



ORIGINAL ARTICLE

COVID-19 perceived stigma among survivors: A cross-sectional study of prevalence and predictors

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Abstract

Background and objectives: Perceived stigma related to infectious diseases is of public health importance and can adversely impact patients' physical and mental health. This study aims to identify the level of perceived stigma among COVID-19 survivors in Qatar and investigate its predictors.

Methods: An analytical cross-sectional design was employed. Four hundred and four participants who had a positive COVID-19 PCR test were randomly selected from medical records. The selected participants were interviewed to collect sociodemographic and health-related information. Perceived stigma was assessed using the COVID-19 perceived stigma scale-22 (CPSS-22) that was developed by the researchers. A descriptive analysis followed by a bivariate analysis investigated possible associations between the perceived stigma levels and independent variables. A multivariable analysis was performed using logistic regression to identify any significant associations with perceived stigma. The validity and reliability of the developed tool were also tested.

Results: The prevalence of COVID-19 perceived stigma was twenty-six percent ($n = 107$, 26.4%) at 95% CI [22.4–30.4]. Factors associated with higher COVID-19 perceived stigma were male gender, being a manual worker, non-Arabic ethnicity, low educational level, living alone, and being isolated outside the home. However, only occupation, ethnicity, and low educational level predicted COVID-19 perceived stigma in multivariable analysis. The CPSS-22 showed excellent reliability (Cronbach's alpha 0.92).

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Conclusion: Perceived stigma was relatively common among participants. Designing programs and interventions targeting male manual workers and those of low-educational levels may assist policymakers in mitigating the stigma related to COVID-19.

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Introduction

Coronavirus disease 2019 (COVID-19) is caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) that was first identified in December 2019 in Wuhan, Hubei, China. It was declared an alarming pandemic by the World Health Organisation on March 11, 2020.¹ The disease severity ranges from mild (no or mild pneumonia) to severe (with dyspnoea, hypoxia, and extensive lung involvement on imaging).² The COVID-19 pandemic has brought challenges to public health, not only at the physical health level but also mental health wellbeing.³ One element of the pandemic's impact is stigma, whether public stigma or self-perceived stigma.⁴

Historically, the term 'stigma' was first used by the Greeks to describe an identifiable bodily sign of shame worn by or burnt into the body of slaves or people who were believed to be immoral to let them be recognized and humiliated in public.⁵ Throughout history, epidemics and pandemics of infectious diseases have been associated with stigma toward infected people or specific ethnic or social groups.⁴ For example, in the early 1900s, Chinese immigrants faced widespread racism during the initial time of the Chinatown plague.⁶ Similarly, Native Americans suffered from stigmatization during the 1993 outbreak of Hantavirus in the United States. The disease was initially called a Navajo disease, referring to the Native American people of the Southwestern United States.⁷ Perceived stigma related to communicable diseases can negatively affect patients.⁸ It may sometimes be more devastating than the disease itself. It could be a barrier to seeking testing for COVID-19 or its treatment and hence preventing the needed timely intervention, quarantine, or treatment.⁹ For instance, during the SARS outbreak in 2003, discrimination against Asians in the United States dramatically affected the care-seeking behaviors and the mental health of many people of Asian origin.¹⁰ When a disease contraction is potentially controllable by individuals - as in the case of COVID-19, the general public will still likely blame the infected individuals for being responsible for getting infected.¹¹

It has been suggested in the available literature that stigma, which may be perceived by COVID-19 survivors, has negative impacts on multiple aspects of the survivors' wellbeing.^{12,13} A recently published study assessed the sleep quality among COVID-19 survivors and its association with perceived self-stigma and affiliate stigma.¹⁴ The study found that survivors who perceived stronger self-stigma and perceived affiliate stigma reported poorer sleep quality. The indirect effect of perceived self and affiliate stigma on sleep quality through social support and resilience was significant. Moreover, Ju et al. 2022 reported an association between stigma among COVID-19 survivors and social anxiety in their study.¹⁵

According to Berger et al.¹⁶ perceived stigma associated with an infectious disease occurs in the context of two

factors: the individuals' perception of societal attitudes toward them, and their knowledge of being infected with an infectious disease. The central concept of perceived stigma is about the person's awareness of actual or potential social disqualification. Reinius et al. 2017, in their development of a scale to measure stigma among HIV patients, relied on Berger's classification of stigma into four domains: personalized stigma, disclosure concerns, concerns with public attitudes, and negative self-image.¹⁷ In this study, we adopted the same subscales in developing our measurement tool for stigma among COVID-19 survivors.

