

The Role of Public Trust and Media in the Psychological and Behavioral Responses to the COVID-19 Pandemic

Mohammad Reza Mohammadi¹, Hadi Zarafshan^{2*}, Sahar Khayam Bashi², Fatemeh Mohammadi³, Ali Khaleghi¹

Abstract

Objective: We investigated the level of psychological problems, perceived risk, safety behaviors, and the potential roles of demographic variables, public trust, media, and prior anxiety to illness during the COVID-19 pandemic among Iranians.

Method: In this cross sectional study, using a convenient and snowball sampling method, we distributed an online questionnaire to participants and collected data on their demographic variables, mental health status, the consumption of and level of trust to various media, the level of public trust, and perceived risk and safety behaviors regards COVID-19. Our final sample consisted of 1881 Iranian residents. We used descriptive analysis, bivariate correlation, univariable and multivariable linear regression analysis, and univariable and multivariable logistic regression analysis for data analysis.

Results: The mental health problems have increased in comparison to past national survey; 24.1% vs 10.39% for depression, 37.93% vs 16.7% for social dysfunction, and 41.33% vs 29.5% for anxiety, and 31.12% vs 29.08% for somatization. We also found high percent of acute stress 52.71% (95% CI: 50.45-54.96). Being female, married, and having a higher educational level increased the odds of safety behaviors. Public trust and national media can regulate the negative effect of the pandemic, while increasing perceived risk and appropriate safety behaviors can decrease psychological problems and disorders. However, social media increases perceived risk, safety behaviors, and psychological problems, especially severe acute stress.

Conclusion: We are in the early stages of the COVID-19 pandemic and its negative effects will increase. Many people have lost their relatives, their jobs, their social contacts, and are faced with a surge of negative news. Authorities should consider these critical issues and adopt appropriate communicative and supportive approaches to prevent their negative effects at both individual and societal levels.

Key words: Behavioral Response; COVID-19; Media; Psychological Response; Public Trust

The novel Corona Virus (COVID-19) was initially identified in China in November 2019 and spread around the world at a very fast pace (1, 2). Although its causes are not clearly known (2), we know that it transmits from human to human and remains on contaminated surfaces for a considerable time (3). Based on official reports of COVID-19, which are updated regularly, the number of new cases and deaths from infection are increasing globally (<https://coronavirus.jhu.edu/map.html>). It is now a universal disaster which have had negative effects on

many aspects of human life. Such a biological disaster, in addition to the direct physical harm for affected cases, has serious effects on daily living, social life, economic status, and psychological well-being of both affected and unaffected populations (4, 5). Several studies have confirmed the immediate and long-term psychological effects of outbreaks; for example, in the cases of influenza A (H1N1) (6), Zika virus (7), and Ebola (8), it was shown that they were related with increased level of anxiety, depression, distress and posttraumatic stress disorders.

1. Psychiatry and Psychology Research Center, Tehran University of Medical Sciences, Tehran, Iran.

2. Department of Autism and Neurodevelopmental Disorders, Psychiatry and Psychology Research Center, Tehran University of Medical Sciences, Tehran, Iran.

3. Department of Sociology, School of Social Sciences, Allameh Tabataba'i University, Tehran, Iran.

*Corresponding Author:

Address: Department of Autism and Neurodevelopmental Disorders, Psychiatry and Psychology Research Center, Tehran University of Medical Sciences, Tehran, Iran, Postal Code:1333795914.

Tel: 98-21 55421959, Fax: 98-21 55422002 Email: h-zarafshan@sina.tums.ac.ir

Article Information:

Received Date: 2020/06/16, Revised Date: 2020/07/03, Accepted Date: 2020/07/08

Although we are at the beginning of COVID-19 outbreak, Chinese researchers have conducted some studies regarding the psychological effects of this new pandemic on Chinese citizens. As suspected, COVID-19 increased the level of anxiety, depression, and sleep problems among Chinese population (9-11). Given this high coincidence and dual effect of psychological problems, as they themselves are significant impairments and important barriers to comply with safety behaviors, it is emphasized to integrate timely mental health care programs during the time of this pandemic (12, 13).

Pre and post psychological and behavioral responses to the disasters are influenced by characteristics of disasters, affected individuals, and societies. Health anxiety is a common term in pandemic studies which refers to "inappropriate or exaggerated concerns about health status" (14). It is shown that the level of health anxiety is significantly correlated with excessive safety behaviors and psychological problems, including anxiety disorders, depression, obsessive-compulsive disorder, and somatic symptoms (15). However, while it seems engaging in safety behaviors may reduce the psychological distress and risk of contamination (perceived or actual) in the short-term, it will increase mental health problems and dysfunctional behaviors (16, 17). Health anxiety is not a sole concept and is related to other individual and societal factors, such as age, sex, educational level, history of medical and or psychological problems, and risk perception, which are all important variables (7, 8 and 18). Moreover, access to related information, public trust, and social media are of equal importance (19-21).

Risk perception refers to personal judgment about a risky situation, including health threatening factors. It has 2 dimensions: (1) cognitive (people's knowledge about and understanding of risk) and (2) emotional (their feelings about what they know) (22). During pandemics, the magnitude of perceived risk is related to the people's knowledge about illness; however, it cannot be optimized by accessing actual scientific facts (7, 8). Risk characteristics and trust are also directly related to the level of perceived risk (22, 23). Public trust is another important concept which refers to what extent the society trusts the authorities in disease management (21, 23). The concept of public trust has 2 distinct components: trust in the competence and motives (24). Crisis in each of these components can negatively affect safety behaviors during pandemics (24). The higher the level of public trust in a society, the easier to manage the adverse effects of a pandemic, which is mainly controlled by taking safety measures such as handwashing, staying at home, and travel restriction (21, 24).

The public perception of risk and trustworthiness of authorities in risk management is greatly influenced by media, both directly and indirectly. The media's

approach to reflect the risks and media type influence public perception, especially among nonspecialists. For example, news media affect societal perceived risk and entertainment media affect personal perceived risk (22). Also, mental health problems are associated with social media; for example, Chinese researchers have found that high prevalence of mental health problems are positively associated with frequent exposure to social media during the COVID-19 outbreak (20).

However, current literature, which aims to provide valuable information in the understanding and managing risky situations including pandemics, have some important limitations that should be considered. For example, studies on predictors of health anxiety (7, 8) and psychological distress (25) mostly relied on small and nonrepresentative samples. Although the behavioral and psychological responses are related to different variables, they usually have not been investigated in a single study to determine the role of each group and their interactions.

Iran is among the countries affected by COVID-19 and we did not find any published report or article on the psychological reaction of Iranian society to the new outbreak. As Iran is in the middle of another crisis, US sanctions, which has negatively affected its economy and ability to access to many medical necessities, Iranian citizens are experiencing a much more critical and stressful situation. Therefore, exploring the psychological reaction of Iranian citizens to the COVID-19 pandemic and its predictors provides a good opportunity to better understand how pandemics affect psychological well-being and to find effective ways to prevent and manage their negative consequences. This study also investigates how the use of various media, including national media, foreign media, and social media, affect the odds of total susceptibility to mental problems. This paper aims to investigate the psychological and behavioral responses of Iranian citizens to the COVID-19 pandemic and to explore predictors to achieve understanding of how to optimize safety behaviors and psychological well-being during pandemics.

Materials and Methods

Design and Participants

This cross sectional study aimed at investigating the level of psychological problems, perceived risk, and safety behaviors and the potential roles of demographic variables, public trust, media, and prior anxiety to illness during COVID-19 among Iranian citizens in the first weeks of infection. To avoid the risk of infection and to increase the speed of data collection, using a convenient and snowball sampling method, we distributed an online questionnaire to participants and collected data about their demographic variables, mental health status, consumption and level of trust to media, the level of public trust, and perceived risk and safety behaviors

regarding COVID-19. Our target population was all Iranian citizens who potentially could receive and respond to our questionnaire. The data collection period was between March 5, 2020 to March 22, 2020. In sum, 4275 people received the questionnaire and 44%, (n = 1881) completed it, and sent it back. The respondents were from across the country.

