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RESEARCH ARTICLE

REVISED Predictors of social response to COVID-19 among health care workers caring for individuals with confirmed COVID-19 in Jordan [version 2; peer review: 2 approved]

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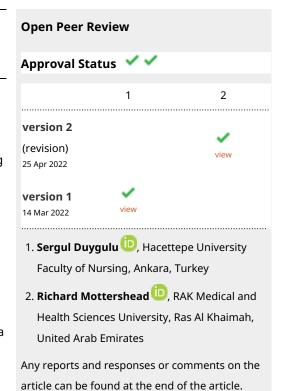5School of Nursing, The University of Jordan, Amman, Jordan

Abstract

Background: The outbreak of COVID-19 forced public health authorities around the world to call for national emergency plans. Public responses, in the form of social discrimination and stigmatizing behaviors, are increasingly being observed against individuals with confirmed COVID-19 and healthcare workers (HCWs) caring for those individuals. Therefore, this study aimed to investigate the perception of social discrimination and coping strategies, and explore predictors of social discrimination and coping with COVID-19 among HCWs and individuals with confirmed COVID-19.

Methods: This study used a cross-sectional descriptive-comparative design to collect data, using a convenience sample of 105 individuals with confirmed COVID-19 and 109 HCWs using a web-based survey format.

Results: In this study, individuals confirmed with COVID-19 reported a high level of social discrimination compared with HCWs (t = 2.62, $p <$ 0.01), while HCWs reported a high level of coping with COVID-19 compared to individuals with COVID-19 (t = -3.91, $p <$ 0.001). Educational level, age, monthly income, and taking over-the-counter medication were predictors of social discrimination and coping with COVID-19 among HCWs and individuals with confirmed COVID-19.

Conclusions: The findings showed that individuals with confirmed COVID-19 were more likely to face social discrimination, and HCWs cope with COVID-19 better than ordinary individuals with confirmed COVID-19.

Keywords

Social Response, COVID-19, Health Care Workers, Coping, Jordan.

Open Peer Review

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> **REVISED** **Amendments from Version 1**
>
> In this version, new information is added in response to the Reviewer's feedback and comments. Information was added for more clarifications and understanding. Research questions were added after the study objectives. Detailed information about the data collection procedure was also enclosed.
>
> **Any further responses from the reviewers can be found at the end of the article**

Introduction

Over the past two years, the COVID-19 pandemic has been threatening human lives around the world, and health-care professionals are among those who are at higher risk due to immediate exposure to infection and infected people (Gan *et al.*, 2020). Waves of COVID-19 outbreak are continuingly taking different forms and series adding further long-term burden on healthcare professionals. A recent study showed that the general population, due to COVID-19, were suffering stress, anxiety, depression, and psychological disturbances (Hamaideh *et al.*, 2021). Nevertheless, health-care workers (HCWs) have demonstrated exceptional courage and commitment despite their fears of being at higher risk of infection and assumed to infect others (Liu *et al.*, 2020). Approximately 14% of WHO-reported COVID-19 cases are HCWs (Organization, 2020a). In addition, HCWs are also considered a source of virus transmission according to public perception (Dalky *et al.*, 2020).

The increasing reports of spread of COVID-19 has provoked fear and concern among people globally (Tang *et al.*, 2020). Important concerns include a stigma associated with COVID-19 and the issues related to unknown pathophysiology, treatment, and effectiveness of vaccination (Dalky *et al.*, 2020; Organization, 2020b). This situation has created a new form of stigma and discrimination against individuals with COVID-19 (Tang *et al.*, 2020). There has been a harsh attitude toward those who have been infected and HCWs caring for individuals confirmed with COVID-19 (Bhanot *et al.*, 2020). The stigmatizing behaviors demonstrated the dread of the unknown and the unexplained negative attitudes toward infected people or suspected of being infected, as well as, those suspected of spreading the virus such as HCWs (Bhanot *et al.*, 2020). Societies have blamed people infected with COVID-19 for being ignorant and indifferent (Morin, 2021). This had indicated the need for more emphasis on research to understand the public responses and forms of understanding such dilemmas.

