









Knowledge, attitudes, practices and fear of COVID-19 among Iranians: A quick online survey

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Abstract

To control COVID-19, several strategies were proposed in Iran since the start of the outbreak. The number of reported infected people and its consequent death toll herald relative inadequacies in the quality and extent of the measures in curbing the COVID-19 transmission cycle. This study was conducted to investigate knowledge, attitude, precautionary practices and degree of fear related to COVID-19 in a sample of Iranian population. This study was conducted among 457 residents of Kurdistan Province, Iran, through social networks and social media (WhatsApp and Telegram). Knowledge, attitude and practice and fear of COVID-19 were collected using valid tools. Multiple logistic regression and multivariate linear regression analyses were used to identify factors associated with binary outcome attitudes, practices and continuous variables knowledge and fear of COVID-19, respectively. The mean (*SD*) age of participants was 37.86 (10.42); of them, 252 (55.1%) were men, and more than two-thirds were married (74.8%). About 10% of the respondents were in believed that COVID-19 could create a type of social stigma. Level of knowledge about COVID-19 in 77.8% of the study attendees was acceptable, and 352 of them (70%) were confident that the virus would eventually be successfully controlled in the world, but only 252 of the attendants (50%) had confidence about successful control of COVID-19 in Iran. Applying multiple logistic regression, knowledge (OR: 1.18, $p = 0.028$) and fear (OR: 1.04, $p = 0.028$) of COVID-19 were associated with positive attitude towards controllability of COVID-19. Gender (OR: 1.96, $p = 0.012$), sources of information (OR: 5.00, $p = 0.005$) and knowledge (OR: 1.27, $p = 0.006$) were also indicated association with taking precautionary practices to control COVID-19. Further studies are recommended to boost level of knowledge, strengthen positive attitude and ameliorate behavioural pattern for successful control of COVID-19 in Iran.

KEYWORDS

attitude, COVID-19, fear, knowledge, practice

What is known about this topic?

- Diverse information exists about main contributing factors of COVID-19 prevention in different societies, and Iran is not exempt in this respect.
- People's knowledge, attitude and practice (KAP) are important precedents of COVID-19 related behavioural profile all over the world.
- Perceptions about presence of social stigma towards COVID-19-infected individuals may interfere with control measures in societies.

What this paper adds?

- Evidence-informed interventions are needed in Iran to boost level of knowledge, strengthen positive attitude and ameliorate behavioural pattern for successful control of COVID-19.
- Sources of uncertainty were identified about controllability of COVID-19 in Iran which warrant further exploration.
- The observed perception of stigma against COVID-19-infected individuals in this study must be investigated in diverse sociocultural context of Iranian population.

1 | INTRODUCTION

The respiratory infection which is called COVID-19 is an emerging viral disease that was first diagnosed in December 2019 in Wuhan, China (Zhu et al., 2020). Spread of the COVID-19 worldwide has led to announcement of pandemic emergency situation, and so far, more than 200,000 people have died globally due to COVID-19-related complications (World Health Organization, 2020b). The first approved COVID-19 case in Iran was reported from the city of Qom (the capital city of Qom province which is 126.29 km away from Tehran) on February 20, 2020. The infection quickly spread to all other provinces at next stage (Mounesan et al., 2020; National Committee on COVID-19, 2020) almost shortly after escalation of diagnosed cases in China (Lai et al., 2020; Omer et al., 2020). Increasing COVID-19-induced death toll around the world resulted in the declaration of the outbreak as a global emergency by the World Health Organisation (WHO) on March 11, 2020. The WHO also called on all countries to work closely for prevention of the viral disease and its brisk spread (Eurosurveillance Editorial Team, 2020).

COVID-19 is highly contagious and could easily transmit from an infected person to a healthy individual. The main signs and symptoms of COVID-19 include fever, dry cough, fatigue, muscle aches and shortness of breath. Asymptomatic infected people could transmit the virus during the incubation period which should vary from 4–5 days (95% confidence interval, 4–7 days) to 14 days (World Health Organization, 2018). Symptomatic patients could infect in general 1.2–2.5 of other people (Mahase, 2020). An adequate level of knowledge about the virus transmission routes and taking all recommended precautionary measures (i.e., maintaining social distancing especially from people at greater risk of infection including those with an underlying disorder) to prevent person-to-person infections are the key recommended requisites for the successful control of the COVID-19 (World Health Organization, 2020a).

