, a study was conducted in Finland (2020) on voluntary PMT-based self-isolation during the COVID-19 pandemic. The results revealed that perceived severity and self-efficacy had a positive effect on self-isolation intention [23], which was consistent with the findings of the present study.

The findings of the present study indicated that fear was effective in the motivation or intention of individuals to preserve social distancing in the COVID-19 pandemic,

Tab. III. Hierarchical regression analysis predicting social distancing intention and social distancing behaviors by individual characteristics and PMT constructs.

Dependent Variable	Predictors	Beta	S.E.	t	P	Model Summary	
Model I							
Intention	Step 1	Age	0.102	0.002	3.395	0.001	R ² = 0.111 ΔR ² = 0.111 Adjusted R ² = 0.101 ΔF = 10.352 P < 0.001
		Gender: Female ^a	0.058	0.037	2.167	0.031	
		Educational level: College ^b	-0.011	0.044	-0.411	0.681	
		Place of living: City ^c	-0.024	0.053	0.911	0.362	
		Social class: Low ^d	-0.037	0.044	-1.456	0.146	
		Marital status: Married ^e	0.011	0.040	0.409	0.682	
		History of mental illness: Yes ^f	0.009	0.120	0.323	0.747	
	History of chronic disease: Yes ^f	0.091	0.051	3.211	0.001		
	History of infection with COVID-19 in people around the participants: Yes ^f	-0.029	0.047	-1.135	0.257		
	Step 2	Perceived vulnerability	-0.007	0.030	-0.247	0.805	R ² = 0.561 ΔR ² = 0.450 Adjusted R ² = 0.551 ΔF = 107.821 P < 0.001
		Perceived severity	0.002	0.038	0.052	0.958	
		Response Rewards	0.155	0.028	4.801	< 0.001	
		Response cost	0.019	0.028	0.604	0.546	
Self-efficacy		0.426	0.038	12.338	< 0.001		
Response efficacy		0.156	0.041	4.912	< 0.001		
Fear arousal	0.177	0.025	6.233	< 0.001			
Model II							
Behavior	Step 1	Age	0.100	0.001	2.845	0.005	R ² = 0.177 ΔR ² = 0.177 Adjusted R ² = 0.168 ΔF = 17.834 P < 0.001
		Gender: Female ^a	0.317	0.020	10.139	< 0.001	
		Educational level: College ^b	0.087	0.024	2.877	0.005	
		Place of living: City ^c	0.034	0.029	1.133	0.258	
		Social class: Low ^d	-0.041	0.024	-1.401	0.162	
		Marital status: Married ^e	-0.008	0.022	-0.241	0.810	
		History of mental illness: Yes ^f	0.020	0.065	0.640	0.523	
	History of chronic disease: Yes ^f	0.014	0.028	0.430	0.668		
	History of infection with COVID-19 in people around the participants: Yes ^f	-0.023	0.026	-0.791	0.429		
	Step 2	Perceived vulnerability	-0.019	0.016	-0.568	0.570	R ² = 0.414 ΔR ² = 0.236 Adjusted R ² = 0.400 ΔF = 37.045 P < 0.001
		Perceived severity	0.083	0.021	2.203	0.028	
		Response Rewards	-0.014	0.016	-0.362	0.718	
		Response cost	-0.019	0.016	-0.520	0.603	
Self-efficacy		0.238	0.023	5.427	< 0.001		
Response efficacy		0.061	0.023	1.626	0.104		
Fear arousal		0.050	0.014	1.491	0.136		
Intention	0.233	0.020	5.474	< 0.001			

Beta: Standardized coefficient; S.E.: Standard Error; ^a Reference category = Male; ^b Reference category = High school or less; ^c Reference category = Village; ^d Reference category = Middle or high; ^e Reference category = Single/widowed/divorced; ^f Reference category = No.

which in turn led to behavior change and adherence to social distancing. This finding is consistent with the results of other studies [13]. Fear is one of the first emotional reactions during an epidemic and acts as a defensive system in dealing with ecological threats [24, 25]. In the present study, self-efficacy was identified as the strongest construct related to intention. Therefore, if a person feels that she/he is able to perform a behavior and can overcome external influencing factors, his/her intention for social distancing will increase and she/he deals with the resulted problems and complications more easily. This finding was in line with that of previous studies on preventive behaviors in the case of an influenza pandemic, which indicated that perceived self-efficacy was the strongest predictor of the intention to stay at home out of other PMT constructs [6, 26].