The pandemic has put an extraordinary psychological burden on HCWs due to work in high-demanding environments forcing them to isolate themselves for fear of transmitting the infection and further accusations of spreading the infection (Rodríguez and Sánchez, 2020). In addition, it has been noticed that the use of social media to negatively reporting and addressing the COVID-19 pandemic has led to social discrimination against those confirmed with COVID-19 and HCWs, as well (Singh and Subedi, 2020). Regrettably, HCWs are labeled, faced loss of status and discrimination due to the stigma associated with COVID-19 (Singh and Subedi, 2020). Public responses in the form of social discrimination and stigmatizing behaviors are increasingly being observed against individuals with confirmed COVID-19 and HCWs caring for individuals with COVID-19 (Abuhammad *et al.*, 2021; Bhanot *et al.*, 2020). Discriminatory behaviors are observed in the form of denial of infection, concealment of being infected, or refusal of the COVID-19 test. Thus, the need to emphasize such an issue would enable understanding reasons and contributing factors related to burnout and psychological distress among HCWs.

The ongoing transmission, the increasing number of COVID-19 cases, and the growing need to study the effects of community response, discrimination, and stigmatization against HCWs and individuals with confirmed COVID-19 infections are important areas that needs further exploration (Dalky *et al.*, 2020). This makes addressing social discrimination practiced against individuals with COVID-19 and HCWs a significant issue (Dalky *et al.*, 2020). Because of their long and intense exposure to various stressors, it is important to address and understand coping strategies used by HCWs and individuals with COVID-19 to manage stigma practiced against them. This will provide information guidance on what interventions could be implemented to maintain the best care for individuals infected with COVID-19 and maintaining the mental wellness of HCWs, as well. Although studies are increasingly published in the context of psychological consequences of COVID-19 worldwide, there is still a need to address public responses and how it is affecting HCWs' coping abilities; in particular, in the Arab culture. This study investigated the perception of social discrimination and coping strategies, and predictors of social discrimination and coping toward COVID-19 among HCWs and individuals with COVID-19.

The aims of this study were:

- To compare coping and social discrimination to COVID-19 among HCWs and individuals with COVID-19.

- To assess sociodemographic or personal factors that could predict coping and social discrimination toward COVID-19 among HCWs and individuals with COVID-19.

Research Questions:

- What is the level of social discrimination against COVID-19 among HCWs and individuals with COVID-19?

- What is the level of coping with COVID-19 among HCWs and individuals with COVID-19?

- Which are the study factors that could predict coping and social discrimination toward COVID-19 among HCWs and individuals with COVID-19?

Methods
Design
This study utilized a cross-sectional design using a descriptive-comparative approach of research. Data collected in relation to social discrimination and coping from individuals infected with COVID-19 and their health-care workers caring form them was collected using a self-reported online survey format. In this study, data was collected via an online survey. Participants were contacted online via social media available for HCWs and individuals with COVID-19. Upon agreeing to participate in the study, signed the consent participants were encouraged to complete the online survey. Authors' information was available shall they have questions or queries and assistance was available accordingly.

Sample and setting
The sample included individuals who had been infected with COVID-19 and HCWs caring of individuals with COVID-19. A convenience sampling technique was used to recruit the participants of this study. A minimum number of 100 per each group was determined as necessary to achieve the study desired power of 80 % at the level of significance of α = 0.05. Inclusion criteria for HCWs were: 1) providing direct care to those infected with COVID-19. HCW were excluded if he/she reported being infected. For public, to be eligible, required 1) being aged 18 years or above, 2) have access to software to fill out the survey, and 3) be able to read and write in Arabic. Those with physical, mental or cognitive disabilities were excluded as it may interfere with their ability to understand the questions and make their responses.

Instruments
The Arabic versions of the tools were used in this study. WHO guidelines for translation and adaption were used to translate the survey. The tools used were as follows:

Social discrimination was measured using the Social Discrimination Scale (Dinos *et al.*, 2004). The Arabic version of the social discrimination subscale was developed and used before by Dalky et al. (2020) and thus used in this study. This subscale is composed of 12 items and individuals are requested to choose their response on a Likert scale formed of five possible responses ranging from 1 (strongly disagree) to 5 (strongly agree). Those who had a higher score on the scale were more likely to experience a higher level of social discrimination. Previous studies showed good internal consistency with Cronbach's alpha of 0.80 (Dalky *et al.*, 2020).

Lifestyle management and psychosocial adaptation with COVID-19 were measured using the FANTASTIC survey (Wilson *et al.*, 1984). This scale focuses on physical and health-related fitness of individuals. The scale is formed of 17 items measuring nine domains with each domain name represented by the first letter of the word "FANTASTIC": F for Family and Friends, A for Activity, N for Nutrition, T for Tobacco and Toxics, A for Alcohol Intake, S for Sleep, Seatbelts, Stress, and Safe sex, T for Type of behavior, I for Insight, and C for Career. The scale investigates individuals' perception during the previous month. The total score indicates the category in which the individual falls, ranging from needing improvement (0-35) to excellent (85-100). The scale has good reliability with Cronbach's alpha of $r = 0.88$.

