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Original Article

Covid-19 Risk Perception in a Sample of Iranian Population

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Abstract: *How people behave in an emergency depends on many social, cultural, and contextual factors. This study aimed to determine the COVID-19 risk perception in Iranian people. This study was descriptive. The study population was the assistant of patients who had come to Baqiyatallah Hospital in 2021. The number of participants was 500. The study tool was the COVID-19 risk assessment questionnaire. Data were analyzed using SPSS-22 software. The mean risk perception score was 2.78(±0.6) on a 7-point scale. The lowest and highest mean of the predictors of risk perception in COVID-19 was trust in government and personal efficacy, respectively. There was a significant difference between men and women in the mean of collective efficacy (P= 0.032). Social knowledge (p=0.007), trust in science (p=0.001), and trust in medical professionals (p=0.050) in positive direct experience people were significantly more than in people with negative direct experience of COVID-19. The most important predictors of risk perception in the COVID-19 epidemic were gender, education, social knowledge, and trust in science (P<0.05). People's perception of the risk of COVID-19 depends on several various factors, the most important factors were gender, level of education, social knowledge, and people's trust in science.*

Keywords: *COVID-19; coronavirus; risk perception*

INTRODUCTION

The coronavirus disease 2019 (COVID-19) is caused by the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) and has spread around the world quickly, emerging as a significant challenge of the current century for public health, the economy, markets, and policies in many countries [1].

The coronavirus outbreak was declared a public health emergency of international concern by the World Health Organization on 30 January 2020. Today, most people around the world have understood the outcomes of COVID-19 infection and they have accepted the need for hand hygiene and social distancing to prevent its spread. But, some of them ignore or delay hygienic actions, government laws, and social distances in public places, or homes. The fact that individuals in the same situation of common challenge act so differently indicates that the persons' risk perception relating to this new and chronic challenge is strongly different [2].

How people behave in an emergency depends on their understanding of the severity and depth of the risk and the extent of their vulnerability, but many social, cultural, and contextual factors may influence their risk perception [3]. Little is known about how people perceive the risk associated with emerging infectious diseases compared to other areas of risk. Risk perception leads to the adoption of preventative health behaviors so misperception of COVID-19 risk in this condition can lead to negative consequences of pandemic control [4].

Personal experience with the virus, individualistic and prosocial values, hearing about the virus from friends and family, trust in government, science, and medical professionals, personal knowledge of government strategy, and personal and collective efficacy were all significant predictors of risk perception, in the first global assessment of public risk perception of COVID-19 [5].

Previous studies have examined differences in risk perception of COVID-19 in diverse populations and races. Health workers reported higher risk perception, level of worry, and knowledge as related to COVID-19 infection compared to the general population [6]. In some studies, females were found to perceive risks higher, complied more with the government's guidelines, and coped better than males in response to COVID-19 [7]. But Self-reported anxiety over the pandemic is a crucial predictor in explaining risk perceptions in all age and gender groups [8]. And overall public initial concerns and trust can play an essential role in improving the perceived risk of a pandemic and increasing public participation in adopting preventive measures [9]. This study aimed to determine the risk perception score and its related factor in Iranian people.

MATERIALS AND METHODS

This study was descriptive-analytical. The study population was the assistant of patients who had come to the clinic of Baqiyatallah Hospital in 2021. The inclusion criteria were 15 to 80 years old, no serious and acute illness, and consent to participate in the study. The number of participants in the study was 500, with a 5% alpha error and 20% beta error. The study tool was the COVID-19 risk assessment questionnaire, which was designed by Dryhurst [10] using previous studies to identify all dimensions of risk perception covering affective, cognitive, and temporal-spatial dimensions to provide a holistic measure of risk perception. The questionnaire included items on COVID-19 experience, demographic variables (age, gender, and education) knowledge, both personal and social knowledge, social amplification, prosociality, individualism, trust in l three domain of science, medical professionals, and government, personal efficacy, and collective efficacy. The validity of the COVID-19 risk assessment questionnaire was assessed using face and content validity approaches. The impact score of each item was assessed to evaluate the face validity. The questionnaire was distributed among 10 technical experts who were asked to evaluate items based on the mentioned criterion. Then the importance of each item was calculated using the impact score formula and the results were compared with the standard score (1.5), and items whose scores were higher than the standard score were included in the questionnaire. Next, the content validity of the instrument was analyzed using the Content Validity Ratio (CVR) and Content Validity Index (CVI). 10 respondent experts also participated in this phase. Experts were asked to group items as "essential", "essential but not useful", or "not essential" to calculate CVR. Their responses were calculated based on the CVR formula and the results were compared with Lawshe's Table. Numbers higher than 0.6 were approved. CVI survey was done based on the Waltz and Basel content validity index [11]. A questionnaire was distributed among the experts who were asked to rank 24 items based on a four-part Likert scale as compatible with 3 criteria of relevancy, simplicity, and clarity. (For example, unrelated items, partially related items, related items, and fully related items were scored 1, 2, 3, and 4, respectively). Items higher than 0.6 were approved according to the CVI score. Cronbach's alpha method was used to assess the questionnaire's reliability. Data collection was started after the standardization of the questionnaire.