As we could not find any questionnaire suitable for our study about public trust, consumption of and level of trust to the media, and perceived risk and safety behaviors regarding COVID-19, we developed 3 scales based on the literature .

Ethical Approval

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008. All procedures involving human subjects/patients were approved by the Institutional Review Board of Tehran University of Medical Sciences (approval number: IR.TUMS.VCR.REC.1398.1046).

Measurements

Demographics

Demographic questions included items about age, sex, educational level, marital status, living alone or not, feeling symptoms of COVID-19 in self, feeling symptoms of COVID-19 in relatives and friends, presence of positive cases of COVID-19 among relatives and friends, and having a high-risk medical condition.

Public Trust

Based on previous studies we have developed a 16-item scale to assess the level of citizens' trust to the motives, competence, and current activities of responsible authorities regarding COVID-19. We also asked about the overall trust of respondents to authorities. These items were confirmed by 5 specialists in the fields of psychiatry, psychology, sociology, and epidemiology. After initial analysis, we removed 3 items. The final scale includes 5 items about government, 5 about the Ministry of Health, and 3 about medical staffs. The overall internal consistency of items was equal to 0.935. Each item scored on a 5-point Likert scale from "1-very low" to "5-very much."

Media Consumption and Trust

We considered 3 different types of media: (1) national media (TV, radio, newspaper, or digital news channels, etc.), (2) foreign media (TV, radio, newspaper, or digital news channels, etc.), and social media (Instagram, WhatsApp, Telegram, Twitter, etc.). We asked 2 questions about each of them; for example, (a) during the past 2 weeks, to what extent did you obtain news and information about COVID-19 from national media? and (b) in general, how much do you trust national media?

Each item was scored on a 5-point Likert scale from "0-never" to "4-very much" ($\alpha = 0.6$).

Perceived Risks and Safety Behaviors

We have modified and extended items that were used in previous studies and developed a new 15- item scale. One item was removed after the initial analysis and the final scale included 3 items about perceived societal risk, 3 about perceived personal risk, 5 about avoidant behaviors, and 3 about preventive behaviors. Each item was scored on a 5-point Likert scale from "1-very low" to "5-very much". The overall internal consistency of items was equal to 0.82.

The 28-item General Health Questionnaire (GHQ-28)

The GHQ-28 has 4 subscales, each with 7 items that measure symptoms of somatization, anxiety, social dysfunction, and depression. In this study, the traditional scoring method was applied, giving 0-0-1-1 to choices of each question. The maximum score of participants is 28 in the questionnaire. The cutoff point used in this study was 6 for total score and 2 for each subscale. These cutoff points are based on standardization of this instrument in the Iranian sample (26, 27).

Short Health Anxiety Inventory (SHAI)

The SHAI contains 18 items that assess health anxiety independent from current health status. Items assess worrying about health, awareness of bodily sensations or changes, and fear of consequences of having an illness. The SHAI has demonstrated good reliability, criterion validity, and sensitivity to treatment (28, 29). We used the mean score of each subscale in our study.

Impact of Event Scale- Revised (IES-R)

The IES-R is a 22-item self-report measure to assess subjective distress caused by traumatic events. Respondents are asked to identify a specific stressful life event and then indicate how much they were distressed or bothered during the past 7 days by each "difficulty" listed. Items are rated on a 5-point scale ranging from 0 to 4. The IES-R yields a total score (ranging from 0 to 88) and subscale scores can also be calculated for the intrusion, avoidance, and hyperarousal subscales (30, 31). Based on the literature, by considering the cutoff score of 24, we can identify those persons who need more evaluation, and by considering the cutoff score of 33, we can identify those persons who have a high level of acute stress and need quick intervention due to being at a high risk to develop PTSD. We used cutoff score of 33 in our study.

Statistical Analysis

Statistical analysis was performed by STATA-14. We used descriptive analysis, bivariate correlation, univariable and multivariable linear regression analysis, and univariable and multivariable logistic regression analysis to analyze the data. We used "nestreg" command in STATA to clear the effect of each group of predictor variables (ie, demographic variables, public

trust, media related variables, and prior anxiety to illness).

Results

The total sample included 1881 Iranian citizens (see Tables 1 and 2). Among them, 65.39% were female and 34.61% male; and 83.46% aged 21 to 50 years.

As seen in Table 2, the mean of exposure to COVID-19 information from national media (EtNM) and exposure to COVID-19 information from social media (EtSM) were significantly greater than exposure to COVID-19 information from foreign media (EtFM) (mean difference = 1.08, $t(1880) = 27.58$, $p < 0.001$, and mean difference = 1.046, $t(1880) = 30.92$, $p < 0.001$, respectively). However, no significant difference was found between means of EtNM and EtSM (mean difference = 0.032, $t(1880) = 1.17$, $p > 0.05$). The mean of trusting medical staff (TtMS) was significantly lower than trusting foreign media (TtFM) and trusting social media (TtSM) (mean difference = -0.19, $t(1879) = -4.68$, $p < 0.001$, and mean difference = -0.39, $t(1879) = -11.17$, $p < 0.001$, respectively). Moreover, the mean of TtSM was significantly greater than TtFM (mean difference = 0.197, $t(1879) = 7.5$, $p < 0.001$).

Mental Health and Its Predictors

As seen in Table 3, we faced high level of mental health problems in our sample. The prevalence of general health problems, depression, social problems, anxiety, somatic, and acute stress were 38.51% (95% CI: 36.33%-40.73%), 24.1% (95% CI: 22.21%-26.08%), 37.93% (95% CI: 35.76%-40.14%), 41.33% (95% CI: 39.12%-43.57%), 31.12% (95% CI: 29.06%-33.25%), and 52.71% (95% CI: 50.45%-54.96%), respectively.

We estimated the odds ratios (OR) for the relationship between each mental health problem and their predictors, including demographic variables, variables related to media, public trust, and psychological sensitivity, to illness. Significant variables with regard to total susceptibility (ie, GHQ total score) were being female (OR = 1.728, 95% CI: 1.412-2.114), being married (OR = 0.657, 95% CI: 0.540-0.799), feeling symptoms in themselves (OR = 2.830, 95% CI = 2.241-3.573), and in relatives (OR = 1.916, 95% CI: 1.529-2.401), having heart disease and kidney disease (OR = 1.541, 95% CI: 1.104-2.152 and OR = 1.539, 95% CI: 1.049-2.257), exposure to COVID-19 information from national media (OR = 0.807, 95% CI: 0.684-0.953), trusting national media (OR = 0.669, 95% CI: 0.615-0.729), exposure to COVID-19 information from foreign media (OR = 1.150, 95% CI: 1.078-1.228), trusting foreign media (OR: 1.213, 95% CI: 1.113-1.322), exposure to COVID-19 information from social media (OR = 1.289, 95% CI: 1.150-1.444), trusting social media (OR = 1.268, 95% CI: 1.136-1.416). The total susceptibility was also correlated with the level of

trusting the government, the Ministry of Health, and the medical staff (OR = 0.61, 95% CI: 0.551-0.674, OR = 0.662, 95% CI: 0.605-0.724, OR = 0.857, 95% CI: 0.779-0.942)) and worry about health, awareness of bodily sensations or changes, and fear of consequences of having an illness (OR = 4.939, 95% CI: 3.924-6.216, OR = 2.425, 95% CI: 2.025-2.904, and OR = 2.897, 95% CI: 2.388-3.515).

