Factors Associated with Social Avoidance of Recovered COVID-19 Patients in Iran: A National Study

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Research

Abstract

Background: Misconceptions about the infection and health consequences of recovered Coronavirus Disease 2019 (COVID-19) patients often lead to a fear, social avoidance and discriminatory attitude. The present study explored the Factors associated with social avoidance and job-related discriminatory attitude against recovered COVID-19 patients.

Methods: The present cross-sectional online study was conducted on 3,836 Iranian participants above 15 years old. The participant selected conveniently between February 19, 2021 and May 21, 2021. The data collected using a reliable and valid questionnaire that developed by research team. Univariate and multivariate linear regression analysis was used to identify the impact of factors related to social discrimination and discriminatory attitudes towards improved COVID-19 patients.

 Results: The results shows 56.72 and 49.06% of the population had social avoidance and job-related discriminatory attitude respectively. Furthermore, age, gender, education level, marital status, employment, presence of a recovered COVID-19 patient in family and place of residence were significant factors influencing social avoidance and job-related discriminatory attitude. As an instance, those in the 45-64 age group showed 1.1 times more social avoidance than the 20-29 age group. Also, men showed 37% less social avoidance than women. Social avoidance was significantly higher and the discriminatory attitude was higher in participants of lower education level. Besides, the job-related discriminatory attitude was 1.2 times higher in the 45-64 than the 20-29 age group. The discriminatory attitude was 16% less in men, 39%, 25% and 49% less, respectively in participants with a secondary school, diploma or university degree.

Conclusions: To reduce social avoidance and job-related discriminatory attitude we suggest that the medical sector and relevant organizations provide clear and comprehensive information about improved COVID-19 patients to their families and general public through direct communication and the mass media. Base on the study results they need more focus on urban residents, women and families with a recovered member

Background

The end of December 2019 was accompanied by an epidemic of acute respiratory infections initiated in Wuhan, China. It was induced by a new coronavirus, later named as SARS-CoV-2. The disease is highly contagious and can be directly and immediately spread among people [1]. Interpersonal transmission has been mainly through the airway, and the epidemic is fast at a global scale. As the COVID-19 pandemic progresses worldwide, the fear of infection is increased and, with it, the stigma-discrimination of people is increased too which is an additional issue [2]. Thus, health workers, patients with active COVID-19 infection and their families, as well as those who have recovered from the disease face high levels of stigma-discrimination [3].

Though the new cases of COVID-19 are being diagnosed every day, thousands of patients recover from the disease too with the effective therapeutic measures [4]. 3 September 20201 In Iran, the rate of affliction has been 5,055,512 Among them 4,269,508 have recovered.

When patients recover and hope to return to normal life, many carry long-term physical symptoms such as residual respiratory symptoms, and experience psychosocial difficulties such as employment and financial issues [5, 6]. Moreover, Wu et al. [6] reported that about 10% of the COVID-19 recovered patients were diagnosed as anxious and depressed due to the remaining respiratory residual symptoms after discharge (from hospital), fear of recurrence, and transmission of the disease to others. Therefore, recovered COVID-19 patients suffer from enormous physiological and psychological health issues. Similarly, another study showed that SARS survivors were stigmatized by the general public [7]. SARS survivors had considerable difficulties in living a normal life as they were constantly stigmatized by the public [8]. Therefore, public attitudes play a vital role in prompting SARS survivors to get back into society. Similarly, public attitudes may have significant effects on recovered COVID-19 patients. Thus, it seems imperative to explore the public attitude towards recovered patients. There may be misconceptions about the infection and the adverse effects of the disease in recovered patients. These misconceptions can be fearsome to people encountering these recovered patients. Thus, they may experience discrimination in society, as explored and reported in a body of research [8, 9].

The existing literature has primarily explored the public awareness of and attitude toward COVID-19 and the acceptance of its vaccine [10, 11]. A few studies investigated social labelling among COVID-19 patients including Miranda's correlational study of stigmatization and the fear of affliction with COVID-19 in Columbian population [12], or focused on people's experience of COVID-19 social labelling [13]. To our best knowledge, only two studies with different samples, methods and instruments have been conducted about recovered COVID-19 patients [4, 14]. Moreover, it seems that social avoidance of these patients differs across countries, cultures and vaccination. The present study is pioneering in Iran in quantitatively investigating social avoidance and job-related discrimination against recovered COVID-19 patients and the underlying factors. It also explores the public attitude toward recovered COVID-19 patients. We hope the present findings can be illuminating for health policy makers in their attempts to lower the discriminatory attitude to recovered COVID-19 patients or other similar viruses in future.

Method

Design and Participants

The present descriptive-analytical research was cross-sectional in type and the sampling was convenient. It was conducted among Iranian population above 15 years of age. The data were collected from voluntary participants between February 19, 2021 and May 21, 2021. Of note is that when the questionnaires were distributed and when the transcription was done, the vaccination was not provided for all people except for the elderly and those holding certain jobs. Thus, social avoidance and discriminatory attitude prevailed among the public.

Setting

As the second largest middle eastern country, Iran with an area of 1,648,15 km^2 is located in west Asia. This country consists of 7 geographical areas, 31 provinces and a population of about 84.4 million people. The total number of COVID-19 patients in Iran has been about 5,055,512 The present survey was done in 31 provinces and 110 cities representing all areas in the country. The inclusion criteria were an age above 15, no current or previous affliction with COVID-19, and being able to read and write. Unwillingness to participate was an exclusion criterion.