In the present study, the total predictability rate of four constructs of the model (i.e., self-efficacy, response efficiency, response rewards, and fear arousal) for the prediction of the intention to perform social distancing behavior was estimated at 55.1%, indicating that PMT theory could serve as an appropriate model for the prediction of one's intention to perform social distancing behavior. The results of this study are consistent with those of another study in which the model was able to explain 55% of the interpersonal variance in the participants' motivation for performing social distancing behavior [22]. Regarding the predictors of social distancing behaviors during the COVID-19 pandemic, linear regression analysis in this study showed that among individual characteristics, female gender, older age, and higher

education level were significantly associated with the behavior, which was in line with the results of the previously conducted studies [27-29].

Considering the other predictors of social distancing behaviors during the COVID-19 pandemic and after controlling the effect of individual variables, the results of linear regression analysis showed that self-efficacy, intention, and perceived severity were significant predictors of social distancing behavior. The results of this study were in line with the findings of a study conducted in Japan (2020) which demonstrated that out of four PMT constructs, perceived severity and self-efficacy were significant predictors of staying at home and social distancing during the COVID-19 pandemic [28]. According to another study performed in 2020, self-efficacy, response efficiency, perceived severity, and vulnerability had a positive effect on adherence to social distancing [25]. In the same line, a study was conducted in 2015 to reveal whether or not PMT was a useful framework for understanding social distancing behavior in response to an simulated infectious disease epidemic. The study results indicated that PMT constructs did not predict social distancing behavior in the computer game scenario [2], which contradicts the results of the present study. The difference between the results of the two studies can be attributed to the real conditions of the disease in the present study, the high prevalence of the disease in Iran, and the fact that in a short time, a large number of people were hospitalized and many have died as a result of this infectious disease.

In present study, self-efficacy was identified as the strongest construct associated with performing social distancing behavior. This finding is consistent with the results of other studies in which self-efficacy was the most predictive variable for stay at home during the COVID-19 pandemic [28].

The intention is a mental state and involves a person's decision to act. Moreover, it is the last advisory step before performing a behavior and the most important cognitive predictor of behavior [4]. Studies have shown that although the intention is considered a good predictor of the person's behavior, and more intended individuals are more likely to perform a behavior, the intention does not always lead to engaging in a behavior. Furthermore, internal or external factors can change one's intention to perform a behavior over time, which should be considered for the promotion of the respective behaviors [28].

According to the findings of the present study, in order to transform the intention of social distancing into a behavior, one should focus on self-efficacy and perceived severity in individuals. Those who perceive COVID-19 as a severe illness with a high mortality rate and are also reported as having higher self-efficacy (e.g., they believed they could prevent infection) may be more motivated and engaged in preventative behaviors (i.e., social distancing) to minimize or eliminate the threats.

In the present study, the PMT constructs (self-efficacy and perceived severity) and intention can predict 40% of social distancing behavior in total, which indicates

that PMT theory can be used as a suitable model for the prediction of social distancing behaviors. According to another study conducted in 2020, the predictability of staying at home during the COVID-19 pandemic by the two PMT constructs (self-efficacy and perceived severity) was estimated at 21%, which was lower than that obtained in the present study [28].

This finding is important because significant behavioral changes are needed to slow the transmission of the virus during a pandemic [30].

Regarding the limitations of the present study, it should be mentioned that although a cross-sectional study was used to investigate the relationship between predicting variables and outcome at a specific point in time, longitudinal predictions could not be made in this study. Therefore, it is suggested that longitudinal research and randomized controlled studies be designed and implemented to investigate causal relationships in this field. Furthermore, the generalizability of the data in this study is affected by the fact that convenience sampling of available volunteers was conducted in a web-based approach in order to prevent the dissemination of the disease. Eventually, the assessment of self-reported behavior rather than measuring objective behavior was another limitation of the study.

Conclusion

According to the results of the present study, PMT is a useful model to explain the individuals' motivation to protect themselves against COVID-19 infection through social distancing. Furthermore, the PMT constructs (self-efficacy and perceived intensity) and intention were regarded as significant predictors of social distancing behavior during the COVID-19 pandemic. Therefore, the implementation of interventions to increase the perceived intensity of the disease and self-efficacy with the purpose to encourage people to adhere to social distancing behavior based on this theory can play an important role in slowing down or stopping the spread of COVID-19 in the long run.

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Conflict of interest statement

There are no conflicts of interest.

Authors' contributions

FHT, FM, ADN: Study conception and design. ADN,

FHT: Acquisition of data. FM: Analysis and interpretation of data. FHT, FM: Drafting of manuscript. FHT: Critical revision. All authors have read and approved the final manuscript.

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