Sociodemographic variables

An author-developed profile was developed to collect information in relation to age, gender, marital status, and other sociodemographic information from both patients and HCWs. Specific information was collected from HCWs regarding their work placement and experiences.

Data analysis
The software package IBM-SPSS v.25 was used to analyze the collected data. Central tendency measures and dispersion measures were used to describe the variables of the study. Pearson's r coefficient was used to assess correlation magnitude and direction. A t-test for two independent samples and ANOVA were used to test differences and compare the HCWs' and individuals with COVID-19 responses, respectively. A multiple logistic regression test was used to examine predictors of social discrimination. The alpha significance level was set to 0.05.

The study was granted ethical approval (reference number 113/132/2020), as suggested by both academic authors' institutions and hospitals administration systems relevantly. The authors received written informed consent from HCWs and individuals with confirmed COVID-19 participants. The consent form included detailed information about the study aims, and the need to conduct such studies, as well as their approval for the publication of this manuscript for research purposes to increase knowledge in this area of COVID-19 impact.

Results

Demographic variables

In this study, the total number of individuals with confirmed COVID-19 who completed the survey was 105. Their age ranged from 18-60 years with a mean (M) of 34 (SD=10.4) years (see Table 1). The total number of HCWs who participated was 109. The age of HCWs ranged from 23-65 years with a mean of 33.7 (SD = 7.6) years (see Table 2).

Differences between HCWs and individuals with confirmed COVID-19 in relation to social discrimination associated with COVID-19

The results of the t-test showed that there was a significant difference between mean score of HCWs and individuals with confirmed COVID-19 in relation to social discrimination (t = 2.62, p < 0.01) (see Table 3). The total mean item score of individuals with confirmed COVID-19 was higher (M = 2.64, SD = 0.867) than the total mean item score of HCWs (M = 2.07, SD = 0.19). The item-to-item comparison showed that individuals with confirmed COVID-19 mean item scores were significantly higher than HCWs in all items. The highest mean scores for individuals with confirmed COVID-19 were observed for the items "People insulted me for being diagnosed with the Coronavirus" and "I have not had any problems due to Coronavirus diagnosis" (M = 3.87, SD = 0.856; M = 3.66, SD = 1.192; respectively). The lowest mean items for individuals with confirmed COVID-19 were observed for "I was discriminated against because of my diagnosis of the Coronavirus" and "After I suffered due to a diagnosis of Coronavirus, I feel that life is unfair" (M = 1.99, SD = .098; M = 2.74, SD = 1.010; respectively).

Table 1. Descriptive statistics of Individuals with confirmed COVID-19 (N=105). JD = Jordan Dinar.

	n	%
Gender		
Female	49	46
Male	56	54
Education level		
High school	15	14.3
Diploma	16	15.2
Bachelor	61	58.1
Graduate studies	13	12.4
Marital status		
Single	32	30.5
Married	65	61.9
Divorced	4	3.8
Widowed	4	3.8
Monthly income		
Less than 200 JD	21	20.0
From 201 to 500	53	50.5
From 501 to 800	26	24.8
From 801 to 1200	5	4.8
More than 1201	21	20.0
Quarantine		
Not quarantined-not infected	69	65.7
Quarantined-not infected	36	34.3
Quarantined for screening	6	2.2

Table 2. Health-care workers descriptive statistics (N=109).

	n	**%**
Gender		
Male	46	42.2
Female	63	57.8
Marital status		
Single	27	24.8
Married	77	70.6
Divorced	5	4.6
Working area		
Governmental hospital	44	40.4
Military hospital	19	17.4
Private sector	25	22.9
University-affiliated	18	16.5
Education level		
Diploma	13	11.9
Bachelor	76	69.7
Graduate	20	18.3
Specialty		
Nurse	91	83.5
Physician	7	6.4
Radiology technician	2	1.8
Midwife	4	3.7
Pharmacist	2	1.8
Administrator	3	2.8

Differences between HCWs and individuals with COVID-19 in relation to coping strategies

The results of the t-test showed that there was a significant difference between HCWs and individuals with confirmed COVID-19 in coping with COVID-19 ($t = -3.91$, $p < .001$) (see Table 4). The total mean item score of HCWs was higher (M= 51.8, SD = 0.86) than the total mean coping item score of individuals with confirmed COVID-19 (M = 34.3, SD = 1.19). The item-to-item comparison showed that, in general, individuals with COVID-19 had significantly lower mean item scores than HCWs for all items. The highest mean items for HCWs were observed for "I am satisfied with my job or role" and "I give and receive affection" (M = 4.28, SD = 0.859; M = 4.14, SD = 0.976), respectively. The lowest mean item scores for HCWs were observed for "I am vigorously active for at least 30 minutes per day e.g., running, cycling, etc." and "I eat a balanced diet (see explanation)" (M = 1.56, SD = 1.013; M = 2.44, SD = 1.287), respectively.