Significant variables with regard to depression symptoms were being female (OR = 1.552, 95% CI: 1.230-1.959), age 51 to 60 years and over 61 (OR = 0.343, 95% CI: 0.160-0.738 and OR = 0.207, 95% CI: 0.067-0.637), being married (OR = 0.523, 95% CI: 0.421-0.650), living alone (OR = 1.095, 95% CI: 0.752-1.595), feeling symptoms in themselves (OR = 1.791, 95% CI: 1.397-2.296), and in relatives (OR = 1.535, 95% CI: 1.198-1.967). Exposure to COVID-19 information from national media (OR = 0.761, 95% CI: 0.637-0.910), trusting national media (OR = 0.494, 95% CI: 0.421-0.580), exposure to COVID-19 information from foreign media (OR = 1.242, 95% CI: 1.090-1.415), trusting foreign media (OR = 1.381, 95% CI: 1.192-1.600), exposure to COVID-19 information from social media (OR = 1.29, 95% CI: 1.007-1.653), and trusting social media (OR = 1.412, 95% CI: 1.191-1.675). Depression symptoms were also correlated with the level of trusting the government, the Ministry of Health, and the medical staff (OR = 0.564, 95% CI: 0.499-0.638, OR = 0.604, 95% CI: 0.544-0.672, OR = 0.809, 95% CI: 0.728-0.9)), and worry about health, awareness of bodily sensations or changes, and fear of consequences of having an illness (OR = 3.462, 95% CI: 2.776-4.319, OR = 1.801, 95% CI: 1.491-2.177, and OR = 3.110, 95% CI: 2.560-3.779).

Significant variables with regard to social problems were being female gender (OR = 1.438, 95% CI: 1.178-1.756), age 51 to 60 and over 61 years (OR = 0.40, 95% CI: 0.204-0.786), having symptoms themselves (OR = 1.798, 95% CI: 1.429-2.263), and their relatives' symptoms (OR: 1.458, 95% CI: 1.163-1.829), having gastrointestinal disease (OR: 1.392, 95% CI: 0.996-1.947), exposure to COVID-19 information from national media (OR = 0.775, 95% CI: 0.657-0.915), trusting national media (OR = 0.583, 95% CI: 0.510-0.667), exposure to COVID-19 information from foreign media (OR = 1.268, 95% CI: 1.132-1.421), trusting foreign media (OR = 1.319, 95% CI: 1.158-1.501), exposure to COVID-19 information from social media (OR = 1.652, 95% CI: 1.319-2.068), and trusting social media (OR = 1.394, 95% CI: 1.200-1.619). Social problems were also correlated with the level of trusting government, the Ministry of Health, and the medical staff (OR = 0.620, 95% CI: 0.560-0.685, OR = 0.689, 95% CI: 0.630-0.753, OR = 0.851, 95% CI: 0.773-0.935)) and worry about health, awareness of bodily sensations or changes, and fear of consequences of having an illness (OR = 2.560, 95% CI: 2.094-3.131,

OR = 1.686, 95% CI:1.420-2.003, and OR = 2.317, 95% CI: 1.929-2.784).

Significant variables with regard to anxiety were being female (OR = 1.833, 95% CI: 1.502-2.238), being married (OR = 0.817, 95% CI: 0.672-0.993), having symptoms in themselves (OR = 2.026, 95% CI:1.610-2.550), and in relatives (OR: 1.927, 95% CI: 1.538-2.414), having positive cases in relatives (OR = 1.344, 95% CI: 1.013-1.782), exposure to COVID-19 information from national media (OR = 0.851, 95% CI:0.722-1.004), trusting national media (OR = 0.618, 95% CI:0.542-0.704), exposure to COVID-19 information from foreign media (OR = 1.211, 95% CI:1.084-1.354), trusting foreign media (OR = 1.259, 95% CI:1.109-1.430), exposure to COVID-19 information from social media (OR = 1.513, 95% CI: 1.222-1.872), trusting social media (OR = 1.31, 95% CI: 1.131-1.518). Anxiety was also correlated with the level of trusting the government and the Ministry of Health (OR = 0.677, 95% CI: 0.615-0.746, OR = 0.717, 95% CI: 0.657-0.783), and worry about health, awareness of bodily sensations or changes, and fear of consequences of having an illness (OR = 4.862, 95% CI: 3.865-6.118, OR = 2.531, 95% CI: 2.112-3.035, and OR = 2.247, 95% CI: 1.870-2.700).

Significant variables with regard to somatic problem were being female (OR = 1.441, 95% CI: 1.167-1.779), being married (OR = 0.765, 95% CI: 0.623-0.940), having symptoms in themselves (OR = 5.0, 95% CI: 3.932-6.358), and in relatives and friends (OR = 2.111, 95% CI:1.677-2.657), having positive cases in relatives and friends (OR = 1.43, 95% CI: 1.069-1.914), age level 6 (OR = 1.490, 95% CI: 1.007-2.206), exposure with COVID-19 information from national media (OR = 0.916, 95% CI:0.770-1.091), trusting national media (OR = 0.789, 95% CI: 0.688-0.905), exposure to COVID-19 information through foreign media (OR = 1.052, 95% CI: 0.935-1.182), trusting foreign media (OR = 1.209, 95% CI:1.056-1.384), exposure to COVID-19 information from social media (OR = 1.438, 95% CI:1.140-1.814), and trusting social media (OR = 1.262, 95% CI = 1.080-1.476). The somatic problem was also correlated with the level of trusting the government and the Ministry of Health (OR= 0.801, 95% CI: 0.725-0.885, OR= 0.835, 95% CI: 0.763-0.915), and worry about health, awareness of bodily sensations or changes, and fear of consequences of having an illness (OR = 3.415, 95% CI: 2.756-4.231, OR= 1.975, 95% CI:1.650-2.364, and OR= 1.929, 95% CI:1.613-2.306).

Significant variables regarding acute stress were being female (OR = 1.730, 95% CI: 1.428-2.096), having symptoms in themselves (OR = 2.090, 95% CI: 1.645-2.655), and in relatives (OR = 1.458, 95% CI: 1.162-1.829), exposure to COVID-19 information from national media (OR =1.210, 95% CI:1.025-1.427), trusting national media (OR = 0.864, 95% CI: 0.763-

0.979), exposure to COVID-19 information from foreign media (OR = 1.235, 95% CI: 1.108-1.377), trusting foreign media (OR = 1.261, 95% CI:1.112-1.431), exposure to COVID-19 information from social media (OR =1.477, 95% CI:1.209-1.804), trusting social media (OR = 1.486, 95% CI:1.283-1.720). Acute stress was also correlated with the level of trusting the Ministry of Health and to medical staff (OR = 0.876, 95% CI: 0.806-0.951, OR = 0.874, 95% CI: 0.796-0.959) and worry about health, awareness of bodily sensations or changes, and fear of consequences of having an illness (OR = 9.344, 95% CI: 7.121-12.261, OR = 2.661, 95% CI: 2.208-3.206, and OR = 3.313, 95% CI: 2.669-4.113). Using different logistic regression analysis, we aimed to find the best predictor model for each psychological problem. We explored different models and selected the model which best fit both theoretically and statistically (Table 4). The final model for each problem and all included variables were statistically significant. The model summaries are as follow: LR $\chi^2(9) = 455.03$, $P < 0.001$, Pseudo $R^2 = 0.1816$ for total susceptibility; LR $\chi^2(9) = 340.57$, $P < 0.001$, Pseudo $R^2 = 0.164$ for depression; LR $\chi^2(7) = 241.54$, $P < 0.001$, Pseudo $R^2 = 0.0968$ for social problem; LR $\chi^2(6) = 360.76$, $P < 0.001$, Pseudo $R^2 = 0.1415$ for anxiety; LR $\chi^2(5) = 319.93$, $P < 0.001$, Pseudo $R^2 = 0.1372$ for soma; and LR $\chi^2(5) = 339.4$, $P < 0.001$, Pseudo $R^2 = 0.1691$ for acute stress.