Patients completed the study questionnaire, after written consent. The questionnaire was filled out using the interview method and by a trained interviewer. All information obtained from patients was confidential and the study received an ethics code from the ethics committee of Baqiyatallah Hospital. Primary data were analyzed using SPSS-22 software. Descriptive data analysis was performed using mean and standard deviation in quantitative data and frequency and percentage in qualitative data. Analytical analysis was performed according to the normality of the data with parametric and non-parametric tests. Linear and logistic regression were used to measure the relationship between variables according to the type of data.

RESULTS

The validity and reliability of the instrument of this study

In the first step, the COVID-19 risk assessment questionnaire was validated. Tables 1 and 2 show that the scores of all items of the questionnaire were higher than the criterion score (i.e. 1.5) and experts approved the quantitative face validity of all items. Moreover, the results of CVI indicate that all items of the questionnaire obtained a score higher than 0.6, and content validity was considered appropriate by experts. The reliability of the questionnaire based on Cronbach's alpha was 0.79, 0.69, and 0.77 for risk perception, individualism, and trust in science, respectively.

Study findings

In the study samples, 500 people participated, of whom 253 (50.6%) were women and 247 (49.4%) were men.

The mean age of participants was 38.9 (±11.7) and 147 (29.4%) of the people have experienced the disease. The descriptive characteristics are listed in Tables 3 and 4.

The mean risk perception score was 2.78(±0.6) on a 7-point scale. The lowest mean of the predictors of risk perception in COVID-19 was in trust in the government and the highest mean was in personal efficacy (Table 4).

Table 1: Results of calculating quantitative face validity (impact score) of items of the designed instrument

Item	Frequency	Importance	Impact score
Q1: How worried are you personally about the following issues at present? Coronavirus/COVID-19	0.7	4.4	3.08
Q2: How likely do you think it is that you will be directly and personally affected by the following in the next 6 months? - Catching the coronavirus/COVID-19	0.6	4.1	2.46
Q3: How likely do you think it is that your family and friends in the country you are currently living in will be directly affected by the following in the next 6 months? Catching the coronavirus/COVID-19	0.6	3.6	2.16
Q4: How much do you agree or disagree with the following statements? – The coronavirus/COVID-19 will NOT affect very many people in the country I'm currently living in	0.5	3.6	1.8
Q5: How likely do you agree or disagree with the following statements? - I will probably get sick with the coronavirus/ COVID-19	0.7	3.8	2.66
Q6: How much do you agree or disagree with the following statements? - Getting sick with the coronavirus/COVID-19 can be serious	0.6	3.3	1.98
Q7: How much do you feel you understand the government's strategy to deal with the coronavirus/COVID-19 pandemic?	0.6	3.5	2.1
Q8: To what extent do you think scientists have a good understanding of the coronavirus/ COVID-19?	0.5	3.6	1.8
Q9: Have you ever had, or thought you might have, the coronavirus/COVID-19?	0.6	3.1	1.92
Q10: Have you come across information about coronavirus/COVID-19 from: - Friends and family	0.6	3.4	2.04
Q11: To what extent do you think it's important to do things for the benefit of others and society even if they have some costs to you personally?	0.7	2.2	1.54
Q12: The government interferes far too much in our everyday lives.	0.8	2.6	2.2
Q13: How much do you trust the country's politicians to deal effectively with the pandemic?	0.6	2.5	1.5
Q14: How much do you trust each of the following? – Scientists	0.7	3.3	2.31
Q15: How much do you trust each of the following? - Medical doctors and nurses	0.6	3.2	1.92
Q16: To what extent do you feel that the personal actions you are taking to try to limit the spread of coronavirus make a difference?	0.6	3	1.8
Q17: To what extent do you feel the actions that your country is taking to limit the spread of coronavirus make a difference?	0.7	3	2.1