Predictors of coping with COVID-19 among HCWs and individuals with confirmed COVID-19

Regarding predictors of coping with COVID-19 in relation to demographic variables of the whole group, a multiple regression test was conducted. The results showed that the model was significant ($F = 14.88$, $p = 0.001$). Educational level was a significant predictor (B = 0.541, $p < 0.001$) indicating that those with higher educational levels had higher scores in coping with COVID-19. Age was also a significant predictor (B = 0.187, $p = 0.007$) indicating that older people have higher coping score. The third significant predictor was monthly income (B= -0.338, $p < 0.001$) that has negative association imposing income as risk factor. In addition, taking over-counter medication was a significant predictor (B = 0.54, $p < 0.001$) indicating that those who use over-counter medication are more likely to have higher coping scores (see Table 5).

Predictors of discrimination perception associated with COVID-19 among HCWs and individuals with confirmed COVID-19

To investigate discrimination perception associated with COVID-19 among both groups, a multiple regression test was conducted. The results showed that the model was significant ($F = 14.21$, $p = .001$). The predictors were educational level (B = -0.447, $p < 0.001$) which indicated that as the level of education increased, individuals experienced less

Table 3. Differences between health-care workers (HCWs) (N=109) and individuals with confirmed COVID-19 (N = 105) in perception of social discrimination for people with COVID-19.

Items	HCW		Individuals with COVID-19		t-test	*p*-value
	M	SD	M	SD		
1. I was discriminated against because of my diagnosis of the Corona virus	1.96	1.20	1.99	.098	2.62	< .01
2. Sometimes I feel uncomfortable talking to them because of my diagnosis of the Coronavirus	2.30	1.18	3.51	1.084		
3. I was discriminated against by the police because of my diagnosis of Corona virus	1.99	1.14	3.34	1.167		
4. I was discriminated against by my employer because of my diagnosis of Coronavirus	1.93	1.05	2.99	1.213		
5. I often feel lonely because of my diagnosis of Corona virus	2.14	1.19	3.22	1.208		
6. People's reactions to being diagnosed with the Coronavirus make me keep myself isolated	2.37	1.13	3.34	.979		
7. I am angry at the way people interacted with me for being diagnosed with the Coronavirus	2.11	1.09	3.24	1.079		
8. I have not had any problems due to Corona virus diagnosis	2.17	1.18	3.66	1.192		
9. I have been discriminated against by health professionals due to my diagnosis of Coronavirus	1.86	1.05	3.07	1.040		
10. People have avoided me because I am diagnosed with the Coronavirus	2.26	1.13	3.16	1.234		
11. People insulted me for being diagnosed with the Coronavirus	1.75	.87	3.87	.856		
12. After I suffered due to a diagnosis of Coronavirus, I feel that life is unfair	1.97	1.13	2.74	1.010		
Social discrimination total	2.07	.19	2.64	.867		

discrimination associated with COVID-19; age (B = -0.162, *p* = 0.02): as age increased the discrimination against COVID-19 was decreased; and monthly income (B = 452, *p* < 0.001), which means with a higher income experienced more discrimination associated with COVID-19. The other predictor was taking medication over the counter (B = 0.447, *p* < 0.001) which means people taking medication over the counter experienced more discrimination associated with COVID-19 (see Table 6).

Discussion

Responses to COVID-19 might influence the process of treatment and willingness to collaborate. Therefore, differences in perception of social responses in the form of social discrimination between HCWs and individuals with confirmed COVID-19 is a core component in coping with the disease. The results of this study showed that individuals with confirmed COVID-19 had a higher perception of social discrimination and a lower level of coping with COVID-19 compared to HCWs. The results indicate that the general and ordinary individuals are more likely to be exposed to discrimination and possess a lower level of ability to cope with the disease and related factors than the HCWs. Moreover, it is possible that HCWs might have a higher level of knowledge and competency to manage discrimination phrases or cues or have lower sensitivity for such expressions that contributed to their feelings of being discriminated against. It is expected due to their education and training that HCWs are more capable of coping with the disease and manage discrimination than the general population (Chew *et al.*, 2020). Such major differences in perception of being discriminated against may cause conflicts in understanding, communicating, or commitment to a treatment plan that interferes with the achievement of health-care outcomes. The results do support previous reports in which social discrimination and fear of communicable diseases hampered the response of the public (Brooks *et al.*, 2020; Liebrenz *et al.*, 2020). It has also been noted that social discrimination has forced people to negate their positive results of infection to avoid discrimination leading them to avoid seeking healthcare services and lacking protective health measures that endangered others' health conditions and lives (Brooks *et al.*, 2020; Liebrenz *et al.*, 2020).