Risk Perception and Safety Behaviors

At first, we used bivariate correlation analysis to examine the correlation between perceived societal and personal risk, safety behaviors (preventive and avoidant behaviors), and their predictor variables (Table 5). Then, we used multiple regression analysis to explore best predictors. We ran different models and selected the model which fitted best theoretically and statistically with our data. The final model for societal risk perception was statistically significant ($F(11, 1868) = 64.6$, $P < 0.001$) and can predict the odds of societal risk at a good level (R-squared = 0.276) (Table 6). The final model for personal risk was also significant ($F(10, 1869) = 65.63$, $p < 0.001$) at good level (R-squared = 0.26) (Table 6).

As seen in Table 7, the final model for avoidant behaviors was statistically significant ($F(9, 1871) = 17.98$, $P < 0.001$) and could predict the odds of avoidant behaviors at a weak level (R-squared = 0.08). The final model for preventive behaviors was also significant ($F(9, 1870) = 19.32$, $p < 0.001$) at weak level (R-squared = 0.085).

As the final models for avoiding and preventive behaviors were weak, we added societal and personal risk perception, which can affect the magnitude of safety behaviors to the models and reanalysis of the data. We called the new models as "B" models. As seen in Table 7, social risk remained in final "B" models and

increased R2 levels significantly to more than 0.14 for both models.

Table 1. Demographic Variables of Study Participants

Variable	N	Percent	P Value	Variable	N	Percent	P Value
Total sample	1,881	100					
Sex				Living Alone			
Male	651	34.61	p<0.001	No	1,725	91.71	p<0.001
Female	1,230	65.39		Yes	156	8.29	
Age				Feeling COVID-19 symptoms in past 2 weeks			
Under 20 years	42	2.23	p<0.001	No	1,512	80.38	p<0.001
21-30	390	20.73		Yes	369	19.62	
31-40	758	40.3		Feeling COVID-19 symptoms among relatives and friends in past 2 weeks			
41-50	422	22.43		No	1,493	79.37	p<0.001
51-60	210	11.16		Yes	388	20.63	
61+	59	3.14		Positive cases in relatives and friends			
Education level				No	1,661	88.3	p<0.001
Primary school	6	0.32	p<0.001	Yes	220	11.7	
Guidance school	32	1.7		Having high risk medical condition			
High school	29	1.54		No one	1,439	76.54	p<0.001
Diploma	216	11.48		Heart disease	78	4.15	
Post-Diploma	104	5.53		Kidney disease	27	1.44	
Bachelor degree	619	32.91		Diabetes	68	3.62	
Master Degree	547	29.08		Gastrointestinal disease	154	8.19	
PhD +	328	17.44		Respiratory and lung disease	114	6.06	
Marital Status							
Single	614	32.64	p<0.001				
Married	1,267	67.36					

Table 2. The Mean and Standard Deviation of Continues Variables (Predictors and Outcomes)

Variable	Mean	Std. Dev.	Min	Max
Worry about health (WaH)	0.817	0.493	0	3
Awareness of bodily sensations or changes (ABSC)	1.076	0.548	0	3
Feared consequences of having an illness (FCI)	0.671	0.534	0	3
Perceived societal risk (PSR)	4.062	0.758	1	5
Perceived personal risk (PPR)	2.910	0.901	1	5
Avoidant Behaviors (ABs)	4.593	0.625	1	5
Preventive Behaviors (PBs)	4.503	0.710	1	5
Trust to government (TtG)	2.135	1.023	1	5
Trust to ministry of health (TtMH)	2.602	1.095	1	5
Trust to medical staffs (TtMS)	3.758	0.975	1	5

Exposure with COVID-19 information from national media (EtNM)	3.490	0.997	0	4
Trust to national media (TtNM)	1.687	1.163	0	4
Exposure with COVID-19 information from foreign media (EtFM)	2.410	1.444	0	4
Trust to foreign media (TtFM)	1.880	1.096	0	4
Exposure with COVID-19 information from social media (EtSM)	3.457	0.867	0	4
Trust to social media (TtSM)	2.077	0.859	0	4

Table 3. Participants Scores on Mental Health Problems Scales during the COVID-19 Pandemic

	Frequency	Percent	Std. Err.	95% CI	Last survey (%)	%present survey / %past survey
Total susceptibility (GHQ-total) (suspected to have mental disorders)						
Score 6 and more	724	38.51%	1.12	36.33 40.73	23.44%	1.642
Score 5 and less	1,157	61.49%	1.12	59.27 63.67	76.56%	
Depression						
Score 2 and more	713	24.10%	0.99	22.21 26.08	10.39%	2.319
Score 1 and less	1,428	75.90%	0.99	73.92 77.79	89.61%	
Social dysfunction						
Score 2 and more	713	37.93%	1.12	35.76 40.14	16.70%	2.27
Score 1 and less	1,168	62.07%	1.12	59.86 64.24	83.30%	
Anxiety						
Score 2 and more	777	41.33%	1.14	39.12 43.57	29.50%	1.4
Score 1 and less	1,104	58.67%	1.14	56.43 60.88	70.50%	
Somatization						
Score 2 and more	585	31.12%	1.07	29.06 33.25	29.08%	1.07
Score 1 and less	1,296	68.88%	1.07	66.75 70.94	70.92%	
Acute stress (high risk of PTSD)						
Score 33 and more	991	52.71%	1.15	50.45 54.96		
Score 32 and less	890	47.29%	1.15	45.04 49.55		

Discussion

This cross sectional study aimed to investigate psychological and behavioral responses of Iranian citizens during the early stages of COVID-19 pandemic with respect to public trust and media exposure .

Our findings show the proportion of mental health problems increased from a past national survey with similar scale (ie, GHQ-28); 38.51% (in our study) vs 23.44% (in last survey) for total susceptibility, 24.1% vs 10.39% for depression, 37.93% vs 16.7% for social dysfunction, 41.33% vs 29.5% for anxiety, and 31.12% vs 29.08% for somatization. Our study also shows a large proportion of acute stress and high risk of developing PTSD; 52.71% (95% CI: 50.45-54.96) of our sample scored equal or more than 33 in IES-R, which based on the literature, shows those persons who have high levels of acute stress and need quick intervention due to being at high risk to develop PTSD (30). Our findings are in line with previous studies which showed

mental health problems are a major consequence of pandemics as important biological disasters (4, 6). As expected, acute stress (52.71%) and anxiety (41.33%) were most prevalent in our sample; these are common psychological reactions at the early phase of the disasters; however, depression and PTSD are dominant in later phases (32). It seems psychological distress is a common response to pandemics (33) and we can say that some level of anxiety and stress is crucial to following safety recommendations (22); however, its severity and durability could be problematic .

Our findings, using univariate regression analysis, showed problematic levels of psychiatric symptoms are related to different variables, including demographic factors, public trust, media- related variables, and prior anxiety related to illness. For example, in terms of demographic factors, being female, living alone, feeling symptoms in self and relatives, presence of positive cases in relatives, having heart disease and kidney