Table 2: Content validity index of questionnaires through CVR and CVI

Item	CVR	CVI		
		simplicity	perspicuity	relevance
Q1: How worried are you personally about the following issues at present? Coronavirus/COVID-19	1	0.9	0.9	0.9
Q2: How likely do you think it is that you will be directly and personally affected by the following in the next 6 months? - Catching the coronavirus/COVID-19	0.6	0.9	0.8	0.8
Q3: How likely do you think it is that your family and friends in the country you are currently living in will be directly affected by the following in the next 6 months? Catching the coronavirus/COVID-19	0.8	0.7	0.8	0.8
Q4: How much do you agree or disagree with the following statements? – The coronavirus/COVID-19 will NOT affect very many people in the country I'm currently living in	0.8	0.8	0.8	0.9
Q5: How likely do you agree or disagree with the following statements? - I will probably get sick with the coronavirus/ COVID-19	0.6	0.9	0.9	0.7
Q6: How much do you agree or disagree with the following statements? - Getting sick with the coronavirus/COVID-19 can be serious	0.8	0.8	0.8	0.7

Q7: How much do you feel you understand the government's strategy to deal with the coronavirus/COVID-19 pandemic?	0.9	0.8	0.7	0.9
Q8: To what extent do you think scientists have a good understanding of the coronavirus/COVID-19?	0.7	0.7	0.8	0.8
Q9: Have you ever had, or thought you might have, the coronavirus/COVID-19?	0.9	0.8	0.7	0.7
Q10: Have you come across information about coronavirus/COVID-19 from: - Friends and family	0.8	0.9	0.9	0.9
Q11: To what extent do you think it's important to do things for the benefit of others and society even if they have some costs to you personally?	0.6	0.7	0.8	0.7
Q12: The government interferes far too much in our everyday lives.	0.6	0.6	0.6	0.7
Q13: How much do you trust the country's politicians to deal effectively with the pandemic?	0.9	0.7	0.7	0.8
Q14: How much do you trust each of the following? – Scientists	1	1	1	0.9
Q15: How much do you trust each of the following? - Medical doctors and nurses	1	1	1	1
Q16: To what extent do you feel that the personal actions you are taking to try to limit the spread of coronavirus make a difference?	0.7	0.8	0.7	0.9
Q17: To what extent do you feel the actions that your country is taking to limit the spread of coronavirus make a difference?	0.9	0.7	0.7	0.9

Table 3: Descriptive characteristics of the participants in the study of risk perception of Covid-19

		Frequency	Percent
Gender	Female	253	50.6
	Male	247	49.4
	Total	500	100.0
Education	Under Diploma	37	7.4
	Diploma	149	29.8
	BSc	178	35.6
	MSc	91	18.2
	PhD	42	8.4
	Total	497	99.4
Direct experience with the disease	Yes	147	29.4
	No	353	70.6
	Total	500	100.0

Table 4: The scores of the risk perception questionnaire in participants in the Covid-19 risk perception study

		Number	Minimum	Maximum	Mean	Std. Deviation
Age		497	15	78	38.97	11.731
Risk perception		500	1	4	2.78	0.60669
Personal knowledge		500	1	7	4.78	1.50084
Social knowledge.		500	1	7	4.34	1.43105
Social amplification	Yes	426			85.2*	
	No	74			14.8*	
Prosociality		500	1	7	5.33	1.39061
Individualism		500	1	5	2.73	0.80308
Trust in government		500	1	5	2.20	1.071
Trust in science		500	1	5	3.73	0.73161
Trust in medical professionals		500	1	5	3.94	0.814

Personal efficacy	500	1	7	5.35	1.23006
Collective efficacy	500	1	7	4.02	1.20094

**: Percent*

Next, we ran a Spearman's rho to assess the correlation of the predictors that play a role in COVID-19 risk perception (Table 5). Social knowledge, trust in science, and trust in medical professionals were all significantly associated with risk perception refer to Table 3.