Stigma associated with COVID-19 may unevenly affect specific individuals or groups of people more than others. Stigma can occur when, regardless of the cause, a link between the disease itself and a particular population or nationality is established. In addition, after recovery from COVID-19 and being released from isolation, stigma may still occur or continue to exist.¹⁸ A recent study conducted in China comparing perceived stigma among COVID-19 survivors and healthy controls concluded that perceived COVID-19 stigma was higher among survivors.¹⁹

Globally, little is known about perceived stigma in COVID-19 survivors. Qatar is a small country situated on the west coast of the Arabian Peninsula. The population of 2.9 million, of whom 90% are expatriate workers with a median age of 32 years.²⁰ The first confirmed case of COVID-19 in Qatar was detected in February 2020.²¹ The number of cases rapidly increased with the first wave peaking in late May 2020 before falling during June and July 2020. From August 2020, the infection rate remained relatively low until February 2021 when a second wave began which lasted until mid-June 2021. Since then, the number of daily new COVID-19 cases has been fairly stable and for the most part under 200 cases per day.²² The data reported in this study were collected between June to August 2021. During this period, much of life in Qatar mirrored the pre-pandemic situation with most schools, shops, and mosques being open, public transport running normally, and most workers having returned from home to office working. *Ehteraz*, a smartphone contact tracing app, remained in use and the wearing of masks in public continued; both had become an accepted part of everyday life. Qatar's Ministry of Public Health (MOPH) registered 239,508 confirmed cases and 611 deaths as of November 2021.²³ The Qatari government has managed the pandemic effectively through a combination of approaches including a comprehensive COVID-19 vaccination program, the *Ehteraz* contact tracing app, lockdown measures, strict control on the entry of travelers to the country, and compulsory wearing of facemasks in public.

To the best of our knowledge, this is the first study to assess the level of perceived stigma among individuals who had been infected or recovered from COVID-19 in the State of Qatar. Determination of the level of stigma and its determinants will inform policymakers of the actual burden in

Qatar and assist them in designing targeted programs and interventions to mitigate the stigma related to COVID-19. Therefore, we conducted a study to identify the level of perceived stigma among COVID-19 survivors in Qatar and investigate its determinants.

Methods

Study design

An analytical cross-sectional study design was employed.

Source of data

Data for this study were obtained from the electronic medical record system of the Hamad Medical Corporation (HMC), which is Qatar's largest secondary and tertiary health care provider. All COVID-19 RT-PCR tests are performed in HMC laboratories. The list of all patients who met the inclusion criteria was obtained from the electronic medical record system. The study protocol was approved by the Institutional Review Board of the Hamad Medical Corporation.

Study population

Our study population was COVID-19 survivors. We defined 'survivors' as those with a history of being infected with and had recovered from COVID-19. The definition of infection was having a positive RT-PCR test for COVID-19, and the definition of recovery from COVID-19 was based on the updated guidelines for discontinuing isolation for hospitalized and non-hospitalized patients issued by the Center for Disease Control and Prevention (CDC): "20 days have passed since symptoms first appeared and at least 24 h have passed since last recorded fever (temperature at or over 37.5 °C) without the use of fever-reducing medications".^{24,25}

Inclusion criteria included individuals who: (1) met the definition of 'recovery', (2) were 18 years of age or over, (3) and could speak and comprehend either Arabic or English language. Pregnant women were excluded.

Sample size, sampling method, and recruitment procedure

The sample size was determined based on the assumption of a prevalence of 50% and a margin of error of 5%; the minimum required sample size was determined to be 384. An adjustment of 50% non-response rate was applied resulting in a total sample size of 576.²⁶ Potential participants were selected randomly from the list of total individuals using a random sampling technique through Microsoft Excel until we reached a sample size of 404.

The selected participants were contacted by telephone by two of the researchers (MA and KA) following an intensive training in the use of the data collection method and the tools. The potential candidates were explained the purpose and nature of the study and were asked whether they consented to participate. Those who provided verbal consent were screened about the last time they had a fever and fever-reducing medications. Those who were eligible were

enrolled in the study and were interviewed during the same telephone call.

Variables and definitions

Dependent variable (perceived COVID-19 stigma)

The World Health Organization (WHO) defines stigma as a label of shame, disapproval, or disgrace that results in the rejection of an individual, discrimination against them, and the exclusion from participating in the different areas of society.²⁷ This variable was measured through the developed COVID-19 perceived stigma scale.

2.5.1.1. COVID-19 perceived stigma scale (CPSS-22). Due to the novelty of COVID-19 and the absence of validated tools used to assess perceived stigma among COVID-19 in Qatar, we developed a COVID-19 perceived stigma tool in Arabic and English. The tool was developed based on the literature review and informed by previously available validated tools to assess perceived stigma in other health conditions such as Berger's HIV stigma Scale,¹⁶ Cataldo's Lung Cancer Stigma Scale,²⁸ and Fife and Wright's Social Impact Scale (SIS).²⁹ The CPSS-22 consists of 22 questions categorized into four domains: disclosure concerns, public attitudes, negative self-image, and personalized stigma. When an item was adapted from another scale, the wording was adapted for use with COVID-19 patients. For example, the statement: "having HIV makes me feel unclean" was changed to "having COVID-19 makes me feel unclean". Each item of the tool was given a score ranging from strongly disagree (0) to strongly agree (3) on a four-point Likert scale. Thus, the total score could potentially range between 0 and 66, with higher scores indicating higher levels of perceived stigma. The CPSS-22 assessed the COVID-19 perceived stigma among survivors after they recovered and at the time they were interviewed.

Independent variables

Sociodemographic factors included participants' age, gender, nationality, education level, marital status, employment status, whether lived alone or with family, friends, or co-workers, and occupation. Health-related factors included disease severity, chronic diseases, duration between diagnosis and declared recovery in days, and duration of isolation and its setting. These variables were assessed through a questionnaire developed by the researchers.