Sample size and Sampling method

The sampling was convenient in type and the sample size depended on the individuals' willingness to participate and fill out the questionnaires. Due to the highly contagious nature of the disease and prevention of infection, the questionnaires were completed online. The online version was created in Google Forms and the hyperlinks were sent over What's App, Instagram and Telegram (the most popular social networks). To access more respondents, the links were shared in Twitter and Facebook too. The questionnaire contained a brief description of the purpose and significance of research and assured participants of the confidentiality of the information they provided. Instructions on how to answer the items and then the items followed. It was also reminded that only one member of every family, who was better representative of the target population, was supposed to fill out the questionnaire. At first, the respondent was asked whether or not s/he had already been affected by or recovered from the disease. If the answer was positive, the participant was not provided with the next questions (main questionnaire content). If the answer was negative, s/he was given access to the rest of the survey.

Survey content, instrument and scoring system:

The items contained in the survey were closed-ended. They were to be rated on a Likert scale or answered as yes or no. Questionnaire completion took about 15 minutes in three parts.

Part 1

Socio-demographic information (as the independent variable):

Demographic variables included participants' age (expressed in years) divided into three categories (18–29, 30–44, 45–64), gender (male/female), place of residence (urban, rural), marital status in two categories (never or ever married), schooling level in four categories (elementary school, high school, diploma, university), job in three categories (student & collegian, employed, unemployed), socio-economic status (SES) based on the distribution of the household crowding index (person/room ratio), and decreasing crowdedness levels categorized as upper, middle or lower SES (crowding index 3 people per room) [15, 16], and the state of having a recovered COVID-19 among relatives or friends (yes/no).

Part 2

The dependent variable

This part of the questionnaire contained items exploring "attitude to recovered COVID-19 patients" (10 items, for example "Eating out with recovered COVID-19 patients can transmit the disease"). The items were to be responded as yes or no. Part 2 also included items enquiring about the "avoidance of recovered COVID-19 patients" (11 items, for example "I avoid working with recovered COVID-19 patients"). A single item asked about job-related discriminatory attitude (e.g. "I believe recovered COVID-19 patients should avoid certain jobs such as food services, teaching, nursing and so on"). The relevant items were rated on a Likert scale ranging from strongly agree to strongly disagree. To estimate the total social avoidance and job-related discriminatory attitude scores, the scores for each part were added up. The cutoff point of social avoidance was determined based on the mean score. Thus, a score below the mean score was taken as low social avoidance and a score at or above the mean was interpreted as high social avoidance. Also, to set the cutoff point for job-related discriminatory attitude, the same procedure went on. A score below the mean score was taken as low job-related discriminatory attitude and a score at or above the mean was interpreted as high discriminatory attitude.

Survey development, validation, and reliability:

The questionnaire contained closed-ended items to be rated on a Likert scale as well as yes/no questions. Each questionnaire would take 15 minutes to fill out. The content was developed based on a review of the related literature. Before the main data collection phase, the questionnaire was pretested on 30 participants all above 15 years of age, and their commentaries were used to improve the readability and organization of the content. These respondents were selected from 6 different provinces with a high prevalence of the disease. The comments were used to revise the initial draft and then these respondents were excluded from the main data collection. Besides, the first draft was availed to a panel of experts in the field to check the readability, simplicity, relevance and importance of the content. Their comments were used to develop the questionnaire. The test-retest method was used to check the reliability of the instrument. To this aim, the questionnaire was provided to 20 participants in similar conditions twice at a two-week interval. Then, to estimate the correspondence between the test and retest, the intra-class correlation coefficient (ICC) was used. The ICC was estimated at .83, which points to a high reliability of the test.

Ethical considerations

A formal permission was gained from the Ministry of Health to carry out this questionnaire survey. All ethical considerations were included such as the confidentiality of the information, the anonymity of respondents, clear instructions, informed consent to participate and information provision to authorities for the required policy making. The present work of research received an ethical code of IR.HUMS.REC.1399.061 from Hormozgan University of medical sciences.

Statistical analysis

To describe quantitative variables, mean and standard deviation were used and to describe qualitative variables, frequency and relative frequency were employed. The dependent variables in the present study were social avoidance and job-related discrimination, each being bimodal. To test the relationship between the dependent and independent variables, firstly, univariate analysis was used and then for variables whose odds ratio was below .25, multiple logistic regression analysis was run. SPSS 21 was used to do all the required statistical procedures and the p-value was set at < .05.

Results

Participants' demographic information

The total number of participants was 3,836. Their age ranged between 18 and 64 years and the mean was 33.95(± 10.32) years. 2,063 participants (53.8%) were male and 1,773 (46.2%) were female. The majority of participants were urban residents (n = 2,853, 74.4%). 2,242 (58.4%) were ever married. A total number of 1,786 (46.6%) held a university degree. The other demographic information is summarized in Table 1.