Available scientific evidence suggests pivotal role of proper knowledge, positive attitude towards preventive measures and adherence to behavioural recommendations in prevention of COVID-19. Interventions that aimed at improving population level knowledge, attitude and practice (KAP) regarding the Middle East respiratory syndrome (MERS) were also suggested to be applicable strategies in prevention and control of COVID-19 (Alkot et al., 2016; Asaad et al., 2019). Based on the existent cumulative knowledge, having appropriate level of knowledge about COVID-19 is associated with more positive attitudes towards lifestyle changes for prevention of the infection (Zhong et al., 2020). Deficiency in knowledge and negative attitudes towards change that are pivotal for prevention of the disease were indicated to have association with a higher level of fear of COVID-19 (defined as a negatively valence emotion, accompanied by a high level of arousal) (Witte, 1998) and undermining efforts to prevent the spread of the disease (Hung, 2003). Previous studies showed that fear combined by efficacy messages or persuasive messages can be motivator attitude, intention and behaviour changes and hope as long as individuals believe they are able to protect themselves (Nabi & Myrick, 2019; Witte & Allen, 2000).

Disease pandemic in general could cause psychosocial stress due to felt health threats (Taylor, 2019), and the COVID-19 pandemic likewise was reported to induce anxiety (Jungmann & Witthöft, 2020) and psychological distress (Ahorsu et al., 2020; Gao et al., 2020; Gómez-Salgado et al., 2020; Huang & Zhao, 2020). Being female, poor self-rated health status and having non-specific symptoms of COVID-19 (coughing, sneezing) were also suggested to associate with greater psychological distress including higher levels of stress, anxiety and depression (Wang et al., 2020).

Cognitive factors such as overestimation about probability of infection or developing a serious illness, misinterpretations of body sensations/functions/appearance (as indications of serious illness) and disease-avoidant behaviours to prevent hospitalisation, meeting sick people, seeing blood along with planning for health check-up

and information seeking (via repeated medical consultations and tests, searches for information) can all prolong distress in health-anxious clients (Taylor, 2019). Health anxiety might lead to people's engagement in health-related behaviours such as controlling their body for symptoms and avoiding stressful situations.

In order to control COVID-19, several strategies including transportation restrictions, reducing working hours, staggering working hours on business centres and adopting distance working were proposed in Iran by the National Committee for Fighting COVID-19 (IRNCF COVID-19) since the start of the outbreak, and closure of schools and other public places and setting up hotlines to provide COVID-19-related information were other opted measures in Iran to alleviate the pandemic impacts. Inconsistent with this attempt, the number of reported infected people with COVID-19 and its consequent death toll in the country herald relative inadequacies in the quality and extent of the governments' measures in curbing the COVID-19 transmission cycle. This study was conducted to investigate knowledge, attitude, precautionary practices and degree of fear related to COVID-19 in a sample of Iranian population in order to probe into the limits and imperfections of the national-level strategies that had been implemented for COVID-19 preparedness.

2 | MATERIALS AND METHODS

2.1 | Design

This cross-sectional online survey was conducted on a convenient sample of 457 adult Iranians from 18 April to 19 May 2020.

2.2 | Data collection tools

2.2.1 | Participants' characteristics

The recruited study participants were asked to provide information about their age, gender, marital status (single or married), level of education (above high school versus below high school) and having a COVID-19-infected family member or friend (yes or no) and also their source of information about COVID-19 (television, Internet, friends and acquaintances, social media, comprehensive health centres and hospitals).

2.3 | Knowledge, attitude and practice

This 12-item scale designed by Zhong et al. (Zhong et al., 2020) was used to collect data about the respondents' COVID-19-related KAP. The items are answered on a true/false basis with an additional 'I don't know' option. A correct answer is assigned 1 point, and an incorrect/unknown answer is assigned 0 point. The total score ranges from 0 to 12, with higher scores indicating a better knowledge of COVID-19. The reported Cronbach's alpha coefficient for the original

scale was 0.71 (Zhong et al., 2020), and in the translated version of the instrument, it was estimated to be 0.75.

2.4 | The Fear of COVID-19 Scale

The Fear of COVID-19 Scale (FCV-19S) was developed by Ahorsu et al. and included seven items rated on a 5-point Likert-type scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) with minimum and maximum possible scores for each item in the range of 1–5, respectively. A respondent total score, therefore, could range from 7 to 35 by adding up the individual item scores with higher total score representing a greater amount of fear from COVID-19. The estimated Cronbach's alpha coefficient for the original scale was 0.82 (Ahorsu et al., 2020), and it was calculated as 0.80 in the Persian translated version.