2.5.2.1. Sociodemographic and health-related questionnaire. We developed a questionnaire in both Arabic and English languages. It includes 15 items categorized into two groups; (i) participants' sociodemographic characteristics, and (ii) disease-related factors, including disease severity (derived from the WHO's clinical progression scale).³⁰

Validation of the CPSS-22

Face validity

The research team developed the background questionnaire and the CPSS-22 following a comprehensive review of the literature, consultation with community medicine faculty, and experts in the field of psychiatry to establish its face validity. The initial scale included 23 items. Four judges (M.A., S.N., K.A., and V.K.) agreed to exclude one item and to include the remaining 22 items. We computed Fleiss's kappa to

measure the reliability of agreement among four multi-raters³¹ after rating each item through applying three categorical ratings: (i) not necessary, (ii) useful but not essential, and (iii) essential. The overall inter-rater agreement was 91.3%, and Fleiss's k was 0.56, indicating a fair to good agreement.³²

Translation validity

Translation validity was established by translating the English version of the data collection tools into Arabic by two native Arabic speakers and then translating back into English to ensure consistency. Any disagreement between the two translators was solved by discussion. Then the final version was agreed upon by all authors.

Content validity

Content validity of the CPSS-22 was ensured through a panel of four experts. Using Lawshe's method,³³ each item was rated for its importance and relevance by applying a three-categorical rating: (i) not necessary, (ii) useful but not essential, and (iii) essential. By counting only the items rated as essential, the scale content validity index (S-CVI) was 0.86 which is considered high content validity,³⁴ as shown in Table 1.

Statistical analysis

The database was constructed and analyzed using the Statistical Package for Social Sciences (SPSS)TM Software Version 25. Descriptive analysis was performed and data were presented as frequencies and percentages for categorical variables and mean $\pm$ standard deviation (S.D.) for continuous

variables. The dependent outcome, the CPSS-22 score, was dichotomized based on the 75th percentile, corresponding to a cut-off score of 24. Scores below 24 were considered to indicate a low level of COVID-19 perceived stigma, and scores of 24 and above indicated moderate-to-high levels. Choosing quartiles to categorize participants into two groups (the upper 25% and the rest of the CPSS-22 scores) was used before in studies assessing the psychological burden of stigma among Middle East Respiratory Syndrome (MERS) and COVID-19 patients using an adjusted version of the MERS stigma scale.^{12,13} To identify significant associations, a Chi-square test was done, followed by a binary logistic regression to identify potential predictors of COVID-19 perceived stigma. The selection of independent variables included in the model was based on the available literature and statistical relevance. Adjusted odds ratios and 95% C.I.s were used to present the associations between risk factors and outcomes. The goodness of fit was assessed using Hosmer and Lemeshow test. P -values less than 0.05 were considered significant. In the end, reliability testing through Cronbach alpha was done to examine the internal consistency of the CPSS-22.

Results

Sample realization

During the data collection period from June to August 2021, 576 participants who met the inclusion criteria were randomly extracted from their medical records. We began to contact potential participants randomly until 404 positive

Table 1 CPSS-22 content validity assessment by Lawshe's method.

	Expert 1	Expert 2	Expert 3	Expert 4	CVR
Item 1	x	x	X	x	1
Item 2	x	x	X	x	1
Item 3	x	x	X	x	1
Item 4	x	x	X	x	1
Item 5	x	x	X		0.5
Item 6	x	x	X		0.5
Item 7			X		-0.5
Item 8	x	x	X	x	1
Item 9	x	x	X	x	1
Item 10	x	x	X	x	1
Item 11	x	x	x	x	1
Item 12	x	x	x	x	1
Item 13	x	x	x	x	1
Item 14	x	x	x	x	1
Item 15	x	x	x	x	1
Item 16	x	x	x		0.5
Item 17	x	x	x	x	1
Item 18	x	x	x	x	1
Item 19	x	x	x	x	1
Item 20	x	x	x	x	1
Item 21	x	x	x	x	1
Item 22	x	x	x	x	1
S-CVI					0.864

CVR, Content Validity Ratio; S-CVI, Scale Content Validity Index.