Table 1
Research participants' demographic information in Iran (n = 3,836)

Variable	Category	Frequency	Percentage (%)
Age (years)	18−29	1,594	41.6
	30−44	1,630	42.5
	45−64	612	16.0
Gender	male	2,063	53.8
	female	1,773	46.2
Residence	urban	2,853	74.4
	rural	983	25.6
Marital status	Never married	1,594	41.6
	Ever married	2,242	58.4
Educational level	elementary school	348	9.1
	High school	576	15.0
	Diploma	1,126	29.4
	university	1,786	46.6
Job	student & collegian	899	23.4
	employed	1,488	38.8
	unemployed	1,449	37.8
Socio economic status	low	682	17.8
	Moderate	2,014	52.5
	High	1,140	29.7
Presence of a recovered COVID-19 patient in family or friends	Yes	864	22.5
	No	2,972	77.5

Attitude toward recovered COVID-19 patients (n = 3,836)

As the results revealed, 73.8%, 65.30% and 75.3% of the participants, respectively, believed that the recovered COVID-19 patients can for long transmit the disease to others, eating out with them can transmit the disease and shaking hands with them can be a threat too. 60% of the participants believed

that the recovered COVID-19 patients suffer a poor health in the long run. 73.8% reckoned that the recovered population fail to do their tasks and duties at work (Table 2).

Table 2
:Attitude to recovered COVID-19 patients in Iran (n = 3836)

% of agreement with statements	Male (n = 2,063)	Female (n = 1,773)	All respondents	P – value
Recovered COVID-19 patients can transmit the disease for long.	1,608(77. 9)	1,222(68. 9)	2,830(73.8)	0.000
Eating out with recovered COVID-19 patients can transmit the disease.	1,500(72. 7)	1,005(67.96)	2,505(65.30)	0.006
Shaking hands with recovered COVID-19 patients can transmit the disease.	1,596(77.4)	1,294(73)	2,890(75.3)	0.001
Recovered COVID-19 patients cannot do their tasks and duties at work.	1,584(75)	1,282(72.3)	2,830(73.8)	0.030
Recovered COVID-19 patients have a poor health in the long run.	1,224(59.3)	1,079(60. 9)	2,303(60)	0.176
If we go out with recovered COVID-19 patients, we increase the chances of affliction with the disease for ourselves and the family.	840(40.7)	707(39.9)	1,547(40.3)	0.310
COVID-19 patients are mentally pressed for discrimination, criticism and gossips.	1,116(54.1)	792(44.7)	1,908(49.7)	0.000
Recovered COVID-19 patients did not adhere to health advice and are fully responsible for their behavior.	1,488(72.1)	1,462(82.5)	2,950(76.9)	0.000
Recovered COVID-19 patients were brave enough to overcome the disease.	684(33.2)	851(48)	1,535(40)	0.000
Recovered COVID-19 patients were infected in life or at work due to their own careless behavior and, thus, they need help.	972(47.1)	767(43.3)	1,739(45.3)	0.009

Social avoidance, discrimination at work and overall perception of recovered COVID-19 patients (n = 3,836)

56.72% and 49.06% of the participants, respectively, showed social avoidance and job-related discriminatory attitude (Fig. 1). 51% of the respondents preferred to avoid any physical contact with recovered COVID-19 patients. Also, 75% believed that children need to avoid close physical contact with recovered COVID-19 patients (Fig. 2). As the results showed, 82% and 75% of the population had a discriminatory attitude toward those in charge of nursing, caregiving and teaching at kindergarten (Fig. 3).

Correlation between demographic variables and social avoidance in recovered COVID-19 patients (n = 3,836)

As the present findings showed, social avoidance was significantly higher in the 45–64 age group than the 20–29 age group (AOR = 1.10, 1.04–2.93), in urban than rural residents (AOR = 1.23, 1.28–3.95), in diploma holders than those holding an elementary school degree (AOR = 1.42, 1.13–2.71) and those with a university degree than with an elementary school degree holders (AOR = 2.19, 1.15–3.36), in school and university students than the unemployed (AOR = 2.32, 1.81–3.50), employed than the unemployed (AOR = 1.51, 1.20–2.64) and those with a recovered COVID-19 patient at home than others (AOR = 2.35, 1.28–6.51). Male participants had a lower social avoidance (AOR = .63, .54-.88). The relevant information is summarized in Table 3.

Table 3

Bivariate and multivariate logistic regression analysis showing factors associated with social avoidance in Iran (n = 3,836)

Age	Category	High avoidance	Low avoidance	COR(95% CI)	AOR(95% CI)
	18−29	847(53.13%)	747(46.87%)	ref	ref
	30−44	924(56.68%)	706(43.31%)	1.15(1.02−1.32)	1.07(0.72−1.14)
	45−64	405(66.17%)	207(33. 82%)	1.17(1.41−2.10)	1.10(1.04−2.93)
Gender	Male	1,201(58.21%)	862(41.79%)	.87 (.77-.99)	.63(.54-.88)
	Female	975(54.99%)	798(44.01%)		
Residence	Urban	1,499(52.54%)	1,354(47.46%)	1.99 (1.71−2.33)	1.23 (1.28−3.95)
	Rural	677(68.9%)	306(31.1%)		
Marital status	Never married	862(54.07%)	732(45.93%)	1.20 (1.06−1.37)	1.08 (0.61−1.19)
	Ever married	1,314(58.60%)	928(41.40%)		
Educational level	Elementary school	247(70.97%)	101(29.03%)	ref	ref
	High school	287(49.82%)	289(50.18%)	1.00 (0.75−1.31)	1.05 (0.79−1.11)
	Diploma	662(58.79%)	464(41.21%)	1.28 (0.99−1.64)	1.42 (1.13−2.71)
	Academic degree	980(54.87%)	806(45.13%)	1.61 (1.26−2.05)	2.19 (1.15−3.36)
Employment	student & collegian	564(62.73%)	335(37.27%)	1.43(1.20−1.71)	2.32 (1.81−3.50)
	employee	884(59.40%)	604(40.60%)	1.24(1.07−1.45)	1.51 (1.20−2.64)
	not working	728(50.24%)	721(49.76%)	ref	ref
Socio economic status	low	425(62.31%)	257(37.69%)	ref	ref
	moderate	1,110(55.11%)	904(44.89%)	.74(.61-.89)	1.16(.82-1.49)