Table 5: The statistics of the predictors of COVID-19 risk perception

		Age	Risk perception	Personal knowledge	Social knowledge	Prosociality	Individualism	Trust in government	Trust in science	Trust in medical professionals	Personal efficacy	Collective efficacy
Age	Correlation Coefficient		.006	.000	.010	.092*	.030	.096*	-.005	.054	.006	.086
	Sig. (2-tailed)		.889	.999	.825	.040	.498	.033	.917	.229	.886	.055
Risk perception	Correlation Coefficient	.006		.044	-.266**	.009	-.078	.018	-.227**	-.156**	-.005	-.006
	Sig. (2-tailed)	.889		.329	.000	.833	.082	.694	.000	.000	.915	.891
Personal knowledge	Correlation Coefficient	.000	.044		-.061	.158**	-.218**	-.069	-.022	.100*	.296**	.069
	Sig. (2-tailed)	.999	.329		.171	.000	.000	.123	.618	.025	.000	.122
Social knowledge	Correlation Coefficient	.010	-.266**	-.061		-.028	.065	.026	.250**	.079	-.039	.097*
	Sig. (2-tailed)	.825	.000	.171		.532	.149	.567	.000	.076	.385	.029
Prosociality	Correlation Coefficient	.092*	.009	.158**	-.028		-.338**	-.031	.131**	.173**	.316**	.069
	Sig. (2-tailed)	.040	.833	.000	.532		.000	.486	.003	.000	.000	.125
Individualism	Correlation Coefficient	.030	-.078	-.218**	.065	-.338**		.052	-.061	-.134**	-.359**	-.122**
	Sig. (2-tailed)	.498	.082	.000	.149	.000		.243	.170	.003	.000	.006
Trust in government	Correlation Coefficient	.096*	.018	-.069	.026	-.031	.052		.088*	.074	-.022	.339**
	Sig. (2-tailed)	.033	.694	.123	.567	.486	.243		.048	.098	.623	.000
Trust in science	Correlation Coefficient	-.005	-.227**	-.022	.250**	.131**	-.061	.088*		.407**	.121**	.128**
	Sig. (2-tailed)	.917	.000	.618	.000	.003	.170	.048		.000	.007	.004
Trust in medical professionals	Correlation Coefficient	.054	-.156**	.100*	.079	.173**	-.134**	.074	.407**		.249**	.179**
	Sig. (2-tailed)	.229	.000	.025	.076	.000	.003	.098	.000		.000	.000
Personal efficacy	Correlation Coefficient	.006	-.005	.296**	-.039	.316**	-.359**	-.022	.121**	.249**		.277**
	Sig. (2-tailed)	.886	.915	.000	.385	.000	.000	.623	.007	.000		.000
Collective efficacy	Correlation Coefficient	.086	-.006	.069	.097*	.069	-.122**	.339**	.128**	.179**	.277**	
	Sig. (2-tailed)	.055	.891	.122	.029	.125	.006	.000	.004	.000	.000	

** Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).*

All predictors were analyzed based on gender variables (the Mann-Whitney U test was used due to abnormal distribution). There was a statistically significant difference between men and women in the mean of collective efficacy (P= 0.032) and the rest were not.

Specifically, people who have had direct personal experience of COVID-19 were different in some predictors of risk perception from those who had no direct experience of disease and social knowledge (p=0.007), trust in science (p=0.001) and trust in medical professionals (p=0.050) in positive direct experience people were significantly more than in people with negative direct experience of COVID-19.

We investigated the determinants of risk perception in regression models. The correlations of demographic variables with risk perception were assessed and gender, as well as education, were significantly associated with risk perception of COVID-19, such that males perceive less risk compared to females (Table 6) and the most important predictors of risk perception in COVID-19 epidemic were gender, education, social knowledge and trust in science (Table 7).