Table 4. Differences between health-care workers (HCWs) and indivduals with confirmed COVID-19 in relation to coping with COVID-19, (N= 214).

Items	Infected people		HCW		t-test	p-value
	M	SD	M	SD		
1. I have someone to talk to about things that are important to me	3.69	1.022	4.10	1.071		
2. I give and receive affection	3.78	.940	4.14	.976		
3. I am vigorously active for at least 30 minutes per day e.g., running, cycling, etc	1.65	1.015	1.56	1.013		
4. I am moderately active (gardening, climbing stairs, walking, housework)	2.01	1.312	2.80	1.556	t = -3.91	p < .001
5. I eat a balanced diet (see explanation)	2.06	1.110	2.44	1.287		
6. I often eat excess 1) sugar, or 2) salt, or 3) animal fats, or 4) junk food	2.33	1.141	2.64	1.183		
7. I sleep well and feel rested	3.33	.927	3.27	1.168		
8. I use seatbelts	3.34	1.377	3.01	1.309		
9. I can cope with the stresses in my life	3.48	.856	3.89	.906		
10. I relax and enjoy leisure time	3.12	.927	3.17	1.096		
11. I practice safe sex (see explanation)	2.91	1.201	3.21	1.667		
12. I seem to be in a hurry	2.93	.858	2.75	1.073		
13. I feel angry or hostile (Reversed)	3.18	.838	3.28	.983		
14. I am a positive or optimistic thinker	3.39	.766	3.84	.973		
15. I feel tense or uptight (Reversed)	2.96	.950	2.94	.993		
16. I feel sad or depressed (Reversed)	3.05	.974	3.11	1.117		
17. I am satisfied with my job or role	3.51	.942	4.28	.859		

Table 5. Predictors of coping among health-care workers (HCWs) and individuals with confirmed COVID-19 (n= 214).

Model		Unstandardized coefficients		Standardized coefficients	t	Sig.
		B	standard error	Beta		
1	(Constant)	29.351	10.951		2.680	.008*
	Age	.179	.066	.187	2.712	.007
	Gender	.862	1.353	.039	.637	.525
	Marital status	.098	1.270	.005	.077	.939
	Monthly income	-4.109	.677	-.338	-6.070	.000**
	Medication over counter	4.865	.506	.541	9.614	.000**

Dependent variable: SUMCOPING.
*p < 0.01.
**p < 0.001.

While COVID-19, due to its pandemic nature and global influence pattern, is considered a stress-inducing illness, coping strategies are still required to manage the disease and its consequences (Hamaideh et al., 2021). In this study, HCWs used coping strategies more effectively than individuals with COVID-19. In previous reports, HCWs were challenged in managing their responsibilities due to stigma and discrimination (Dalky *et al.*, 2020). Nevertheless, they were able to better use the coping strategies than ordinary people. It is worth saying that social isolation and job burden are factors that have contributed to increased job stress among HCWs (Bani-Hani and Hamdan-Mansour, 2021; Singh and Subedi, 2020). Thus, HCWs might have depended largely on their learned adaptation skills to manage job stress to be able to handle discrimination and cope better COVID-19. On the other hand, ordinary people probably lack the skills and

Table 6. Predictors of discrimination against COVID-19 among health-care workers (HCWs) and individuals with confirmed COVID-19 (N= 214).

Model		Unstandardized coefficients		Standardized coefficients	t	Significant level
		B	Std. Error	Beta		
1	(Constant)	44.555	11.656		3.823	.000**
	Age	-.164	.070	-.162	-2.334	.021
	Gender	-1.115	1.440	-.048	-.774	.440
	Marital status	1.737	1.351	.090	1.285	.200
	Monthly income	5.792	.721	.452	8.039	.000**
	Medication over counter	4.237	.539	.447	7.866	.000**

Dependent variable: SUMD.
**$p < 0.001$.

knowledge to manage discrimination due to fear of losing their social and occupational privileges (Chew *et al.*, 2020). There were differences in using coping strategies between HCWs and individuals with confirmed COVID-19. Such difference might negatively affect HCWs, due to the fact that they are more vulnerable to COVID-19 infection compared to the general population. It has been confirmed that such differences might influence and explain the level of care provided by the HCWs and the low level of compliance and collaboration of individuals with confirmed COVID-19 (Kar *et al.*, 2021). The degree to which a person fears COVID-19 is an element that could be important in understanding the coping process. Fear is an emotional state that stimulates self-defense behaviors; thus, fear of infection would influence coping strategies leading to poor prognosis (Kim *et al.*, 2020).