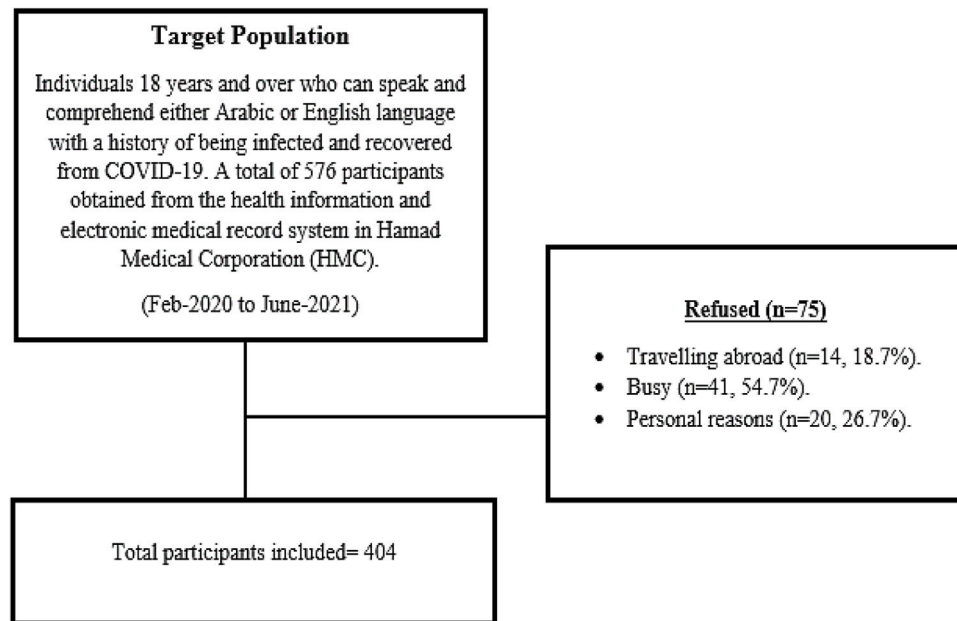


Fig. 1 Flow chart of the participants.

responses were achieved. Of those who were approached, 75 participants refused to participate due to various reasons. The non-response rate showed to be 15.6%, as seen in Fig. 1.

Participants' characteristics

The age of the participants ranged between 18 and 71 years (median age 38, IQR 31–46), and the mode recorded was 30 years. Most of the participants were married ($n = 313, 77.5\%$) from 41 nationalities, most being non-Qatari ($n = 366, 90.6\%$). The predominating nationalities were Filipino ($n = 59, 14.6\%$) and Indian ($n = 54, 13.4\%$). Furthermore, most of the participants had a university or college degree ($n = 173, 42.8\%$) and the majority were employed ($n = 348, 86.1\%$). The highest distribution of the occupation was among professionals ($n = 186, 46\%$), followed by manual workers ($n = 95, 23.5\%$). The participants' COVID-19 diagnosis dates ranged between March 1st, 2020 and June 6th, 2021. The duration between the diagnosis and the interview ranged between 4 and 70 weeks, with a mean of 32.7 ± 19.6 weeks. The average isolation duration was 16 days (± 5 days), and the mode was 14 days. In terms of the disease severity, most participants had symptomatic disease, but they could be independent during the disease course ($n = 239, 59.2\%$), followed by those who were asymptomatic ($n = 83, 20.5\%$). Most did not report having a chronic physical illness ($n = 308, 76.2\%$). Among those who reported having a chronic physical illness, hypertension and diabetes mellitus were the most reported illnesses ($n = 48, 11.9\%$) and ($n = 45, 11.1\%$), respectively, as seen in Table 2

COVID-19 perceived stigma

The participants had a mean CPSS-22 score of 15.4 ± 10.8 with the range of the scores being between 0 and 47. We found that 107 participants (26.4% at 95% CI: 22.4–30.4) expressed a moderate to high level of perceived COVID-19 stigma ($\geq$ the 75th percentile). The disclosure concerns

domain had the highest percentage of participants scoring $\geq$ the 75th percentile ($n = 168, 41.6\%$), followed by the personalized stigma domain, where 143 (35.4%) participants scored $\geq$ the 75th percentile. For the public attitude and the negative self-image domains, 134 (33.2%) and 105 (26.0%) participants scored $\geq$ the 75th percentile, respectively. The most agreed-upon statement by the participants was "I feel my body failed me because I got infected with COVID-19" with 22.0% agreeing and 9.2% strongly agreeing. This was followed by "I feel people are avoiding direct contact with me like touching" with 20.0% agreeing and 8.4% strongly agreeing as shown in Table 3.

Factors associated with COVID-19 perceived stigma

By using the 75-percentile cut-off point corresponding to a CPSS-22 score of 24, it was found that males, non-Qataris, non-Arabs, those with low education level (no formal education, primary or intermediate school degree), and manual workers were more likely to have moderate-to-high COVID-19 perceived stigma with p -values of 0.002, 0.006, <0.001, 0.019, <0.001, respectively. In addition, living alone and being isolated in a non-home setting (hospital or isolation facility) during the COVID-19 infection were associated with an increased tendency to have a moderate-to-high level of COVID-19 perceived stigma (p -values of 0.001 and <0.001, respectively) (Table 4).

Predictors of COVID-19 perceived stigma

Logistic regression was carried out to assess the effects of several independent variables on the likelihood of having a moderate-to-high perceived stigma level (CPSS-22 score ≥ 24). The selection of independent variables included in the model was based on the available literature and statistical relevance. The included independent variables in the model were: gender, ethnicity, marital status, education level, occupation, living situation, and isolation setting during the

Table 2 Characteristics of Participants (N = 404).