disease are significantly related with increased odds of mental health problems. However, being married and being over 50 years decreased odds of mental health problems. These findings are in line with previous studies (33, 34). Based on the health belief model (HBM) (35), feeling the presence of symptoms in the self and relatives (subjective or real), having high-risk medical condition and positive cases around enhance the psychiatric symptoms by increasing the sense of hazard. Finding about the effects of media, public trust and prior anxiety related to illness are almost consistent for all outcome variables. Exposure to and trust to national media decreased the odds of developing mental health problems; conversely, exposure to and trust to foreign media and social media increased the odds of developing mental health problems. For example, for each increase of 1 score in exposure to and trust to national media, there are 19.3% and 33.1% decrease in odds of total susceptibility (GHQ total), respectively. However, for each increase of 1 score in exposure to and trust to foreign Persian language media, there are 15% and 21.3% increase in odds of total susceptibility, respectively. They are equal to 28.9% and 26.8% increase in odds of total susceptibility for exposure to and trust to social media, respectively. This is the same pattern for all outcome variables except the odds of acute stress which increase 21% by each 1 score increase in exposure to national media. As mentioned previously, the way media reflects risky situations is very important. The difference between national media and social media can be justified by this notion; however, both types of media mention the risks of pandemics. National media focused on symptoms and education, but social media focused on consequences. Also, the data shared in social media are mostly unregulated and affected by users. There is another significant distinction between information spreading pattern of national, foreign Persian language and social media. Almost all foreign media that Iranian citizens had encountered were in foreign- based Persian language media. Such media are usually managed by groups opposing the Iranian government and thus focus on negative news about Iran including the shortages and inefficacy of government policies. For example, when at the beginning of the new pandemic, the deputy health minister of Iran, declared he was infected, foreign Persian language and social media maneuvered on it as a fact of the government's inability to control the infection, while after a short time many top ranked politicians from Western countries revealed they were infected without such stigmatization. Based on the Extended Parallel Process Model (EPPM) theory, in addition to the perceived threat, the perception of effectiveness can significantly influence adjusting behaviors (36). Encounter with foreign Persian language and social media may increase the risk of mental health problems by reducing the senses of personal and

governmental efficacy among Iranian citizens. Also, the impact of information and data depend on the level of trust to the source of information (22). As we can see in Table 2, the mean of trust to social media and foreign media were significantly greater than trusting the national media. We have also investigated the role of public trust and prior anxiety to illness. Our findings show elevated public trust can significantly reduce the proportion of mental health problems, and as we expected the higher level of sensitivity to illness increase the proportion of mental health problems. For example, with each 1 score increase in trusting the government, Ministry of Health, and the medical staff, there were 39%, 33.8%, and 14.3% decrease in the odds of total susceptibility, respectively. Also, the odds of total susceptibility increased 393.9%, 142.5%, and 189.7% by each 1 score increase in worrying about health, awareness of bodily sensations or changes and fear of consequences of having an illness, respectively. We used multivariate logistic regression analysis to determine best predictors of mental health problems. As seen in Table 4, final models of mental health problems include different types of variables. Being female and feeling symptoms in self significantly increased the odds of all mental health problems, which is in line with previous studies. Except for acute stress, trusting national media and trusting the government are significant parts of all models with decreasing effects on odds of mental health problems. Trusting the government, especially in the cases of uncertainty, has a key role in crisis management. It can increase the senses of efficacy and effectiveness in the management of problems.

Risk perception and safety behaviors are other important factors in pandemic management that we have investigated in our study. As noted in the literature, we studied these concepts in terms of societal risk, personal risk, avoidant behaviors, and preventive behaviors. The results of the univariate correlation analysis show these concepts are related to a wide range of variables. To confirm observed relationships and find the best predictors, we ran different multiple regression analysis for each component and then selected the best fitted model (see Tables 6 and 7). Based on our findings, there is a considerable difference between predictor variables of perceived social risk and perceived personal risk. However, the odds of perceived personal risk are mostly predicted by personal factors; public trust and media have a more substantial role on the odds of perceived social risk. Moreover, exposure to social media had a greater impact than other variables related to media in our study. This finding support previous studies that argued social media has a unique role in crisis management (37). However, potentially it could be both negative and positive. Also, based on our findings, trusting the national media decreases the odds of

perceived risks, but other media-related variables increase the odds of perceived risks.

As seen in previous studies, worrying about health, awareness of bodily sensations or changes, and fear of consequences of having an illness are personal variables that greatly influence the odds of both personal and societal risks. Both groups of safety behaviors (avoidant behaviors and preventive behaviors) have almost the same predictors. Being female, married, and having a higher educational level increase the odds of safety behaviors. In contrast, living alone decreases the odds of safety behaviors. The higher odds among married people and the lower odds among people who live alone may be justified by this notion that people usually think other people are at more risk than themselves. It is also seen that social media is related to higher odds of safety behaviors. By considering the low R² for both total models (ie, 0.08 for each models), we examined a new model by adding 2 new variables: perceived societal risk and perceived personal risk (we called them “B” models). As seen in Table 7, perceived societal risk remained in the final models (it was significant) and increased the R² of total models from 0.08 to 0.14 for “B” models. This magnitude confirmed the notion that safety behaviors are related to perceived risk.

Limitation

The most important limitation of our study was related to the method of data collection. As we used an online questionnaire, we may have missed some segments of the Iranian population. It also should be noted that based on sampling method, our sample may not be representative of all Iranian population.

Conclusion

In this study we investigated several important psychological and behavioral factors during pandemics. Our findings show the problematic psychiatric symptoms and disorders increase significantly during pandemics. Several factors are included in predicting, adjusting, and unadjusting behaviors. Public trust and national media can regulate the effect of pandemics. However, while they increase actual perceived risk and appropriate safety behaviors, they decrease psychological problems and disorders. However, social media increase perceived risk, safety behaviors, and psychological problems and disorders, especially severe acute stress. Being female, married, and having a higher educational level increase the odds of safety behaviors; in contrast, living alone decreases the odds of safety behaviors. Currently, we are in the early stages of the COVID-19 pandemic and its negative effects will probably increase substantially in the next few months. Many people have lost their relatives, their jobs, their social contacts (due to necessary avoidant behaviors), and are faced with a surge of negative news. Authorities should consider these critical issues and adopt

appropriate communicative and supportive approaches to prevent their long-lasting negative effects at both individual and societal levels.

Acknowledgment

We thank all of the participants. Also, we appreciate the persons who send the link of the questionnaire to participants.

Conflict of Interest

None.

References

1. Zhu N, Zhang D, Wang W, Li X, Yang B, Song J, et al. A novel coronavirus from patients with pneumonia in China, 2019. *New England Journal of Medicine* 2020.
2. Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, Zhang L, Fan G, Xu J, Gu X, Cheng Z. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *The Lancet*. 202;395(10223):497-506.
3. Ferretti L, Wymant C, Kendall M, Zhao L, Nurtay A, Bonsall DG, et al. Quantifying dynamics of SARS-CoV-2 transmission suggests that epidemic control and avoidance is feasible through instantaneous digital contact tracing. *medRxiv* 2020.
4. Coughlin SS. Anxiety and Depression: Linkages with Viral Diseases. *Public Health Rev*. 2012;34(2):7.
5. Fang L, Wu J, Miljkovic T. Modeling impact of natural hazard-induced disasters on income distribution in the united states. *IJDRS*. 2017;8(4):435-44.
6. Cowling BJ, Ng DM, Ip DK, Liao Q, Lam WW, Wu JT, et al. Community psychological and behavioral responses through the first wave of the 2009 influenza A(H1N1) pandemic in Hong Kong. *J Infect Dis*. 2010;202(6):867-76.
7. Blakey SM, Abramowitz JS. Psychological Predictors of Health Anxiety in Response to the Zika Virus. *J Clin Psychol Med Settings*. 2017;24(3-4):270-8.
8. Blakey SM, Reuman L, Jacoby RJ, Abramowitz JS. Tracing "Fearbola": Psychological Predictors of Anxious Responding to the Threat of Ebola. *Cognit Ther Res*. 2015;39(6):816-25.
9. Huang Y, Zhao N. Generalized anxiety disorder, depressive symptoms and sleep quality during COVID-19 outbreak in China: a web-based cross-sectional survey. *Psychiatry Res*. 2020;288:112954.
10. Tang F, Liang J, Zhou M, Zhang H, Osman Kelifa M, Wang C, et al. COVID-19Epidemic: How Is the Depression of People Staying in Wuhan and People Leaving Wuhan? A Cross-Sectional