2.5 | Sampling

Convenience sampling method was used to recruit the study sample in this Internet-based survey. Participation in the study was voluntary, and study purpose and procedures were sent to all invited people, and they were asked to give their informed consent before answering the scales' questions. The utilised medium for distribution of the questionnaires was WhatsApp and Telegram, and data collection was performed from 18 April to 19 May 2020 until reaching the predetermined sample size. While no statistical inference can be drawn on non-random sampling but to have as much as possible robust estimates of descriptive and statistical significance test results, a probability of 50.0% for having acceptable level of knowledge on and a positive attitude towards preventive measures against COVID-19 (Lemeshow et al., 1990) was assumed along with 95% confidence interval, estimate precision of 5%, design effect of 1.0 and a 15% dropout rate in calculation of the study sample size (442 participants).

2.6 | Data analysis

Measures of central tendency and variability were used to summarise and organise the study data. The applied statistical analysis techniques were also included one-sample Kolmogorov–Smirnov test to test normality of the data distribution, *t*-test and one-way analysis of variance (ANOVA) to compare knowledge and fear of COVID-19 scores among socio-demographic strata and chi-square test to determine the dependency of practice and attitude scores with socio-demographic status. To examine possible relationships between knowledge, fear of COVID-19 and socio-demographic status, backward multiple linear regression was utilised. To identify a set of best associated variables with COVID-19-related attitude and practice, backward elimination multiple logistic regression was performed. The level of significance was set as 0.05 in all the conducted

tests which were performed using the Statistical Package for Social Sciences v. 17 for Windows (SPSS Inc.).

3 | RESULTS

The mean (SD) age of the participants was 37.86 (10.42); of them, 252 were men (55.1%), and more than two-thirds were married (74.8%). Less than 10% of the study participants reported to have an education level below high school diploma, 23.6% disclosed to have at least a COVID-19-infected family member or friend, and less than 10% of the respondents proclaimed belief in the presence of stigmas associated with COVID-19 infection. Social media (WhatsApp and telegram) was reported by 42.2% of the participants to be their main source of information about COVID-19 (Table 1).

3.1 | Factors associated with knowledge related to and fears of COVID-19

The mean (SD) for knowledge score on COVID-19 was 8.66 (1.33) which showed significant association with gender (male versus.

female), level of education (above high school versus. below high school) and source of information (Comprehensive Health Services Centre [CHSCs] versus. Internet, social media or TV) ($p < 0.05$). Gender, level of education and having a COVID-19-infected family member or a friend were also recognised to have a significant association with fear of COVID-19 ($p < 0.05$) (Table 1). The mean and standard deviation of fear from COVID-19 scores in the whole sample were estimated to be 25.94 and 5.78, respectively (Table 1).

Outputs of the conducted multiple linear regression analysis were also indicative of association between age (β : 0.128, $p = 0.005$), gender (β : -0.115, $p = 0.012$), level of education (β : -0.156, $p = 0.001$) and source of information (β : -0.131, $p = 0.004$) with COVID-19 knowledge scores (Table 2).

3.2 | Factors associated with attitude and practice towards COVID-19

Belief in eventual controllability of the COVID-19 in the world was reported by 352 of the recruited people (70%), but only 252 (49.2%) of the attendees stated to have strong belief in controllability of

TABLE 1 Association between demographic variables, knowledge and fear of COVID-19

Variables	N (%)	Knowledge score		Fear score	
		Mean (SD)	p-Value	Mean (SD)	p-Value
Gender					
Male	252 (55.1)	8.52 (1.26)	0.018*	26.84 (5.38)	0.0001***
Female	205 (44.9)	8.82 (1.39)		24.63 (5.96)	
Marital status					
Single	115 (25.2)	8.46 (1.59)	0.063	25.23 (6.10)	0.181
Married	342 (74.8)	8.72 (1.22)		26.06 (5.61)	
Level of education					
Diploma below	37 (8.1)	7.81 (1.37)	0.0001***	26.07 (5.77)	0.006**
High diploma	420 (91.9)	8.73 (1.30)		23.37 (4.90)	
Did your family or friends infect with COVID-19?					
Yes	108 (23.6)	8.83 (1.26)	0.124	27.11 (5.57)	0.016*
No	349 (76.4)	8.60 (1.35)		349 (25.57)	
Is social stigma associated with COVID-19?					
Yes	30 (6.6)	8.60 (1.49)	0.797	25.0 (5.95)	0.357
No	427 (93.4)	8.66 (1.32)		26.0 (5.77)	
Which one is your information source about prevention of COVID-19?					
Internet	62 (13.6)	8.30 (1.57)	#0.0001	26.41 (5.79)	#0.071
Social medial	193 (42.2)	9.18 (1.14)		27.12 (6.02)	
Television	116 (25.4)	8.53 (1.23)		25.03 (5.76)	
Healthcare centres	86 (18.8)	8.61 (1.33)		25.80 (5.61)	
Total score	457(100.0)	8.66(1.33)		25.94(5.78)	

Note: p-value based on t-test, # based on one-way ANOVA.