Characteristic	n	%
Gender		
Male	285	70.5
Female	119	29.5
Age		
20–29	64	15.8
30–39	151	37.4
40–49	116	28.7
≥50	73	18.1
Nationality		
Qatari	38	9.4
Non-Qatari	366	90.6
Ethnicity		
Arab*	209	51.7
Non-Arab**	195	48.3
Educational Level		
No formal education	13	3.2
Primary	7	1.7
Intermediate	27	6.7
Secondary	121	30
Some college or technical school	62	15.3
College or University degree or higher	173	42.8
Missing	1	0.2
Marital Status		
Married	313	77.5
Single	90	22.3
Missing	1	0.2
Employment status		
Employed	348	86.1
Not employed	51	12.6
Retired	5	1.2
Occupation		
Professional	186	46
Manual	95	23.5
Business people	48	11.9
Military/ police	20	5
Living situation		
Alone	84	20.8
With family	262	64.9
Sharing accommodation with friends	34	8.4
Sharing accommodation with co-workers	24	5.9
Isolation setting during COVID-19 infection		
Home isolation	161	39.9
Hotel isolation	55	13.6
Hospital-not ICU	44	10.9
Hospital-ICU	5	1.2
Government isolation facility	139	34.4
Severity of COVID-19 infection		
Asymptomatic	83	20.5
Symptomatic but independent	239	59.2
Symptoms that required help from others	39	9.7
Hospital admission - no oxygen required	28	6.9

Table 2 (Continued)

Characteristic	n	%
Hospital admission - needed oxygen therapy but no mechanical ventilation	11	2.7
Hospital admission - needed mechanical ventilation	4	1
Presence of chronic physical illness***		
Yes	96	23.8
No	308	76.2

* Includes Egyptian, Qatari, Sudanese, Yemeni, Palestinian, Jordanian, Syrian, Tunisian, Lebanese, Algerian, Moroccan, Iraqi, Omani, Saudi Arabian, Bahraini, Emirati, Libyan, and Somali.

** The majority of non-Arab participants were Filipinos ($n = 59$, 14.6%) and Indians ($n = 54$, 13.4%).

*** Physical illness with a duration of more than 3 months prior to the interview ICU, Intensive Care Unit; n, frequency; %, percentage; N, total sample.

COVID-19 infection. The logistic regression model was statistically significant ($p < 0.001$) when compared to the null model with a chi-square value (χ^2) of 86.2. Our data showed no multicollinearity; the computed Variance Inflation Factor (VIF) was below 1.3. The model explained 31.8% (Nagelkerke R^2) of the outcome variable (perceived stigma) and correctly predicted 81.3% of cases. To assess the goodness of fit of our model, the Hosmer and Lemeshow test was performed, and it indicated that our model fits the data better than the null model.

Compared to participants of Arab ethnicity, non-Arabs were significantly more likely to have higher levels of perceived stigma (perceived stigma score ≥ 24) with a p -value < 0.001 and an adjusted odds ratio of (5.37, 95%CI: 2.79–10.32). Education level demonstrated a significant protective effect against developing perceived stigma ($p = 0.02$). Participants with a secondary school degree or higher had an adjusted odds ratio of 0.36 (95%CI: 0.15–0.85) compared with those with lower formal education levels. Occupation type was significantly associated with higher levels of perceived stigma ($p = 0.001$); compared to professional workers (including business people, police, and military personnel), manual laborers were more likely to express higher stigma levels with an adjusted odds ratio of 2.58 (95%CI: 1.46–4.56). Those who lived alone did not have a statistically significant increased adjusted odds ratio of having stigma than those living with family, friends, or co-workers ($p = 0.464$). Finally, participants' gender, marital status, and setting of isolation during COVID-19 infection variables showed no statistically significant association with the level of perceived stigma according to the model with p -values of 0.12, 0.34, and 0.10, respectively, as shown in Table 5.

Reliability of the CPSS-22

The Cronbach's alpha coefficient values for the disclosure of concern, public attitude, negative self-image, and personalized stigma domains were 0.64, 0.77, 0.84, and 0.84,

Table 3 Participants answers to CPSS-22 items.