Table 6: Regression output of demographic variables of risk perception in COVID-19

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.991	0.142		21.078	0.000
	Age	-0.001	0.002	-0.017	-0.371	0.711
	Gender	0.115	0.055	0.095	2.081	0.038
	Education	-0.118	0.026	-0.205	-4.452	0.000

a. Dependent Variable: Risk perception

Table 7: Regression output of predictors of risk perception in COVID-19

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	4.141	.339		12.226	.000
Age	-.001	.002	-.018	-.419	.675
Gender	.116	.053	.096	2.187	.029
Education	-.111	.026	-.193	-4.219	.000
Personal knowledge	.021	.018	.053	1.181	.238
Social knowledge	-.099	.019	-.234	-5.303	.000
Direct experience	-.031	.058	-.024	-.544	.586
Social amplificatio	.033	.074	.020	.448	.654
Prosociality	-.001	.021	-.001	-.029	.977
Individualism	-.061	.037	-.081	-1.636	.103
Trust in government	.024	.026	.043	.935	.350
Trust in science	-.113	.042	-.136	-2.697	.007
Trust in medical professionals	-.068	.037	-.091	-1.843	.066
Personal efficacy	-.016	.025	-.033	-.661	.509
Collective efficacy	.017	.024	.033	.690	.490

a. Dependent Variable: Risk perception

DISCUSSION

Risk perception is important in determining health-protective behavior. Perception of risk in critical experiences like epidemics is influenced by social, cultural, and contextual factors. Previous experiences such as SARS, influenza, and swine flu epidemic showed that the strategies performed and the results of activities often depend on recognizing the predictors of risk perception and coordinating programs with the important predictors [12]. It should be considered the management of risk perception predictors directs by governments in all programs and activities. The risk perception model recommends in COVID-19 epidemics consist of clusters of variables that correspond to the cognitive tradition (e.g. people's knowledge and understanding of risks), the emotional and experiential tradition (e.g. personal experience), the social-cultural paradigm (e.g. the social amplification of risk, cultural theory, trust, and values), and relevant individual differences (e.g. gender, education, ideology). The mean risk perception score was 2.78(±0.6) in this study which is slightly different from the average risk perception score in other countries. The study of risk perception in ten countries found that the risk perception score of COVID-19 epidemics varied between 4.78 and 5.45 on a 7-point scale, and it is relatively high in countries of the U.K., Spain, and North America. Therefore, in this study, the score of risk perception was significantly lower than in all ten countries. High-risk perceptions may enhance the public's active response to the epidemic. Risk perception is a dynamic process and it changes over time. In this study, more than a year had passed from the beginning of the epidemic, which can be an influential factor in the perception of risk.

In demographic factors, gender was the significant predictor of risk perception. The risk perception score of women was higher than men on all the components of risk perception. Other studies reported the same result and it seems that gender was included as the moderator of risk perception and protective behavior [13]. In similar crises of the past decades, women are constantly seen to be more precautionary behaviors than their male counterparts. Another basic demographic predictor is the level of education of the individual, especially in positive experience persons. In other studies, a high level of educated is more likely to improve the preparedness level and adherence to COVID-19 preventive and control guidelines [14], and poor education was

significantly associated with lower risk perception [15], similar to our findings.

The level of education could affect knowledge as well as social knowledge; therefore social knowledge might be an important predictor of risk perception, which was observed in this study. Although studies on COVID-19 have reported associations between social knowledge and risk perception [16], some of them did not find this result [17]. Social knowledge is acquired through socialization and lived experience; however educational guidelines in the media at the national level could affect social knowledge, especially in critical situations such as the COVID-19 epidemic. The basic role of social knowledge in predicting the level of risk perception can be considered in the planning and implementation of national protocols.

This study found that scientific sources were the most trusted sources for COVID-19 information. Similar results were reported in Kwok's study on the COVID-19 pandemic [18] and the prior outbreak of SARS in 2003 [19] and the influenza A (H1N1) pandemic in 2009 [20].

Trust in science and experts in this study was greater than trust in government. The lowest mean of the predictors of risk perception was trust in the government. Trust in the government has been found to influence people's willingness to be accepting preventive activities [21], social limitations [22], and vaccination programs [23]. When people lack the necessary knowledge to evaluate the risk of a hazard, trust becomes an important cue regarding whom to believe and behavior [24]. People need to rely on scientists, professionals, and government agencies to listen and realize the information and the people's trust in these sources might be an important factor contributing to people's acceptance of the difficult precautionary measures needed to eradicate a pandemic [25].

This study might be consisting of some limitations. It should be noted that the study population was limited to those who were referred to the hospital. These people may not be a perfect example of the general population, and it is better to do such research at the national level and with diverse populations. The duration of the research was limited, and it is better to do this research several times.

CONCLUSION

People's perception of the risk of COVID-190 depends on several various factors, the most important of which were gender, level of education, social knowledge, and people's trust in science. It is recommended that studies be performed with larger and heterogeneous populations and longer time.

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