* $p < .05$,

** $p < .01$,

*** $p < .001$.

Variables	Knowledge related to COVID-19			Fear of COVID-19		
	Beta	T	p-Value	Beta	T	p-value
Age	0.128	2.7	0.005	...	...	...
Gender (male versus. female)	-0.115	-2.5	0.012	0.203	4.4	0.0001
Level of education (high diploma versus. diploma below)	-0.156	-3.4	0.001	...	...	...
Did your family or friends infect with COVID-19? (yes versus. no)	...	...	...	0.092	2	0.045
Your source of information about COVID-19.(social medial [WhatsApp, Telegram] versus. healthcare centres, Internet and TV	-0.131	-2.8	0.004	-0.108	-2.34	0.02

Note: Based on backward elimination.

TABLE 2 Results of multiple linear regression on knowledge related to and fear of COVID-19

TABLE 3 Association between demographic variables, attitude and practice with COVID-19

Variable	Attitudes, n (%)				Practice, n (%)			
	Q1: final success in controlling		Q2: confidence of winning		Q1: going to a crowded place		Q2: wearing a mask	
	Agree	Disagree	Agree	Disagree	Yes	No	Yes	No
Gender								
Male	181 (71.8)	71 (28.2)	115(45.6)	137 (54.4)	94 (37.3)	158(62.7)**	185(73.4)	67(26.6)**
Female	139 (67.8)	66 (32.2)	110(53.7)	95 (46.3)	37 (18.0)	168(82.0)	175(85.4)	30(14.6)
Marital status								
Single	79 (68.7)	36 (31.3)	53(46.1)	62 (53.9)	33 (28.7)	82(71.3)	87 (75.7)	28 (24.3)
Married	241 (70.5)	101 (29.5)	172(50.3)	170 (49.7)	98 (28.7)	244(71.3)	273 (79.8)	69 (20.2)
Level of education								
Diploma below	29 (78.4)	8 (21.6)	23 (62.2)	14 (37.8)	10 (27.0)	27 (73.0)	28 (75.7)	9 (24.3)
High diploma	291 (69.3)	129 (30.7)	202 (48.1)	218 (51.9)	121 (28.8)	299 (71.2)	332 (79.0)	88 (21.0)
Did your family or friends infect with COVID-19?								
Yes	73 (67.6)	35 (32.4)	43 (39.8)	65 (60.2)	42 (38.9)	66 (61.1)**	86 (79.6)	22 (20.4)
No	247 (70.8)	102 (29.2)	182 (52.1)	167 (47.9)*	89 (25.5)	260 (74.5)	274 (78.5)	75 (21.5)
Is social stigma associated with COVID-19?								
Yes	20 (66.7)	10 (33.3)	15 (50.0)	15 (50.0)	8 (26.7)	22 (73.3)	24 (80.0)	6 (20.0)
No	300 (70.3)	127 (29.7)	210 (49.2)	217 (50.8)	123 (28.8)	304 (71.2)	336 (78.7)	91 (21.3)
Which one is your information source about prevention of COVID-19?								
Internet	43 (69.4)	19 (30.6)	25 (40.3)	37 (59.7)*	18 (29.0)	44 (71.0)	84 (77.4)	14 (22.6)
Social medial	133 (68.9)	60 (31.1)	82 (42.5)	111 (57.5)*	62 (32.1)	131 (67.9)	139 (72.0)	54 (28.0)
Television	83 (71.6)	33 (28.4)	71 (61.2)*	45 (38.8)	24 (20.7)	92 (79.3)	91 (78.4)	25 (21.6)
Healthcare centres	61 (70.9)	25 (29.1)	47 (54.7)*	39 (45.3)	27 (31.4)	59 (68.6)	82 (95.3)**	4 (4.7)

*p-Value based on chi-square test.