- Study. A Cross-Sectional Study (2/13/2020) 2020.
11. Zhu Z, Xu S, Wang H, Liu Z, Wu J, Li G, et al. COVID-19 in Wuhan: Immediate Psychological Impact on 5062 Health Workers. medRxiv 2020.
 12. Xiang YT, Yang Y, Li W, Zhang L, Zhang Q, Cheung T, et al. Timely mental health care for the 2019 novel coronavirus outbreak is urgently needed. *Lancet Psychiatry*. 2020;7(3):228-9.
 13. Srivatsa S, Stewart KA. How Should Clinicians Integrate Mental Health Into Epidemic Responses? *AMA J Ethics*. 2020;22(1):E10-5.
 14. Asmundson GJ, Abramowitz JS, Richter AA, Whedon M. Health anxiety: current perspectives and future directions. *Curr Psychiatry Rep*. 2010;12(4):306-12.
 15. Abramowitz JS, Olatunji BO, Deacon BJ. Health anxiety, hypochondriasis, and the anxiety disorders. *Behav Ther*. 2007;38(1):86-94.
 16. Deacon B, Maack DJ. The effects of safety behaviors on the fear of contamination: an experimental investigation. *Behav Res Ther*. 2008;46(4):537-47.
 17. Helbig-Lang S, Petermann F. Tolerate or eliminate? A systematic review on the effects of safety behavior across anxiety disorders. *Clinical Psychology: Science and Practice*. 2010;17(3):218-33.
 18. Lau J, Griffiths S, Chan P, Tsui HY. SARS and avian flu: A serial of 6 surveillance surveys of anticipated behavioral and psychological responses to avian influenza pandemic in humans among the Hong Kong general public (SF-04). In Oral presentation at the 40th APACPH Annual Conference, November 7-9, 2008, Kuala Lumpur, Malaysia 2008 Nov 7.
 19. Betancourt TS, Brennan RT, Vinck P, VanderWeele TJ, Spencer-Walters D, Jeong J, et al. Associations between Mental Health and Ebola-Related Health Behaviors: A Regionally Representative Cross-sectional Survey in Post-conflict Sierra Leone. *PLoS Med*. 2016;13(8):e1002073.
 20. Gao J, Zheng P, Jia Y, Chen H, Mao Y, Chen S, et al. Mental health problems and social media exposure during COVID-19 outbreak. *PLoS One*. 2020;15(4):e0231924.
 21. Blair RA, Morse BS, Tsai LL. Public health and public trust: Survey evidence from the Ebola Virus Disease epidemic in Liberia. *Soc Sci Med*. 2017;172:89-97.
 22. Paek H-J, Hove T. Risk perceptions and risk characteristics. In: eds. *Oxford Research Encyclopedia of Communication*. City; 2017. p.
 23. Earle T, Siegrist M. Trust, confidence and cooperation model: a framework for understanding the relation between trust and risk perception. *INGEnvi*. 2008;8(1-2):17-29.
 24. Bangerter A, Krings F, Mouton A, Gilles I, Green EG, Clémence A. Longitudinal investigation of public trust in institutions relative to the 2009 H1N1 pandemic in Switzerland. *PLoS One*. 2012;7(11):e49806.
 25. Taylor MR, Agho KE, Stevens GJ, Raphael B. Factors influencing psychological distress during a disease epidemic: data from Australia's first outbreak of equine influenza. *BMC public health* 2008;8(1):347.
 26. Noorbala AA, Faghihzadeh S, Kamali K, Bagheri Yazdi SA, Hajebi A, Mousavi MT, et al. Mental Health Survey of the Iranian Adult Population in 2015. *Arch Iran Med*. 2017;20(3):128-34.
 27. Nazifi M, Mokarami HR, Akbaritabar AK, FarajiKujerdi M, Tabrizi R, Rahi A. Reliability, validity and factor structure of the persian translation of general health questionnaire (ghq-28) in hospitals of kerman university of medical sciences. *JFUMS*. 2014;3(4):336-42.
 28. Abramowitz JS, Deacon BJ, Valentiner DP. The Short Health Anxiety Inventory: Psychometric Properties and Construct Validity in a Non-clinical Sample. *Cognit Ther Res*. 2007;31(6):871-83.
 29. Shahidi S, Molaie A, Dehghani M. Relationship between health anxiety and alexithymia in an Iranian sample. *Procedia-Social and Behavioral Sciences* 2012; 46: 591-5.
 30. Christianson S, Marren J. The impact of event scale-revised (IES-R). *Medsurg Nurs* 2012; 21(5): 321-2.
 31. Panaghi L, Mogadam JA. Persian version validation in impact of event Scale-Revised. *Tehran University Medical Journal TUMS Publications* 2006; 64 (3): 52-60.
 32. Burkle FM, Jr. Acute-phase mental health consequences of disasters: implications for triage and emergency medical services. *Ann Emerg Med*. 1996;28(2):119-28.
 33. Flynn BW, Norwood AE. Defining normal psychological reactions to disaster. *Psychiatric Annals* 2004; 34(8): 597-603.
 34. Ferrer R, Klein WM. Risk perceptions and health behavior. *Curr Opin Psychol*. 2015;5:85-9.
 35. Champion VL, Skinner CS. The health belief model. *Health behavior and health education: Theory, research, and practice* 2008; 4: 45-65.
 36. Gore TD, Bracken CC. Testing the theoretical design of a health risk message: reexamining the major tenets of the extended parallel process model. *Health Educ Behav*. 2005;32(1):27-41.
 37. Freberg K, Palenchar MJ, Veil SR. Managing and sharing H1N1 crisis information using social media bookmarking services. *Public relations review* 2013; 39 (3): 178-184.

Table 4. Logistic Regression Models for Best Predictors of Mental Health Problems during the COVID-19 Pandemic

Outcome: Total Susceptibility									Outcome: Depression							
LR chi2(9) = 455.03									LR chi2(9) = 340.57							
P<0.001									P<0.001							
Pseudo R2= 0.1816									Pseudo R2= 0.164							
Variable	B	SE B	Likhood-ratio χ^2	p	OR	95% CI OR			Variable	B	SE B	Likhood-ratio χ^2	p	OR	95% CI OR	
Sex	0.601	0.117	27.18	0.000	1.824	1.451	2.294		Age	-0.244	0.065	14.41	0.000	1.556	1.201	2.015
Self-symptom	0.812	0.137	35.12	0.000	2.252	1.72	2.948		Sex	0.442	0.132	11.54	0.001	0.783	0.689	0.89
Other-symptom	0.401	0.134	8.89	0.003	1.493	1.148	1.941		Marital	-0.312	0.133	5.47	0.019	0.732	0.564	0.95
Medical_Cond	0.066	0.033	4.03	0.044	1.068	1.002	1.138		Self-symptom	0.333	0.142	5.44	0.019	1.395	1.057	1.842
TtNM	-0.26	0.058	20.17	0.000	0.771	0.687	0.864		TtNM	-0.28	0.066	18.58	0.000	0.756	0.665	0.86
TtG	-0.344	0.071	24.1	0.000	0.709	0.617	0.815		TtG	-0.339	0.081	18.12	0.000	0.712	0.608	0.835
TtMS	0.125	0.058	4.66	0.031	1.133	1.011	1.269		WaH	1.099	0.171	42.97	0.000	3	2.148	4.191
WaH	1.356	0.136	110.18	0.000	3.879	2.972	5.063		ABSC	-0.46	0.145	10.31	0.001	0.631	0.475	0.838
FCI	0.527	0.118	20.51	0.000	1.693	1.345	2.132		FCI	0.735	0.118	39.47	0.000	2.085	1.656	2.626
Block	Wald chi2		df	Pr>F				Block	Wald chi2		df	Pr>F				
B1	115.45		4	0.000				B 1	84.08		4	0.000				
B 2	77.71		1	0.000				B 2	74.57		1	0.000				
B 3	27.18		2	0.000				B 3	23.18		1	0.000				
B 4	174.49		2	0.000				B 4	130.74		3	0.000				
Outcome: Social									Outcome: Anxiety							
LR chi2(7) =241.54									LR chi2(6) = 360.76							
P<0.001									P<0.001							
Pseudo R2=0.0968									Pseudo R2=0.1415							
Variable	B	SE B	Likhood-ratio χ^2	p	OR	95% CI OR			Variable	B	SE B	Likhood-ratio χ^2	p	OR	95% CI OR	
Age	-0.11	0.049	5.09	0.024	1.393	1.125	1.725		Sex	0.675	0.112	37.51	0.000	1.964	1.577	2.446
Sex	0.332	0.109	9.37	0.002	0.896	0.814	0.986		Self-symptom	0.508	0.129	15.46	0.000	1.663	1.29	2.142
Self-symptom	0.413	0.126	10.71	0.001	1.511	1.181	1.933		TtNM	-0.233	0.056	17.46	0.000	0.792	0.709	0.884
TtNM	-0.203	0.055	13.85	0.000	0.816	0.733	0.909		TtG	-0.268	0.067	16.19	0.000	0.765	0.67	0.872
TtG	-0.311	0.065	23.4	0.000	0.733	0.645	0.832		TtMS	0.16	0.056	8.17	0.004	1.173	1.051	1.31
WaH	0.598	0.121	24.91	0.000	1.818	1.435	2.305		WaH	1.604	0.123	208.93	0.000	4.972	3.906	6.329
FCI	0.484	0.109	20.04	0.000	1.622	1.31	2.009		Block	Wald chi2		df	Pr>F			
Block	Wald chi2		df	Pr>F				Block	Wald chi2		df	Pr>F				