	high	641(56.22%)	499(43.78%)	.77(.63-.94)	1.21(.73-1.36)
Presence of a recovered COVID-19 patient in family and friends	yes	570(65.97%)	294(34.3%)	1.64(1.40–1.93)	2.35(1.28–6.51)
	no	1,606(54.04%)	1,366(45.96%)		

Correlation between demographic variables and job-related discriminatory attitude to recovered COVID-19 patients (n = 3,836)

Job-related discrimination across demographic variables showed that discrimination was higher in the 45–64 age group (AOR = 1.29, 1.05–2.29), among the single (AOR = 1.15, 1.09–2.02), urban residents (AOR = 1.90, 1.68–2.99), high SES group (AOR = 1.20, 1.05–1.79) or moderate (AOR = 1.08, .92-1.26), and among those with a recovered COVID-19 patient in their family (AOR = 1.33, 1.15–1.89). Male participants (AOR = .84, .58-.96), those with a secondary school degree (AOR = .61, .37-.75), a diploma (AOR = .75, .61-.97) and university degree (AOR = .51, .43-.77) had a less discriminatory attitude (Table 4).

Table 4

Bivariate and multivariate logistic regression analysis showing factors associated with discrimination in Iran (n = 3836)

Age	category	High job-related discrimination	Low job-related discrimination	COR(95% CI)	AOR(95% CI)
	18−29	763(47.86%)	831(52.14%)	ref	ref
	30−44	783(48.03%)	847(51.97%)	1.00(0.87−1.15)	.09(0.81−1.06)
	45−64	336(54.90%)	276(45.10%)	1.32(1.09−1.60)	1.21(1.05−2.29)
Gender	Male	1,067(51.72%)	996(48.28%)	.79(.67-.90)	.84(.58-.96)
	Female	815(45.96%)	958(54.04%)		
Residence	**urban**	1,258(44.09%)	1,595(55.91%)	2.20 (1.9−2.56)	1.90(1.68−2.99)
	Rural	624(63.47%)	359(36.43%)		
Marital status	Never married	707(44.35%)	887(55.65%)	1.38 (1.21−1.57)	1.15(1.09−2.02)
	Ever married	1,175(52.40%)	1,067(47.60%)		
Educational level	Elementary school	228(65.51%)	120(34.49%)	ref	ref
	High school	252(43.75%)	324(56.25%)	0.40 (0.30−0.54)	0.61 (0.37−0.75)
	Diploma	635(56.39%)	491(43.61%)	0.68 (0.52−0.88)	0.75 (0.61−0.97)
	Academic degree	767(42.94%)	1,019(57.06%)	0.39 (0.30−0.50)	0.51 (0.43−0.77)
employment status	student & collegian	396(44.04%)	503(55.96%)	1.05 (0.88−1.24)	0.92 (0.76−1.10)
	employed	866(58.19%)	622(41.79%)	1.86 (1.60−2.16)	1.66 (1.47−1.95)
	unemployed	620(42.78%)	829(57.22%)	ref	ref
SES	low	301(44.13%)	381(55.87%)	ref	ref
	moderate	999(49.60%)	1,015(50.40%)	1.24	1.08

				(1.04–1.48)	(0.92–1.26)
	high	582(51.05%)	558(48.95%)	1.32 (1.08–1.60)	1.20 (1.05–1.79)
Presence of a recovered COVID-19 patient in family and friends	yes	384(44.44%)	480(55.56%)	1.27 (1.08–1.48)	1.33 (1.15–1.89)
	no	1,498(50.40%)	1,474(49.60%)		