** $p < .01$.

COVID-19 in Iran. Women were more optimistic in this regard than their male counterparts. Gender, having a COVID-19-infected family member or a friend and source of information to prevent COVID-19 were identified as important determinants of COVID-19-related preventive behaviours ($p < 0.05$) (Table 3).

Based on the multivariate logistic regression analysis results, the participants' level of knowledge (OR: 1.18, $p = 0.028$) and fear of

COVID-19 scores (OR: 1.04, $p = 0.028$) were associated with their attitude towards overall controllability of COVID-19. Moreover, level of education (OR: 2.56, $p = 0.012$), having a COVID-19 infected friend or a family member (OR: 0.54, $p = 0.008$) and distinct level of knowledge about COVID-19 (OR: 1.39, $p = 0.008$) were identified to have association with belief in controllability of the outbreak in Iran (Table 4).

TABLE 4 Results of multiple logistic regression analysis on factors significantly associated with attitude towards COVID-19

Variable	OR (95% CI)	p-value
P1: final success in controlling (agree versus. disagree)		
COVID-19 knowledge score	1.18 (1.01, 1.37)	0.029
COVID-19 fear score	1.04 (1.00, 1.07)	0.028
P2: confidence of winning (agree versus. disagree)		
Level of education (high diploma versus. diploma below)	2.56 (1.22, 5.33)	0.012
Did your family or friends infect with COVID-19? (yes versus. no)	0.54 (0.34, 0.85)	0.008
COVID-19 knowledge score	1.39 (1.18, 1.63)	0.001

Note: Backward stepwise method.

3.3 | Factors associated with practice towards COVID-19

Gender (OR: 2.88, $p = 0.0001$) and having a COVID-19-infected family member or a friend (OR: 1.89, $p = 0.009$) were associated with the respondents' precautionary behaviour in avoiding presence in crowded places, but their mask wearing behaviour was associated with gender (OR: 1.96, $p = 0.012$), source of information (OR: 5.00, $p = 0.005$) and knowledge about COVID-19 (OR: 1.27, $p = 0.006$) (Table 5).

4 | DISCUSSION

The main purpose of this study was to investigate KAP and fear of COVID-19 in a sample of Iranian population during the outbreak. About 77.8% of the study participants were knowledgeable about COVID-19 with age, gender, general level of education and source of information being its important determinants in the studied group. Based on the findings, the attendees' attitude towards constructability of COVID-19 was associated with their knowledge and fear of COVID-19. Taking precautionary preventive actions by the study participants was recognised to be associated with their gender, source of information and knowledge about COVID-19, but their magnitude of fear from COVID-19 infection was significantly associated with gender, having a COVID-19-infected family member or friend with and source of information.

The reported level of knowledge about COVID-19 in this study is consistent with findings of previous studies (Abdelhafiz et al., 2020; Ahorsu et al., 2020). The COVID-19 pattern of morbidity and its associated death toll which is well reflected in the public media seem to have effect at least in short term on knowledge of the studied population sample. The perceived threat and seriousness of the disease with sensitising people and attracting their attention probably had greatest impact on the audiences' level of knowledge. The

TABLE 5 Results of multiple logistic regression analysis on factors significantly associated with practices towards COVID-19

Variable	OR (95% CI)	p-value
P1: going to a crowded place (yes versus. no)		
Gender (male versus. female)	2.88 (1.77, 4.60)	0.0001
Did your family or friends infect with COVID-19? (yes versus. no)	1.89 (1.17, 3.07)	0.009
P2: wearing a mask (yes versus. no)		
Gender (male versus. female)	1.96 (1.15, 3.24)	0.012
Your source of information about COVID-19 (healthcare centres versus. Internet, social media, WhatsApp, TV, Telegram)	5.00 (1.64, 15.29)	0.005
COVID-19 knowledge score	1.27 (1.07, 1.51)	0.006

Note: Backward stepwise method.

pronouncement is in line with the findings of previous research that indicated strong association between people's knowledge about an infectious agent that caused the outbreak and probability of taking precautionary preventive actions (Najimi & Golshiri, 2013; Vaughan, 2011). Public and social media generally play pivotal role in sensitising general populations about potential threat of an outbreak (Tang et al., 2018); therefore, their capacities should be utilised for control of the health-threatening infections.

During the COVID-19 outbreak in Iran, social media including WhatsApp and Telegram played a role in improving people's knowledge about preventing the disease and being familiar with the infection's signs and symptoms. The healthcare providers (HCPs) were the other source of information and consultation about COVID-19 and its culminated fear.