Item	Answers			
	Strongly Disagree n (%)	Disagree n (%)	Agree n (%)	Strongly Agree n (%)
Disclosure Concerns				
I feel I need to hide (or keep secret) that I had COVID-19	223 (55.2)	142 (35.1)	30 (7.4)	9 (2.2)
I worry that people who know I had COVID-19 will tell others	206 (51.0)	136 (33.7)	46 (11.4)	16 (4.0)
People infected with COVID-19 will lose their jobs when their employer knows	206 (51.0)	119 (29.5)	68 (16.8)	11 (2.7)
Total disclosure concerns domain mean = 1.96 ± 1.8 , median = 2, range = 0–7.0				
Concerns with Public Attitudes				
I feel some people act as if I am less competent than usual	192 (47.5)	158 (39.1)	45 (11.1)	9 (2.2)
I feel others are treating me with less respect than usual	218 (54.0)	138 (34.2)	38 (9.4)	10 (2.5)
I believe that people are talking behind my back	158 (39.1)	146 (36.1)	76 (18.8)	24 (5.9)
I feel I am being blamed for not taking preventive measures	158 (39.1)	130 (32.2)	86 (21.3)	30 (7.4)
I feel people are not comfortable being around me	164 (40.6)	154 (38.1)	70 (17.3)	16 (4.0)
I feel people are avoiding direct contact with me like touching	155 (38.4)	134 (33.2)	81 (20.0)	34 (8.4)
Total concerns with public attitudes domain mean = 5.0 ± 3.5 , median = 5, range = 0–18.0				
Negative Self-Image				
Having COVID-19 makes me feel unclean	228 (56.4)	138 (34.2)	31 (7.7)	7 (1.7)
I feel less competent than I did before my illness	196 (48.5)	132 (32.7)	69 (17.1)	7 (1.7)
I feel guilty because I had COVID-19	194 (48.0)	145 (35.9)	46 (11.4)	19 (4.7)
People's attitudes make me feel worse about myself	205 (50.7)	164 (40.6)	28 (6.9)	7 (1.7)
I feel embarrassed that I was infected with COVID-19	209 (51.7)	150 (37.1)	39 (9.7)	6 (1.5)
I feel my body failed me because I got infected with COVID-19	167 (41.3)	111 (27.5)	89 (22.0)	37 (9.2)
Total negative self-image domain mean = 4.1 ± 3.5 , median = 4, range = 0–18.0				
Personalized Stigma				
My feeling of job security has been affected by my illness	203 (50.2)	122 (30.2)	69 (17.1)	10 (2.5)
I feel some family members have rejected me because of my illness	255 (63.1)	129 (31.9)	19 (4.7)	1 (0.2)
I feel some friends have rejected me because of my illness	231 (57.2)	144 (35.6)	25 (6.2)	4 (1.0)
Most people believe a person with COVID-19 is dirty	189 (46.8)	150 (37.1)	57 (14.1)	8 (2.0)
I feel worried about how people look at me	211 (52.2)	139 (34.4)	46 (11.4)	8 (2.0)
I feel isolated more often than usual from friends and relatives	197 (48.8)	151 (37.4)	40 (9.9)	16 (4.0)
I stopped socializing with friends and relatives because of fear of their reactions.	224 (55.4)	137 (33.9)	36 (8.9)	7 (1.7)
Total personalised stigma domain mean = 4.2 ± 3.7 , median = 4, range = 0–19.0.				
Total COVID-19 perceived stigma scale mean = 15.4 ± 10.8 , median = 15, range = 0–47.0.				
n, frequency; %, percentage; means are expressed as mean $\pm$ standard deviation				

respectively. The overall Cronbach's alpha coefficient value for the 22 items was 0.92 indicating excellent reliability.³⁵

Discussion

Several studies have assessed the public stigma toward patients with COVID-19,^{36–39} but only a few have explored the self-perceived stigma among the patients or survivors themselves. Assessing perceived stigma is crucially important since it could lead patients to hide their symptoms and consequently affect their care-seeking behaviors.⁸ Furthermore, perceived stigma from infectious diseases could lead

to increased risks of depression, anxiety, and posttraumatic stress disorder among survivors.^{12,13} A study conducted early in the pandemic found that COVID-19 patients may have higher levels of depression, anxiety, and stress compared to healthy controls.⁴⁰ This could further complicate the relationship between stigma perception and other psychological impacts of the pandemic on survivors. Our study assessed the perceived stigma related to COVID-19 among those who were infected and recovered from the disease in Qatar. Our findings showed that the prevalence of moderate-to-high levels of COVID-19 perceived stigma in Qatar among survivors was 26.4% ($n = 107$) at 95% CI [22.4–30.4]. A recent study that assessed stigma among 174 recently recovered

Table 4 COVID-19 perceived stigma and its association with the participants' characteristics.

	COVID-19 perceived stigma		χ^2 ; (<i>p</i> -value)	OR; [95%CI]
	Moderate to high <i>n</i> (%)	Low <i>n</i> (%)		
Gender				
Male	88 (30.9)	197 (69.1)	9.5; (0.002)	0.42; [0.24-0.73]
Female	19 (16.0)	100 (84.0)		
Nationality				
Qatari	3 (7.9)	35 (92.1)	7.4; (0.006)	4.63; [1.39-15.38]
Non-Qatari	104 (28.4)	262 (71.6)		
Ethnicity				
Arab	21 (10.0)	188 (90.0)	60.0; (<0.001)	7.06; [4.14-12.02]
Non-Arab	86 (44.1)	109 (55.9)		
Educational Level				
Low	19 (40.4)	28 (59.6)	5.4; (0.019)	0.47; [0.25-0.89]
Moderate to high	87 (24.4)	269 (75.6)		
Marital Status				
Married	85 (27.2)	228 (72.8)	0.2; (0.608)	0.86; [0.50-1.49]
Not married	22 (24.4)	68 (75.6)		
Employment status				
Employed	97 (27.9)	251 (72.1)	2.4; (0.115)	0.56; [0.27-1.15]
Not employed	10 (17.9)	46 (82.1)		
Occupation				
Professionals*	48 (18.9)	206 (81.1)	36.7; (<0.001)	4.57; [2.74-7.61]
Manual workers	49 (51.6)	46 (48.4)		
Living situation				
Alone	34 (40.5)	50 (59.5)	10.6; (0.001)	0.43; [0.26-0.72]
With others (family, friends, or co-workers)	73 (22.8)	247 (77.2)		
Isolation setting during COVID-19 infection				
Home isolation	27 (16.8)	134 (83.2)	12.9; (<0.001)	2.43; [1.48-3.98]
Non-home isolation	80 (32.9)	163 (67.1)		
Isolation duration				
>14 days	28 (21.2)	104 (78.8)	2.8; (0.09)	1.52; [0.92-2.48]
≤14 days	79 (29.0)	193 (71.0)		
Severity of COVID-19 infection				
Severe**	15 (18.3)	67 (81.7)	3.5; (0.06)	1.78; [0.97-3.28]
Mild to moderate	92 (28.6)	230 (71.4)		
Presence of chronic physical illness				
Yes	19 (19.8)	77 (80.2)	2.8; (0.08)	0.61; [0.35-1.08]
No	88 (28.6)	220 (71.4)		