Discussion

The present research was conducted in Iran with the aim of exploring social avoidance of and discriminatory attitude to recovered COVID-19 patients at work. While this survey was being conducted, no adequate information was available to people about the health state of recovered COVID-19 patients in Iran. It was highly probable that some people had misconceptions about the recovered patients. As the present findings showed, 49-56.72% of the respondents showed a willingness for job-related discriminatory behavior and social avoidance. Thus, many recovered COVID-19 patients might face serious issues coming back to a normal life. Mental and psychological pressure was a major issue in recovered COVID-19 patients' lives [17]. It seems that certain mental and psychological issues result from a discriminatory attitude toward these patients [4]. Probably, one reason for social avoidance is the fear of affliction with COVID-19. Due to the highly contagious nature of the disease and the high mortality rate, people can see themselves at a higher risk and, thus, attempt to show more protective behaviors and, as a result, more discriminatory behaviors. A relevant study showed that social labeling of COVID-19 was higher among people with a stronger fear [12]. It can be also argued that as COVID-19 is a new disease, it is not yet fully understood by people. People often have a fear of the unknown which can prevent effective communication with others. Promoting knowledge through the provision of accurate medical information can help correct people's misconceptions about recovered COVID-19 patients and reduce the discriminatory attitude to a great extent. A similar study suggested educational measures be taken to improve public knowledge and reduce the rate of social labeling for HIV patients [18]. Provision of extensive healthcare instructions, publication of clear and accurate information about COVID-19 and consultations to reduce or eliminate discrimination are also suggested. Furthermore, modern mass media (e.g. TV, WWW, billboards, etc.) can be effective.

Half of the present participants believed they had better avoid close contact with recovered COVID-19 patients. Also, more than a half believed that they had better prevent children's close contact with the recovered patients. In their research, Lan et al. showed that at least some of the recovered COVID-19 patients still carry the virus [19]. Therefore, the avoidance behavior shown by people was not far from expectation in the present findings. However, the fact is that not all the recovered population carry the virus afterwards, and the labeling act is a kind of discriminatory attitude. These negative attitudes can be partly due to the growing pandemic, high mortality rate, rumors about the disease and inadequate knowledge of the recovered patients. Besides, though not documented, people sometimes perceive the

spread of the disease as God's reaction to human deeds, and they allow themselves to stigmatize patients or recovered patients. Thus, it is postulated that if influential figures such as religious leaders or celebrities are asked to advise people to stop the discriminatory behavior and talk in favor of recovered patients, the discriminatory behavior and social avoidance can be significantly reduced.

As the present findings showed, more than half of the participants had a discriminatory attitude to those dealing with food services, teaching, nursing and caregiving (to children or patients). In some qualitative research, one issue facing the recovered COVID-19 patients was concerns about returning to their job [4]. In a work of research by Tansey et al. [20], 17% of 117 SARS survivors managed to return to their former jobs. In the present resaerch, part of the job-related issue was due to the employers' discriminatory behavior toward the recovered patient employee. Thus, organizations are expected to make certain plans to stop this kind of job-related discrimination and replace it with supportive plans to facilitate people's return to their jobs. The recovered patients need to enjoy fair job opportunities.

As the present findings showed, those with a recovered COVID-19 patient in family or friends expressed a higher level of social avoidance and job-related discrimination. Unlike the present findings, in another study, people with a recovered COVID-19 patient in family or friends had a less discriminatory attitude. This divergence can be explained by the differing cultures and sociodemographic features of the resaerch populations [14]. It seems that a close experience of the disease in their family made the present participants better aware of the disease. They also felt so much stress and anxiety that they developed a more discriminatory attitude toward the recovered patients and showed more avoidance. It is hypothesized that if we feel more sympathy for the recovered patients and decide to communicate more with them, we can succeed in lowering social avoidance. Cheng et al. reported the positive effects of socially supporting SARS survivors on reducing distress and increasing the quality of life [21]. Abel et al. pinpointed strengthened social bonds as an effective response to the COVID-19 threat [22]. Thus, it is essential to promote friendly interpersonal relations.

In the present research, many demographic variables showed statistically significant differences in social avoidance and discriminatory attitude. Contrary to the present findings, another research did not report the significant role of demographic variables in discriminatory behavior against HIV patients. This divergence can be partly due to the differing research populations, cultures, demographic features and types of infection [18].

We found that older participants had a more tendency for social avoidance and job-related discrimination. This finding is consistent with a body of research especially on HIV and SARS [8, 23]. Contrary to the present research, in another study, discriminatory attitude was higher among youngsters towards AIDS [24]. These different findings can be explained by the different purposes of research, age distribution and type of infection. Probably, at a higher age, people perceive themselves more prone to affliction with COVID-19 and, thus, develop a stronger fear of death which can cause the discriminatory attitude. It can be argued that the elderly often find it harder to accept new conditions than the young. The

former often use social media and online sources to a lesser degree, which can affect social avoidance and job-related attitude.

The results showed a higher discriminatory attitude among female than male participants. Similarly, another study reported a more intense discriminatory attitude to recovered COVID-19 patients among women [14]. To the contrary, in another study, Jean Baptiste showed that the discriminatory attitude toward effective treatments prevailed among male nursing staff about HIV [25]. Another study revealed no statistically significant correlation between gender and discriminatory attitude toward recovered SARS patients [8]. Probably, women were faced with a stronger fear of infection and spread of the disease in the family. This could have justified the discriminatory attitude to recovered patients.

As we found, those of a higher level of education had a less discriminatory attitude. Similarly, a qualitative study showed that the highly educated had a more tolerant attitude toward the recovered COVID-19 patients. Contrary to the present findings, some other research found no association between education level and discriminatory attitude [8]. These divergent findings can be due to different purposes of research, questionnaire content, dominant cultures and the demographic features of the target populations. Arguably, often the highly educated are employed and in constant touch with colleagues. After recovery, they for sure return to their job and this can have affected their discriminatory attitude. In contrast, higher education showed to be associated with more social avoidance in the present research. Another study found no significant correlation between education and discriminatory attitude to recovered COVID-19 patients. Yet, the more educated showed more social avoidance [14].