Outcome: Soma									Outcome: Acute Stress								
LR chi2(5) = 319.93									LR chi2(5) = 439.9								
P<0.001									P<0.001								
Pseudo R2=0.1372									Pseudo R2=0.1691								
Variable	B	SE B	Likhood-ratio χ^2	p	OR	95% CI OR			Variable	B	SE B	Likhood-ratio χ^2	p	OR	95% CI OR		
	Sex	0.407	0.119	12.03	0.001	1.512	1.199	1.907	B1	Sex	0.626	0.11	32.79	0.000	1.869	1.506	2.320
B1	Self-symptom	1.428	0.132	119.25	0.000	4.185	3.229	5.424	B2	Self-symptom	0.517	0.136	14.71	0.000	1.677	1.285	2.188
	Other-symptom	0.354	0.133	6.94	0.008	1.423	1.096	1.847	B2	TtSM	0.189	0.062	9.51	0.002	1.209	1.071	1.364
B2	TtNM	-0.077	0.059	1.69	0.194	0.841	0.755	0.938	B3	WaH	1.997	0.149	218.09	0.000	7.37	5.501	9.874
	TtG	-0.119	0.069	3	0.083	3.088	2.471	3.859	B3	FCI	0.507	0.124	17.38	0.000	1.66	1.302	2.115
B3	WaH	1.129	0.114	106.74	0.000	0.082	0.049	0.138									
	Block	Wald chi2		df	Pr>F						Wald chi2		df	Pr>F			
	B 1	186.06		3	0.000						66.62		2	0.000			
	B 2	13.45		1	0.000						23.75		1	0.000			
	B 3	98.32		1	0.000						242.8		2	0.000			

Worry about health (WaH), Awareness of bodily sensations or changes (ABSC), Feared consequences of having an illness (FCI), Perceived societal risk (PSR), Perceived personal risk (PPR), Avoidant Behaviors (ABs), Preventive Behaviors (PBs), Trust to government (TtG), Trust to ministry of health (TtMH), Trust to medical staffs (TtMS), Exposure with COVID-19 information from national media (EtNM), Trust to national media (TtNM), Exposure with COVID-19 information from foreign media (EtFM), Trust to foreign media (TtFM), Exposure with COVID-19 information from social media (EtSM), Trust to social media (EtSM).

B1: first block (group) of predictor variables, B2: second block (group) of predictor variables, B3: third block (group) of predictor variables, B4: fourth block (group) of predictor variables.

Table 5. Bivariate Correlation between Perceived Risks (Societal and Personal), Safety Behaviors (Preventive and Avoidant Behaviors) and their Predictor Variables during the COVID-19 Pandemic

	Societal Risk	Personal Risk	Avoidant Behaviors	Preventive Behaviors
Age	-0.0896*	-0.0267	0.0287	-0.0269
	P<0.001	P =0.247	P =0.2139	P =0.2429
Sex	0.0765*	-0.0861*	0.1065*	0.0648*
	P<0.001	P<0.001	P<0.001	P<0.01
Education	0.0306	0.1285*	0.0892*	0.0671*
	P =0.1848	P<0.001	P<0.001	P<0.01
Marital	-0.0331	0.0104	0.0715*	0.0525*

	P= 0.1507	P=0.6512	P<0.001	P<0.05
Alone	0.0025	0.0166	-0.0634*	-0.0665*
	P=0.9154	P=0.4728	P<0.01	P<0.01
EtNM	0.042	0.0423	0.0389	0.0618*
	0.0683	0.0667	0.0916	0.0073
TtNM	-0.2199*	-0.0764*	-0.0700*	-0.0535*
	P<0.001	P<0.001	P<0.01	P<0.05
EtFM	0.1857*	0.1040*	0.0609*	0.1032*
	P<0.001	P<0.001	P<0.001	P<0.01
TtFM	0.2275*	0.1575*	0.0424	0.0898*
	P<0.001	P<0.001	P =0.0664	P<0.001
EtSM	0.2667*	0.1759*	0.1304*	0.1455*
	P<0.001	P<0.001	P<0.001	P<0.001
TtSM	0.2283*	0.1341*	0.0914*	0.1502*
	P<0.001	P<0.001	P<0.001	P<0.001
Self-symptom	0.1191*	0.2071*	-0.0104	0.0289
	P<0.001	P<0.001	P=0.6522	P=0.2096
Other-symptom	0.0720*	0.1629*	0.0233	0.0403
	P<0.01	P<0.001	P =0.3122	P =0.0804
Positive case in relatives	0.0640*	0.1546*	0.0136	0.0093
	P<0.01	P<0.001	P=0.5566	P=0.6875
Having high risk medical condition	-0.0175	0.0510*	0.0275	-0.0139
	P=0.4491	P<0.05	P=0.2335	P=0.5477
TtG	-0.2857*	-0.1165*	-0.0888*	-0.0585*
	P<0.001	P<0.001	P<0.001	P<0.01
TtMH	-0.2687*	-0.1256*	-0.0617*	-0.0406
	P<0.001	P<0.001	P<0.01	P=0.0786
TtMS	-0.0411	-0.0974*	0.0465*	0.0578*
	P<0.001	P<0.001	P<0.05	P<0.01
WaH	0.3725*	0.3907*	0.1446*	0.1871*
	P<0.001	P<0.001	P<0.001	P<0.001
ABSC	0.2771*	0.2142*	0.1423*	0.1406*
	P<0.001	P<0.001	P<0.001	P<0.001
FCI	0.2733*	0.2699*	0.0917*	0.0897*
	P<0.001	P<0.001	P<0.001	P<0.001

Worry about health (WaH), Awareness of bodily sensations or changes (ABSC), Feared consequences of having an illness (FCI), Perceived societal risk (PSR), Perceived personal risk (PPR), Avoidant Behaviors (ABs), Preventive Behaviors (PBs), Trust to government (TtG), Trust to ministry of health (TtMH), Trust to medical staffs (TtMS), Exposure with COVID-19 information from national media (EtNM), Trust to national media (TtNM), Exposure with COVID-19 information from foreign media (EtFM), Trust to foreign media (TtFM), Exposure with COVID-19 information from social media (EtSM), Trust to social media (EtSM).

B1: first block (group) of predictor variables
 B2: second block (group) of predictor variables
 B3: third block (group) of predictor variables
 B4: fourth block (group) of predictor variables.