Besides, many factors could be related to social discrimination against individuals with confirmed COVID-19 or HCWs caring for those people. Such factors might be related to the collectivist culture that puts high social pressure on people and affects their decisions to seek healthcare services (Al Ali *et al.*, 2017; Aldalaykeh *et al.*, 2019). For instance, fear and anxiety from the spread of COVID-19 may lead to social discrimination in people having disease, places that are considered sources of the infection such as hospitals, and even people who were in quarantine (CDC, 2020). Furthermore, social discrimination and stigmatized behaviors are extensively noted in mental health research; however, these variables in the context of COVID-19 seem to lead to the same negative effect on health-care outcomes (Brooks *et al.*, 2020). The notion that social discrimination is a multifaceted factor infers that a reciprocal relationship exists between the bio-psycho-social and cultural components of human wellbeing (Dalky *et al.*, 2020). In other words, the social discrimination might take various forms depending on the cultural definition of discrimination. People with COVID-19 who complied with the quarantine have reported higher levels of psychological disturbances such as stress and anger (Brooks *et al.*, 2020). Such a critical health situation in addition to poor coping and discrimination, might be a threat to successful endorsement and implementation of public healthcare plans against COVID-19 leading to poor healthcare outcomes (Fu *et al.*, 2021).

Furthermore, the study found that HCWs and individuals with confirmed COVID-19 who have a high level of education and use over-the-counter medication showed greater coping with COVID-19. The results support previous equivalent studies that indicated using emotional-based coping among low educated people compared to using problem-based coping among those with a high level of education (Mohammadzadeh *et al.*, 2020; Shamsi *et al.*, 2021). This reflects the differences in the behavioral responses related to individual knowledge and experience. In addition, the results showed that HCWs who earned a high income showed greater coping with COVID-19. These findings are in line with previous studies that found financial constraints were linked to and predicted higher levels of stress and lower levels of effective coping (Atchison *et al.*, 2020; Barbara *et al.*, 2020; Cluver *et al.*, 2020). Similarly, age and literacy play a positive role in predicting effective coping and positive responses (Darraj *et al.*, 2016; Magsamen-Conrad *et al.*, 2019; Moukaddam and Shah, 2020; Volk *et al.*, 2021), older people and more literate ones were found to use more effective coping strategies with COVID-19 than younger and illiterate people. Such findings were consistent with previous studies that reported a higher level of coping connected to higher levels of resiliency (Pearman *et al.*, 2020).

Limitations
There were two limitations of our study. First, data was collected using cross sectional sampling utilizing an online survey format which limits ability to derive causal relationships. Secondly, using a self-reporting format might not allowed to draw objective data affected by recall bias.

Conclusions

This study focused on exploring predictors of coping and responses to social discrimination in the form of stigma among HCWs and individuals with confirmed COVID-19. The findings showed that individuals with COVID-19 were more likely to face social discrimination than HCWs. Yet, in dealing with COVID-19, HCWs used more effective coping strategies with COVID-19 than non-medical infected individuals. The main conclusion of this study is that predictors of social discrimination and coping were educational level, age, monthly income, and taking over-the-counter medication. Although both social discrimination and coping are complicated and may be influenced by a variety of factors, we must reconsider and find ways to reinforce them in light of the probable recurrence of COVID-19 and other future global pandemic risks. Innovative strategies are to be granted to clinical practice and the public sectors to best tackle the challenges associated with the COVID-19 pandemic. In addition, public media also has to be targeted to combat discrimination and support individuals confirmed with COVID-19 and HCWs caring for them.

Relevance for clinical practice

This study has implications relevant to clinical practice, as well as policymakers and public health officers. The results emphasize the need to enhance mutual understanding of the effect of discrimination on both ordinary people and HCWs. Training and enhancement of psychological skills is needed for both ordinary people and HCWs and has to be included in treatment protocols. Furthermore, HCWs are in need of peer and organization support to enable them to manage job burden and discrimination. Management and administrative personnel can guide and support the HCWs by reforming or modifying the current clinical practice to best accommodate and cope with extra or unexpected demands added to the HCWs shoulders, as those seen during the COVID-19 pandemic.