Gender was identified as an important predictor of knowledge about COVID-19 in this study. The finding is in agreement with the results of previous studies (Moran & Del Valle, 2016; Zhong et al., 2020). Women generally are more likely to use social media than men, and risk perception is usually higher in them (Acquisti & Gross, 2006; de Zwart, 2009). This is the main reason why women are more interested to seek health-related information and to pay more attention to outbreaks' threat.

People with higher level of general education in this study indicated better knowledge and understanding about COVID-19 threat which is line with findings of other studies (Abdelhafiz et al., 2020; Zhong et al., 2020). People with higher level of general education are typically more competent in accessing, searching and using social media and other information sources to find their required health information. Therefore, health education and enhancing knowledge and sensitivity of the people in the lower segment of education attainment might be challenging but crucial.

Social media such as WhatsApp and Telegram were reported by the study participants as their major source of information about COVID-19 which reflects relatively high penetration rate of the mentioned social media in the studied sample. The important role

social media can play in increasing public awareness about outbreaks and also in shaping the public opinion on spread and prevention of infectious agents as it was highlighted in previous studies (Lapointe et al., 2014). The role social media can play in preparing people for public health threats, and encouraging positive behavioural patterns among them was also pinpointed in earlier research (Merchant & Lurie, 2020).

Level of knowledge and fear of COVID-19 were associated with attitude towards overall controllability of COVID-19 in this study. Same finding was reported in a previous study indicating impact of having proper knowledge about COVID-19 on being optimistic about controllability of the disease and therefore being more prepared to follow instructions for prevention of its spread (Zhong et al., 2020). Dryhurst et al. also showed that people's desire to adopt preventative health behaviours during the COVID-19 outbreak is associated with their risk perception (Dryhurst et al., 2020). Level of fear about COVID-19 was recognised to be another important predicting factor of taking COVID-19-related precautionary measures by the study participants. Such a relationship was reported in previous research (Harper et al., 2020; Pakpour & Griffiths, 2020) and might be attributable to the impact of fear appeals on influencing people's attitudes, intentions and behaviours (Tannenbaum et al., 2015). The studied men indicated a higher level of fear about COVID-19 in this study which is in contrast with findings of another study in China (Liu et al., 2020) that reported a higher level of COVID-19-related fear among women and a higher probability of having posttraumatic stress symptoms (PTSS) in this gender group. The difference might be explainable by greater involvement of the Iranian men in social activities than women such as shopping, work-related activities and other role-dependent (as household provider role) activities, which might put them at greater risk of COVID-19 infection.

Fear of COVID-19 in this study indicated an association with using the social media as source of information. The relationship was also reported in a previous study (Gao et al., 2020). Misinformation that was spread in the social media about COVID-19 might be a source of unnecessary fear, anxiety and also stigma against the infected people; however, Choi et al. pointed out the positive impact of social media in forming risk perception during the MERS outbreak in South Korea (Choi et al., 2017). Interpretation of the study findings warrants further scrutiny due to several limitations such as non-random selection of the participants that prevent generalisability of the results, selection bias due to tendency of digitally competent people to participate in the study and reporting bias due to consideration the respondents might have in responding the study questions and therefore their attempt in reflecting a positive image of themselves about COVID-19-related knowledge and attitude.

5 | CONCLUSIONS

Further studies are recommended to boost level of knowledge, strengthen positive attitude and ameliorate behavioural pattern

for successful control of COVID-19 in Iran. Sources of uncertainty which was identified about controllability of COVID-19 in Iran and the observed perception of stigma against COVID-19-infected individuals in this study warrant further exploration and must be investigated in diverse sociocultural context of Iranian population.

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CONFLICT OF INTERESTS

The authors declare that they have no competing interests in this section.

AUTHOR CONTRIBUTIONS

EG and HM apprehended the idea. GM and RGG designed and analysed it. AS, AA, PS, BP and AMB interpreted the results and drafted the manuscript. All the authors take responsibility for the integrity of the work as a whole from inception to published article. All the authors read and approved the final manuscript.

ETHICAL APPROVAL STATEMENT

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional level and/or national level Medical Research Ethics Committee (MREC) and in line with the 1964 Helsinki Declaration and its later amendments. The ethical approval for the study conduct was obtained from the institutional Medical Ethics Review Board of Trustees (MERBoT) in the Kurdistan University of Medical Sciences (approval number: IR.MUK.REC.1399.123).









CONSENT FOR PUBLICATION

Informed consent was obtained from all individual participants included in the study.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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