* Includes business people, military, and police.

** Includes those with symptoms that required help from others, admitted to a hospital, needed oxygen therapy or mechanical ventilation. *n*, frequency; %, percentage; χ^2 , Chi-square statistic, OR: Odds Ratio, CI, Confidence Interval.

COVID-19 patients in Saudi Arabia found that the level of stigma among the participants was low.⁴¹ A possible explanation for this discrepancy may be the different scales used to assess COVID-19 stigma in other studies which limits the ability to compare our findings. Nevertheless, a recent article published from Wuhan, China, revealed that the average perceived-stigma level among infected COVID-19 patients in secondary care hospitals was moderate in the early stage of the pandemic⁴²; but, no clear explanation of the meaning of a moderate level of stigma was provided based on the scale used. Also, in that study, they excluded participants with chronic or mental illnesses.

In principle, the results of our study are in line with those obtained from studies that evaluated stigma in survivors of other infectious disease outbreaks such as SARS and Ebola.⁴³ An extensive meta-analysis of 50 articles that assessed the

prevalence of stigma in multiple infectious diseases, including COVID-19,⁴⁴ estimated that the pooled stigma prevalence across all included studies was 34% which is slightly higher than ours (26.4%). However, in the same meta-analysis, the pooled prevalence obtained from studies assessing perceived stigma specifically and in high-income countries were 31% and 27%, respectively, which are closer to our results and more comparable with our outcome and study setting.

We found that the highest domain with a percent of participants scoring $\geq$ the 75th percentile was the disclosure concerns domain (41.6%), which is concerning given that disclosure is an essential component for the prevention, treatment, and contact tracing of infectious diseases.⁴⁵ A qualitative study aimed to explore COVID-19 patients' experiences of disclosing their illness in China found that the

Table 5 Predictors of COVID-19 perceived stigma as identified by logistic regression analysis.

Variable	No. of participants with moderate to high level of COVID-19 perceived stigma (%)	Beta coefficient	AOR (95% CI)	p-value
Gender		-0.606		0.123
Male (<i>n</i> = 285)	88 (30.9)		1 [reference]	
Female (<i>n</i> = 119)	19 (16.0)		0.54 (0.25-1.17)	
Ethnicity		1.682		<0.001
Arab (<i>n</i> = 209)	21 (10.0)		1 [reference]	
Non-Arab (<i>n</i> = 195)	86 (44.1)		5.37 (2.79-10.32)	
Marital Status		-0.340		0.342
Married (<i>n</i> = 313)	85 (27.2)		1 [reference]	
Not married (<i>n</i> = 90)	22 (24.4)		0.71 (0.35-1.43)	
Educational Level		-1.012		0.021
Low (<i>n</i> = 47)	19 (40.4)		1 [reference]	
Moderate to high (<i>n</i> = 356)	87 (24.4)		0.36 (0.15-0.85)	
Occupation		0.951		0.001
Professionals* (<i>n</i> = 254)	48 (18.9)		1 [reference]	
Manual workers (<i>n</i> = 95)	49 (51.6)		2.58 (1.46-4.56)	
Living situation		-0.223		0.464
Alone (<i>n</i> = 84)	34 (40.5)		1 [reference]	
With others (family/friends/co-workers) (<i>n</i> = 320)	73 (22.8)		0.80 (0.44-1.45)	
Isolation setting during COVID-19 infection		0.494		0.104
Home isolation (<i>n</i> = 161)	80 (32.9)		1 [reference]	
Non-home isolation (<i>n</i> = 243)			1.63 (0.90-2.97)	

* Includes businesspeople, military, and police. n, frequency; %, percentage; AOR: Adjusted Odds Ratio, CI, Confidence Interval.

main reasons for not disclosing the disease were the fear of stigma and discrimination or to protect the family from facing discrimination.⁴⁶

By conducting univariable analysis, multiple characteristics showed associations with the COVID-19 perceived stigma level in our study. Male gender was associated with higher levels of perceived stigma ($p = 0.002$), which was not the case in two studies, one from Lebanon and one from China,^{36,42} that showed no significant association between gender and COVID-19 stigma. The results of focus group discussions conducted in Turkey showed that both genders were at risk of high perceived Covid-19 stigma due to their responsibilities.⁴⁷ However, gender failed to predict COVID-19 perceived stigma in our logistic regression. We suggest that the association between gender and Covid-19 perceived stigma was not true and confounded by other variables such as occupation and education level as most manual workers are males in Qatar.