Data availability
Underlying data
Zenodo: Data repository of Predictors of Social Response to COVID-19 among Health Care Workers Caring for Individuals with Confirmed COVID-19 in Jordan, https://doi.org/10.5281/zenodo.6044084 (Dalky *et al.*, 2022).

This project contains the following underlying data:

- Project1 (2) (1).xlsx (raw survey data)

Extended data
Zenodo: Data repository of Predictors of Social Response to COVID-19 among Health Care Workers Caring for Individuals with Confirmed COVID-19 in Jordan, https://doi.org/10.5281/zenodo.6044084 (Dalky *et al.*, 2022)

This project contains the following extended data:

- COVID-19 in Jordan.docx

Data are available under the terms of the Creative Commons Attribution 4.0 International license (CC-BY 4.0).

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Open Peer Review

Current Peer Review Status: ✓ ✓

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Version 2

Reviewer Report 14 March 2023

https://doi.org/10.5256/f1000research.133419.r161583

✓ **Richard Mottershead** (iD)

Ras Al Khaimah College of Nursing, RAK Medical and Health Sciences University, Ras Al Khaimah, United Arab Emirates

Thank you for allowing me the opportunity to review this research article paper which I have found both insightful and informative. I have read the article with interest and have the following comments to deliver:

I believe that this is a well-composed article, which will be of interest to all healthcare practitioners and the general populations as we attempt to gain an understanding on the impact and fallout of covid-19. The authors are embedded within clinical practice and education and seek to make long-standing contribution to this crucially important field of research that is both contemporary and adds new knowledge to the evidence based literature. This of course will aid and inform clinical practice if assimilated by health and social care professionals and policy decision makers. The paper provides insight into the lived experience of HCW's and social discrimination within Jordan and allows for comparative overview with studies conducted outside the MENA region. The paper supports a collective consciousness on the impact of the pandemic on our health and social care workers and allows for consideration to be given for how they can be supported in future pandemics.

The authors identify the limitations of the study and it is feasible that future studies make seek a narrative/life story approach to gain further mean-making insight into the HCW's lives. The research could assist with resilience and coping strategies to improve service delivery by combating stigmatisation.

I hope that the paper allows the authors to continue their research journey and I wish the authors well.

Is the work clearly and accurately presented and does it cite the current literature?
Yes

Is the study design appropriate and is the work technically sound?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?
Yes

If applicable, is the statistical analysis and its interpretation appropriate?
Yes

Are all the source data underlying the results available to ensure full reproducibility?
No source data required

Are the conclusions drawn adequately supported by the results?
Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: I am a qualified researcher, health practitioner with experience of supporting health and social care practitioners during covid 19 and published within this research topic.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

- -

Version 1

Reviewer Report 12 April 2022

https://doi.org/10.5256/f1000research.79654.r127956

✔

Sergul Duygulu (iD)
Department of Nursing Management, Hacettepe University Faculty of Nursing, Ankara, Turkey

Thank you very much for giving me the opportunity to review this manuscript. The subject covered in the study is a current and important issue. In particular, the research has addressed an important issue in terms of addressing the problems experienced by healthcare professionals and individuals diagnosed with COVID-19 at the beginning of the pandemic.

This study aimed to explore perceptions of social discrimination and coping strategies, and to explore predictors of social discrimination and coping with COVID-19 among healthcare workers and individuals with confirmed COVID-19. The theoretical basis of the study is well explained and it is clearly stated that the results of the study will meet which need in the literature. However, it can be put forward more clearly why the determinants of social discrimination and coping with COVID-

19, which are discussed in this study, should be determined. Another suggestion is that in this study, there is a need to include the answers to the questions of why individuals and healthcare professionals with a history of being diagnosed with COVID-19 and healthcare professionals at the same time and why a comparative study is needed, albeit briefly, in the introduction.
The aim of the study is stated. However, it would be appropriate to include research questions/hypotheses.

The design of the study is appropriate. Sampling inclusion and exclusion criteria are specified. There is no statement that the adequacy of the sample size is evaluated. It would be appropriate to write. The study's sample "individuals with confirmed with COVID 19 and healthcare workers" is considered to be the limitation of this study. However, this limitation is acceptable as the results of the study address an important issue. However, as a limitation, it would be appropriate to refer to the sample size in the limitation session of manuscript.

Although it has been stated that data collection is carried out online, the data collection procedure can be explained in more detail. How did the process work?

The findings, discussion and conclusion of the study were reported in accordance with the aims of the study.