Unlike the present findings, another study found no statistically significant association between education and social avoidance of recovered SARS patients [8]. It seems that the highly educated have a better knowledge of the risk and adverse effects of COVID-19, followed by a better understanding of the disease and a higher social avoidance of the recovered patients.

We found that discriminatory attitude was more prevalent in urban than rural areas. This finding is confirmed by some other research that reported a higher prevalence of stigmatizing and discriminatory attitudes toward HIV patients in urban than rural residents [24]. In contrast, another study found a higher prevalence of stigmatizing attitude in elderly rural residents than the urban [23]. Some other research showed that those residing in central China had more social avoidance of recovered patients as COVID-19 originated from the center of China [14]. Arguably, urban lifestyle, more travel to urban areas, highly diverse population and notifying urban residents of the infected cases (by local authorities) are the main reasons for the higher social avoidance in urban residents than the rural.

Conclusions

In the light of the present findings, we can conclude that discriminatory attitude and social avoidance of recovered COVID-19 patients are major concerns in Iran. More than half of the participants were found with a social avoidance and about half of them held a job-related discriminatory attitude toward recovered COVID-19 patients. A higher age, lower education, urbanism, high SES, employment and

femininity were found to be the main risk factors of social avoidance. The same risk factors accounted for a job-related discriminatory attitude too, except for education, as the higher education was found to be correlated with a lower job-related discriminatory attitude. It can be concluded that reducing social avoidance and job-related discriminatory attitude toward recovered COVID-19 patients requires the cooperation of several sectors. The medical sector is expected to publish accurate and clear information about the recovered patients' physical conditions to relieve people's minds. The government is supposed to plan the required supportive measures for employment and reduce the job-related discrimination as far as possible. This can help the recovered patients enjoy fair working conditions. Social communication with the recovered patients need to be encouraged too. The present findings can help state consultants and healthcare providers develop systematic interventions to improve the recovered COVID-19 patients' conditions in Iran and other countries. The present findings also help health policy makers use the most effective strategies to improve recovered patients' conditions in society.

Limitations and future directions for research

There were several limitations to this study. Firstly, the sampling was convenient in type and the majority of participants held a university degree. Thus, the generalization of results to those of a lower education or the whole population is limited. Secondly, the required data were collected through different social media (e.g. WhatsApp, telegram, Facebook, etc.). Thirdly, participation in this research was low for those above 51 years old, as they used social media far less than other age groups. Fourthly, internet access was much more limited in rural areas than the urban. Fifthly, the questionnaire completion was done as self-reports which can be accompanied by biased (socially desirable) data. Overall, the present findings cannot be generalized to other countries. More regional and international investigations are needed. Besides, there is no standard measurement instrument for social avoidance and discriminatory attitude to recovered COVID-19 patients. Thus, it is recommended that reliable and valid instruments be developed for this purpose. Finally, it is noteworthy that though social avoidance experience was not measured with a standard instrument, the evaluated statements manage to provide valuable aspects of discrimination in the target population. They can pave the way for formulating further research questions and testing the relevant hypotheses in future line of research.