Table 6. Multivariable Regression Models for Best Predictors of Perceived Societal and Personal Risk during the COVID-19 Pandemic

Perceived Societal Risk							Perceived Personal Risk						
F(11, 1868)=64.6 P<0.001 R-squared=0.276							F(10, 1869)=65.63 P<0.001 R-squared=0.26						
Variable	Coef.	Std. Err.	t	P>t	Beta		Variable	Coef.	Std. Err.	t	P>t	Beta	
Sex	0.086	0.031	2.720	0.007	0.054		Sex	-0.173	0.038	-4.560	0.000	-0.091	
Self-symptom	0.110	0.038	2.890	0.004	0.058		Education	0.082	0.013	6.290	0.000	0.127	
EtNM	0.043	0.016	2.660	0.008	0.056		Self-symptom	0.283	0.047	5.970	0.000	0.125	
TtNM	-0.049	0.017	-2.960	0.003	-0.076		Other-symptom	0.162	0.048	3.390	0.001	0.073	
TtFM	0.058	0.015	3.810	0.000	0.084		Positive case in relatives	0.307	0.058	5.290	0.000	0.109	
EtSM	0.107	0.020	5.470	0.000	0.123		TtFM	0.070	0.017	4.130	0.000	0.086	
TtSM	0.060	0.020	3.010	0.003	0.068		EtSM	0.103	0.022	4.770	0.000	0.099	
TtG	-0.140	0.019	-7.230	0.000	-0.190		WaH	0.673	0.052	12.930	0.000	0.368	
TtMS	0.070	0.016	4.260	0.000	0.090		ABSC	-0.126	0.043	-2.910	0.004	-0.076	
WaH	0.439	0.035	12.400	0.000	0.286		FCI	0.141	0.039	3.610	0.000	0.084	
FCI	0.114	0.033	3.490	0.000	0.080								
Block	F	df	df	Pr>F	R2	change in R2	Block	F	df	df	Pr>F	R2	change in R2
B 1	18.93	2	1877	0	0.0198		B 1	37.7	5	1874	0	0.0914	
B 2	56.35	5	1872	0	0.148	0.1282	B 2	38.63	2	1872	0	0.1274	0.036
B 3	25.48	2	1870	0	0.1706	0.0226	B 3	111.52	3	1869	0	0.2599	0.1325
B 4	135.35	2	1868	0	0.2756	0.105							

Worry about health (WaH), Awareness of bodily sensations or changes (ABSC), Feared consequences of having an illness (FCI), Perceived societal risk (PSR), Perceived personal risk (PPR), Avoidant Behaviors (ABs), Preventive Behaviors (PBs), Trust to government (TtG), Trust to ministry of health (TtMH), Trust to medical staffs (TtMS), Exposure with COVID-19 information from national media (EtNM), Trust to national media (TtNM), Exposure with COVID-19 information from foreign media (EtFM), Trust to foreign media (TtFM), Exposure with COVID-19 information from social media (EtSM), Trust to social media (EtSM).

B1: first block (group) of predictor variables, B2: second block (group) of predictor variables, B3: third block (group) of predictor variables, B4: fourth block (group) of predictor variables.

Table 7. Multivariable Regression Models for Best Predictors of Safety Behaviors during the COVID-19 Pandemic

F(9, 1871)= 17.98 P<0.001 R-squared=0.08						F(9, 1870)=19.32 P<0.001 R-squared=0.085							
Total	733.470	1,880	0.390	Root MSE	0.601	Total	948.870	1,879	0.505	Root MSE	0.681		
Avoidant behaviors "A"						Preventive behaviors "A"							
Variable	Coef.	Std. Err.	t	P>t	Beta	Variable	Coef.	Std. Err.	t	P>t	Beta		
Sex	0.145	0.029	4.940	0.000	0.110	Sex	0.098	0.033	2.930	0.003	0.065		
Education	0.046	0.010	4.540	0.000	0.102	Education	0.042	0.011	3.690	0.000	0.083		
Marital	0.121	0.031	3.950	0.000	0.091	Marital	0.082	0.035	2.370	0.018	0.054		
Alone	-0.118	0.052	-2.280	0.023	-0.052	Alone	-0.169	0.059	-2.880	0.004	-0.066		
EtSM	0.063	0.016	3.880	0.000	0.088	EtFM	0.033	0.011	2.860	0.004	0.067		
TtG	-0.059	0.015	-4.030	0.000	-0.097	EtSM	0.053	0.021	2.590	0.010	0.065		
TtMS	0.060	0.015	3.940	0.000	0.093	TtSM	0.071	0.020	3.510	0.000	0.086		
WaH	0.126	0.037	3.360	0.001	0.099	TtMS	0.063	0.016	3.840	0.000	0.086		
ABSC	0.081	0.033	2.420	0.016	0.071	WaH	0.261	0.032	8.020	0.000	0.181		
Block	F	df	df	Pr>F	R2	change in R2	Block	F	df	df	Pr>F	R2	change in R2
1	14.72	4	1876	0	0.0304		1	7.89	4	1875	0	0.0165	
2	28.45	1	1875	0	0.0449	0.0145	2	21.46	3	1872	0	0.0492	0.0327
3	11.16	2	1873	0	0.0562	0.0113	3	8.59	1	1871	0.0034	0.0536	0.0043
4	23.8	2	1871	0	0.0796	0.0234	4	64.33	1	1870	0	0.0851	0.0315
Avoidant behaviors "B"						Preventive behaviors "B"							
F(7, 1873)=46.02		P<0.001	R-squared=0.147			F(9, 1870)=36.2		P<0.001	R-squared=0.148				
Variable	Coef.	Std. Err.	t	P>t	Beta	Variable	Coef.	Std. Err.	t	P>t	Beta		
Sex	0.121	0.028	4.290	0.000	0.092	Sex	0.073	0.032	2.270	0.024	0.049		
Education	0.044	0.010	4.580	0.000	0.099	Education	0.037	0.011	3.370	0.001	0.073		
Marital	0.110	0.029	3.750	0.000	0.083	Marital	0.085	0.033	2.560	0.011	0.056		
Alone	-0.115	0.050	-2.300	0.021	-0.051	Alone	-0.163	0.057	-2.870	0.004	-0.063		
TtMS	0.041	0.014	2.990	0.003	0.064	EtFM	0.021	0.011	1.940	0.053	0.043		
ABSC	0.068	0.025	2.680	0.008	0.060	TtSM	0.052	0.018	2.840	0.005	0.063		
social_risk	0.262	0.018	14.240	0.000	0.318	TtMS	0.061	0.016	3.890	0.000	0.084		
						WaH	0.122	0.033	3.630	0.000	0.084		

Block	F	df	df	Pr>F	R2	change in R2	social_risk	F	df	df	Pr>F	R2	change in R2	
B 1	14.72	4	1876	0	0.0304		0.270	7.89	4	1875	0	0.0165		
B 2	5.05	1	1875	0.0247	0.033	0.0026	0.022	26.98	2	1873	0	0.0441	0.0275	
B 3	42.22	1	1874	0	0.0543	0.0213	12.090	9.11	1	1872	0.0026	0.0487	0.0046	
B 4	202.88	1	1873	0	0.1468	0.0924	0.000	67.41	1	1871	0	0.0818	0.0331	
								B 5	146.17	1	1870	0	0.1484	0.0666

Worry about health (WaH), Awareness of bodily sensations or changes (ABSC), Feared consequences of having an illness (FCI), Perceived societal risk (PSR), Perceived personal risk (PPR), Avoidant Behaviors (ABs), Preventive Behaviors (PBs), Trust to government (TtG), Trust to ministry of health (TtMH), Trust to medical staffs (TtMS), Exposure with COVID-19 information from national media (EtNM), Trust to national media (TtNM), Exposure with COVID-19 information from foreign media (EtFM), Trust to foreign media (TtFM), Exposure with COVID-19 information from social media (EtSM), Trust to social media (EtSM).

B1: first block (group) of predictor variables, B2: second block (group) of predictor variables, B3: third block (group) of predictor variables, B4: fourth block (group) of predictor variables