Is the work clearly and accurately presented and does it cite the current literature?
Yes

Is the study design appropriate and is the work technically sound?
Yes

Are sufficient details of methods and analysis provided to allow replication by others?
Partly

If applicable, is the statistical analysis and its interpretation appropriate?
Yes

Are all the source data underlying the results available to ensure full reproducibility?
No source data required

Are the conclusions drawn adequately supported by the results?
Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Nursing management, community health nursing

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Author Response 21 Apr 2022

Heyam Dalky

Thank you very much for giving me the opportunity to review this manuscript. The subject covered in the study is a current and important issue. In particular, the research has addressed an important issue in terms of addressing the problems experienced by healthcare professionals and individuals diagnosed with COVID-19 at the beginning of the pandemic.

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Response: Social discrimination has been reported widely in the literature during the pandemic and people reacted differently to the diagnosis. We thought HCP also might have this and decided to study it and also the predictors to better plan for future occurrences of the unexpected pandemics.

Another suggestion is that in this study, there is a need to include the answers to the questions of why individuals and healthcare professionals with a history of being diagnosed with COVID-19 and healthcare professionals at the same time and why a comparative study is needed, albeit briefly, in the introduction.

Response: It is known in the literature that experience or perception of social discrimination and stigma are personal in nature and varies among individuals or groups. This perception could lead to various negative consequences that require further investigations to study and plan the suitable interventions to tackle and treat them. Yet, a comparative study or approach usually presents differences among both groups to highlight the interventions needed accordingly.

The aim of the study is stated. However, it would be appropriate to include research questions/hypotheses.

Response: This comment is fully considered. The requested information is added in red-colored text after the study aims in the introduction section.

Research Questions:
- What is the level of social discrimination against COVID-19 among HCWs and individuals with COVID-19?

- What is the level of coping with COVID-19 among HCWs and individuals with COVID-19?

- Which are the study factors that could predict coping and social discrimination

toward COVID-19 among HCWs and individuals with COVID-19?
The design of the study is appropriate. The sampling inclusion and exclusion criteria are specified. There is no statement that the adequacy of the sample size is evaluated. It would be appropriate to write.

Response: This information is added as suggested. See red-colored text in the methods section; sample.

A minimum number of 100 per each group was determined as necessary to achieve the study's desired power of 80 % at the level of significance of α =0.05.

The study's sample of "individuals with confirmed with COVID 19 and healthcare workers" is considered to be the limitation of this study. However, this limitation is acceptable as the results of the study address an important issue. However, as a limitation, it would be appropriate to refer to the sample size in the limitation session of manuscript.

Response: These comments are fully considered. The sample size in this study was convenient and appropriate to drown the conclusions derived.

Although it has been stated that data collection is carried out online, the data collection procedure can be explained in more detail. How did the process work?

Response: These comments are fully considered, the information is added for more clarifications. See methods added red-text.

In this study, data was collected via an online survey. Participants were contacted online via social media available for HCWs and individuals with COVID-19. Upon agreeing to participate in the study, signed the consent participants were encouraged to complete the online survey. Authors' information was available shall they have questions or queries and assistance was available accordingly.

The findings, discussion and conclusion of the study were reported in accordance with the aims of the study.
- Is the work clearly and accurately presented and does it cite the current literature?

  Yes

- Is the study design appropriate and is the work technically sound?

  Yes

- Are sufficient details of methods and analysis provided to allow replication by others?

  Partly

- If applicable, is the statistical analysis and its interpretation appropriate?

Yes

○ Are all the source data underlying the results available to ensure full reproducibility?

No source data required

○ Are the conclusions drawn adequately supported by the results?

Yes

Competing Interests: I/we have no competing interests that might be construed to influence my/our judgment of the article's or peer review report's validity or importance.

Comments on this article

Version 2

Author Response 21 Apr 2022

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- Which are the study factors that could predict coping and social discrimination toward COVID-19 among HCWs and individuals with COVID-19?

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The findings, discussion and conclusion of the study were reported in accordance with the aims of the study.

- Is the work clearly and accurately presented and does it cite the current literature?

  Yes

- Is the study design appropriate and is the work technically sound?

  Yes

- Are sufficient details of methods and analysis provided to allow replication by others?

  Partly

- If applicable, is the statistical analysis and its interpretation appropriate?

  Yes

- Are all the source data underlying the results available to ensure full reproducibility?

  No source data required

- Are the conclusions drawn adequately supported by the results?

  Yes

Competing Interests: I/we have no competing interests that might be construed to influence my/our judgment of the article's or peer review report's validity or importance.

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