Abbreviations

COVID-19: Coronavirus Disease 2019

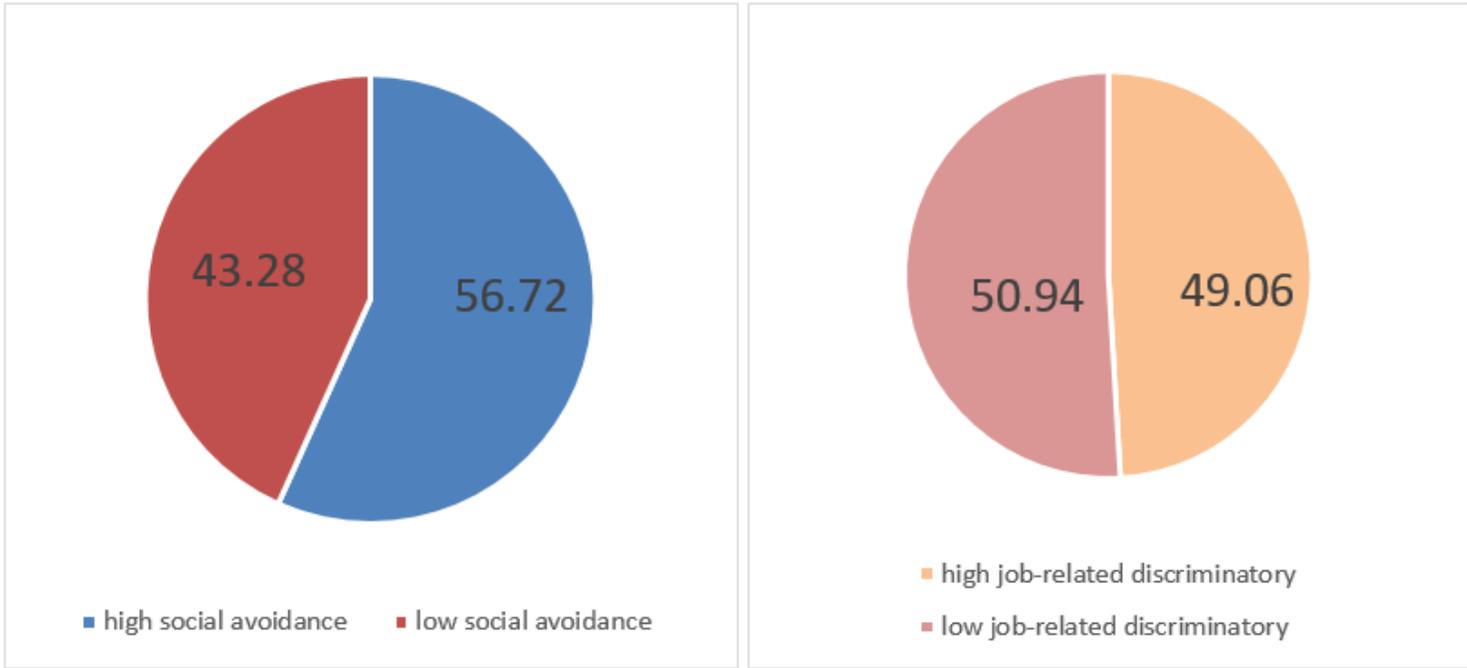SES: socio economic status

Declarations

Acknowledgements

study

References

1. Dao TL, Gautret P: Recurrence of SARS-CoV-2 viral RNA in recovered COVID-19 patients: a narrative review. *European Journal of Clinical Microbiology & Infectious Diseases* 2020:1-13.
2. Devakumar D, Shannon G, Bhopal SS, Abubakar I: Racism and discrimination in COVID-19 responses. *The Lancet* 2020, 395(10231):1194.
3. Singh R, Subedi M: COVID-19 and stigma: Social discrimination towards frontline healthcare providers and COVID-19 recovered patients in Nepal. *Asian journal of psychiatry* 2020.
4. Chen D, Song F, Cui N, Tang L, Zhang H, Shao J, Qiu R, Wang D, Wang X, Ye Z: The Perceptions and Views of Rural Residents Towards COVID-19 Recovered Patients in China: A Descriptive Qualitative Study. *International journal of general medicine* 2021, 14:709.

5. Sher L: Are COVID-19 survivors at increased risk for suicide? *Acta neuropsychiatrica* 2020, 32(5):270-270.

6. Wu C, Hu X, Song J, Yang D, Xu J, Cheng K, Chen D, Zhong M, Jiang J, Xiong W: Mental health status and related influencing factors of COVID-19 survivors in Wuhan, China. *Clinical and translational medicine* 2020, 10(2):e52.

7. Mak WW, Mo PK, Cheung RY, Woo J, Cheung FM, Lee D: Comparative stigma of HIV/AIDS, SARS, and tuberculosis in Hong Kong. *Social science & medicine* 2006, 63(7):1912-1922.

8. Lau JT, Yang X, Wong E, Tsui H: Prevalence and factors associated with social avoidance of recovered SARS patients in the Hong Kong general population. *Health education research* 2006, 21(5):662-673.

9. Lau JT, Tsui H: Surveillance of HIV/AIDS-related attitudes and perceptions among the general public in Hong Kong from 1994 to 2000. *AIDS education and prevention* 2002, 14(5):419-431.

10. Yoseph A, Tamiso A, Ejeso A: Knowledge, attitudes, and practices related to COVID-19 pandemic among adult population in Sidama Regional State, Southern Ethiopia: A community based cross-sectional study. *PloS one* 2021, 16(1):e0246283.

11. Abebe H, Shitu S, Mose A: Understanding of COVID-19 Vaccine Knowledge, Attitude, Acceptance, and Determinates of COVID-19 Vaccine Acceptance Among Adult Population in Ethiopia. *Infection and Drug Resistance* 2021, 14:2015.

12. Cassiani-Miranda CA, Campo-Arias A, Tirado-Otálvaro AF, Botero-Tobón LA, Upegui-Arango LD, Rodríguez-Verdugo MS, Botero-Tobón ME, Arismendy-López YA, Robles-Fonnegra WA, Niño L: <?covid19?> Stigmatisation associated with COVID-19 in the general Colombian population. *International Journal of Social Psychiatry* 2020:0020764020972445.

13. Miconi D, Li ZY, Frounfelker RL, Venkatesh V, Rousseau C: Socio-cultural correlates of self-reported experiences of discrimination related to COVID-19 in a culturally diverse sample of Canadian adults. *International Journal of Intercultural Relations* 2021, 81:176-192.

14. Liu R, Nicholas S, Leng A, Qian D, Maitland E, Wang J: The influencing factors of discrimination against recovered Coronavirus disease 2019 (COVID-19) patients in China: a national study. *Human Vaccines & Immunotherapeutics* 2021:1-9.

15. Dadipoor S, Mirzaei-Alavijeh M, Aghamolaei T, Heyrani A, Ghaffari M, Ghanbarnejad A: Predictors of hookah smoking frequency among women in the South of Iran: A cross-sectional study. *Journal of ethnicity in substance abuse* 2020:1-19.

16. Melki I, Beydoun H, Khogali M, Tamim H, Yunis K: Household crowding index: a correlate of socioeconomic status and inter-pregnancy spacing in an urban setting. *Journal of Epidemiology & Community Health* 2004, 58(6):476-480.