Participants living alone showed a higher level of Covid-19 perceived stigma in univariable analysis. A potential cause may be the lack of social support in this group. However, this variable did not predict COVID-19 perceived stigma independently in the logistic regression, which could be explained by the fact that most manual workers in Qatar are single male workers living in accommodations provided by their employers. Usually, workers in these accommodation units live with their co-workers. Even though this is not considered a living-alone condition, the social support provided by co-workers may still be limited.

Our results also showed an association between being isolated in a non-home setting (hospital or isolation facility)

during the disease course and an increased level of perceived COVID-19 stigma, with a p -value < 0.001. This finding aligns with the results of two qualitative studies, which found that COVID-19 patients being isolated far from their homes may have higher COVID-19 perceived stigma.^{47,48} Nevertheless, the isolation setting could not predict COVID-19 perceived stigma in our logistic regression model.

We found that non-Arabs reported more than five times higher stigma levels than Arabs (AOR = 5.37, 95%CI: 2.79–10.32). Thus, ethnicity could predict higher levels of COVID-19 perceived stigma. This finding is consistent with the results of previous studies. For instance, a study conducted in Canada among 3273 residents in Quebec found a statistical association between ethnicity and the higher level of COVID-19 perceived stigma ($p < 0.001$).⁴⁹ Another study from the United States showed a significant association between ethnicity and COVID-19-related stigma.⁵⁰ Notably, the highest proportion of the non-Arab population in Qatar, as well as in our study, were Filipinos ($n = 59$, 14.6%) and Indians ($n = 54$, 13.4%) of Asian origin. According to the CDC, the Asian population might be more prone to experience higher COVID-19-related stigma than other racial and ethnic groups.¹⁸

The occupation type was a predictor of a higher level of COVID-19 perceived stigma in our study. Manual workers had an adjusted odds ratio of 2.58 (95%CI: 1.46–4.56) for having higher stigma levels compared with those practicing professional occupations. The majority of manual workers in Qatar are migrant workers. Migrant workers account for over 2 million comprising approximately 95% of the total labor workforce in Qatar.⁵¹ The literature suggests that migrant

workers and workers practicing specific jobs such as grocery store clerks and delivery drivers are at an increased risk of experiencing COVID-19-related stigma, and they could be accused of bringing the disease to the community.^{18,52,53}

We found low levels of education to be statistically associated with higher COVID-19 perceived stigma. A possible explanation may be that more educated individuals better understand the illness, and thus may be less prone to experience COVID-19 perceived stigma. The literature suggests that education is a protective factor against stigma and especially the perceived stigma. The Dar et al. study⁵⁴ had similar results to ours in terms of the association between education level and COVID-19 perceived stigma; however, in the same study, a higher level of education was associated with an increased enacted stigma level among COVID-19 survivors. Another study on Nigerian women found a similar association between educational levels and stigma.⁵⁵

This research is the first study to assess COVID-19 perceived stigma in Qatar. The sample frame included all the cases diagnosed in Qatar since the pandemic started to prevent selection bias. Furthermore, diagnostic criteria based on the CDC guidelines were utilized to eliminate misclassification bias. Additionally, the sample size was large, and a probability sampling technique was employed to preserve the external validity and generalizability of the results. The response rate of the survey was acceptable (84.4%).⁵⁶

To overcome measurement bias, we ensured testing of the tools through face validation. Then, we examined the theoretical importance of the questionnaire through content validation. The representativeness and appropriateness of language used were tested by translation validation. In the end, reliability was computed, and it revealed excellent internal consistency across the scale.

It is particularly important to conduct studies of this type in Qatar, given the diversity of this country with a multi-cultural society. The population in Qatar comes from different backgrounds, portrayed by having participants from 41 different nationalities in our study. This supports our study's external validity and makes our results more generalizable.

The study does come with a few limitations. First, the design used is cross-sectional, which lacks the temporal relationship and compromises causality. Second, for feasibility issues, only those who spoke Arabic or English were studied. Other large populations residing in Qatar, such as strict Hindi, Urdu, or Filipino speakers, were not included. Third, by the time we developed the data collection tools, there were limited resources regarding perceived stigma among survivors. Finally, another potential limitation may be that the CPSS-22 was not validated in a separate study. A future study may explore its validity and its use to assess stigma related to any infectious diseases and in other contexts.

Conclusion

More than a quarter of COVID-19 survivors in Qatar have moderate to high perceived stigma. We found a significant association between perceived stigma and patients' ethnicity, educational status, and type of occupation. These associations will help implement preventive programs that target stigma early in the disease trajectory. Particular

importance should be given to reduce perceived stigma among migrant manual workers. Furthermore, we recommend testing the reliability and validity of the CPSS-22 in different settings and cultural contexts, particularly its convergent validity against other scales measuring different psychological impacts of COVID-19 such as depression and anxiety scales.

Ethical considerations

The study protocol was approved by the institutional review board of Hamad Medical Corporation under protocol ID (MRC-01-21-188). Informed consent was acquired from all participants. The study was conducted in full conformance with principles of the "Declaration of Helsinki" and Good Clinical Practice

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