17. Pai MYB, Park ASH, Chen BFL, Toma JT, Pai HJ: Health Complications in Patients Recovering from COVID-19: A Narrative Review of Post-COVID Syndrome. *Journal of Advances in Medicine and Medical Research* 2021:115-129.

18. Tavakoli F, Karamouzian M, Rafiei-Rad AA, Iranpour A, Farrokhnia M, Noroozi M, Sharifi A, Marshall BD, Shokoohi M, Sharifi H: HIV-Related stigma among healthcare providers in different healthcare settings: a cross-sectional study in Kerman, Iran. *International journal of health policy and management* 2020, 9(4):163.

19. Lan L, Xu D, Ye G, Xia C, Wang S, Li Y, Xu H: Positive RT-PCR test results in patients recovered from COVID-19. *Jama* 2020, 323(15):1502-1503.

20. Tansey CM, Louie M, Loeb M, Gold WL, Muller MP, de Jager J, Cameron JI, Tomlinson G, Mazzulli T, Walmsley SL: One-year outcomes and health care utilization in survivors of severe acute respiratory syndrome. *Archives of internal medicine* 2007, 167(12):1312-1320.

21. Cheng SK, Sheng B, Lau KK, Wong CW, Ng YK, Li HL, Chan EL, Tso EY, Lam K, Chau TN: Adjustment outcomes in Chinese patients following one-month recovery from severe acute respiratory syndrome in Hong Kong. *The Journal of nervous and mental disease* 2004, 192(12):868-871.

22. Abel T, McQueen D: The COVID-19 pandemic calls for spatial distancing and social closeness: not for social distancing! In.: Springer; 2020.

23. Li X, Yuan L, Li X, Shi J, Jiang L, Zhang C, Yang X, Zhang Y, Zhao D, Zhao Y: Factors associated with stigma attitude towards people living with HIV among general individuals in Heilongjiang, Northeast China. *BMC infectious diseases* 2017, 17(1):1-6.

24. Letamo G: Prevalence of, and factors associated with, HIV/AIDS-related stigma and discriminatory attitudes in Botswana. *Journal of Health, Population and Nutrition* 2003:347-357.

25. Jean-Baptiste R: HIV/AIDS-related stigma, fear, and discriminatory practices amongst healthcare providers in Rwanda. *Operations Research Results Published for the US Agency for International Development (USAID) by the Quality Assurance Project* 2008.
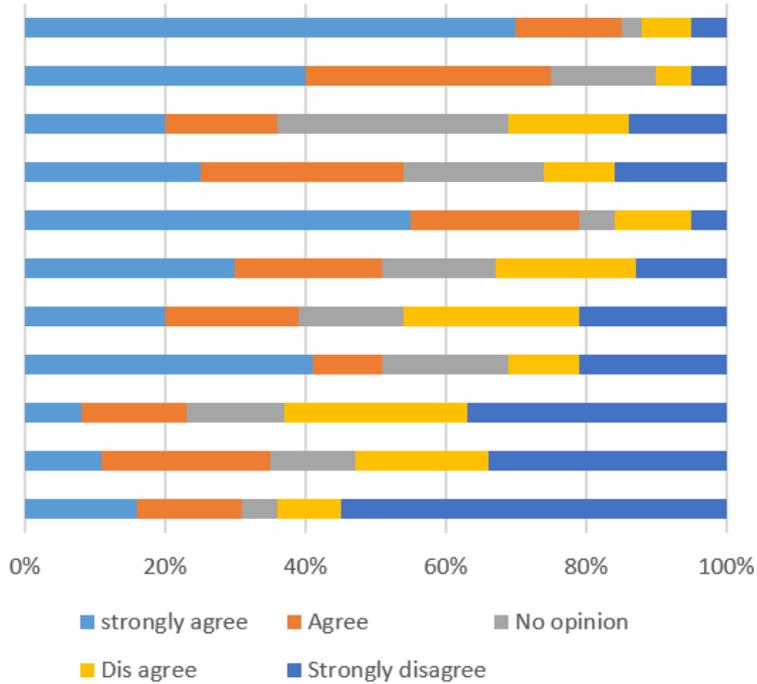
Figures

Figure 1

Social avoidance and job-related discriminatory attitude

Figure 2

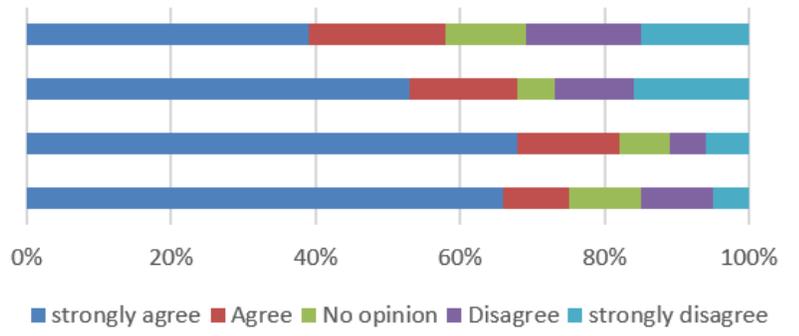Social avoidance of recovered COVID-19 patients

Figure 3

Job-related discriminatory attitude to recovered COVID-19 patients