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Knowledge, Attitudes, and Beliefs of Pediatric Health Care Workers: Understanding the Response to COVID-19

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Introduction: This research aims to assess knowledge, attitudes, and beliefs of PHCW regarding COVID-19.

Method: Data collected using an electronic survey sent to pediatric health care workers.

Results: Age was not likely to influence willingness to care for patients with COVID-19. Males were more likely to be willing to care for patients than female. Nurse practitioners were more

likely to be willing to care for patients with COVID-19 than physicians. Availability of proper personal protective equipment, COVID-19 knowledge, and training did not influence willingness to care for COVID-19 patients. Healthcare workers with a higher risk of COVID-19-related sickness, and who received most of their COVID-19 information from social media, were less likely to be willing to care for COVID positive patients. As perception of hospital preparedness increased, reluctance to care for COVID-19 positive patients decreased.

Discussion: Hospital preparedness and social media exposure play a significant role in willingness to care for patients with COVID-19. *J Pediatr Health Care.* (2022) 36, 305–309

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INTRODUCTION

The COVID-19 pandemic has altered our way of life for the unforeseeable future. As we learn more about transmission and prevention of the disease, health care workers have arguably been the most impacted. Caring for those sickened by COVID-19 has placed a strain on the health care workers, who are on the front lines combating the disease and treating those infected. There is fear that treating infected patients increases the health care worker's risk of infection and may alter the worker's willingness to participate in providing care to this population. Understanding the attitudes of health care workers regarding COVID-infected patients will allow for better education and protection of these workers and help reduce occupational-related transmission risk. In addition, studying health care workers' attitudes related to caring for victims of the pandemic can help assess if workers are ready and willing to provide the appropriate care. For this research, health care workers will refer to those who

provide pediatric health care to pediatric patients in the hospital setting, including nursing staff, hospital management, respiratory therapy, radiology, child life, physicians, and social workers.

To better understand this, a look into how health care attitudes changed during previous pandemics can help approach the unknown during the COVID-19 outbreak. Literature addressing attitudes among health care workers during the following pandemics was reviewed: HIV, influenza type A virus, h1N1 flu (A/H1N1) also known as swine flu, and severe acute respiratory syndrome (SARS). Research found that the attitudes of the health care workers improved as they treated more HIV patients and gained experience with the disease. Once a health care worker had cared for an HIV patient, their attitudes became much more favorable (Berkowitz & Nuttal, 1996). SARS is most like COVID-19 because both are spread through airborne transmission. Most workers believed that washing hands often, wearing N-95 respirator masks, and using negative pressure isolation rooms were highly effective in helping to prevent spread. However, the need for reminders to wash hands and use personal protective equipment has increased because the practical use often-steered people away because of time consumption and discomfort (Imai, Takahashi, Hasegawa, Lim, & Koh, 2005; Parker & Goldman, 2006). Health care workers dealing with H1N1 and SARS most prevalent concerns were infection of family and friends and the health consequences of contracting the disease. Researchers found high levels of psychological distress, including a moderate-to-high degree of anxiety, among workers treating these diseases (Gouila, Mantas, Dimitroula, Mantis, & Hyphantis, 2010). There was a fear and anxiety about acquiring these diseases through their patients for all three pandemics but this did not stop the workers from caring for these affected populations (Berkowitz & Nuttal, 1996; Gouila, et al., 2010; Parker & Goldman, 2006). However, the attitudes were improved if the health care workers believed there was less perceived risk of infection through occupational exposure (Berkowitz & Nuttal, 1996). As more research emerged and a better understanding developed, attitudes of health care workers began to improve, leading to more open-minded and empathetic care for patients (Albano, Matuozzo, Marinelli, & Di Giuseppe, 2014; Kok, Guvenc, & Kaplan, 2018; Person et al., 2004). It is important to consider the attitudes of health care workers because of the direct impact attitudes have on behaviors—if health care workers have a positive attitude regarding their job, patient, employer, and so on, they could be more likely to provide quality care, as suggested in the cited studies above (Albano et al., 2014; Kok et al., 2018; Person et al., 2004). Extrapolating from the ideas of these previous studies, this study aims to assess pediatric health care workers' (PHCW) knowledge, attitudes, and beliefs about COVID-19.

METHODS

The study was conducted between November 9, 2020 and January 4, 2021 at a Children's Hospital in Toledo, OH.

Patients with COVID-19 were rising during this period, and PHCWs were beginning to have greater interactions with COVID-19 positive patients. The survey was taken either before or right as the vaccine had become available to health care workers, so vaccination was not included in the questions. A 34-item survey was created and disseminated via the online service SurveyMonkey. The survey was designed specifically for PHCWs to gauge their knowledge, attitudes, and beliefs about COVID-19.

The survey questions were chosen on the basis of a review of the literature involving HIV, influenza A/H1N1, and SARS outbreaks, as well as the ideas of the authors. Seventeen questions were multiple-choice, six questions were yes/no statements, three questions were yes/no/not sure statements, one question was a simple true/false statement, five questions were scored on a five-point Likert scale from strongly disagree (1) to strongly agree (5) or not effective (1) to extremely effective (5), and two questions were scored using a 10-point Likert scale from no stress (0) to extreme stress (10) or not at all infectious (0) to extremely infectious (10). The items were divided into five domains: demographics, knowledge of COVID-19, attitudes regarding COVID-19, behaviors, and beliefs.

Institutional Review Board approval was obtained and was found to be exempt.

Recruitment

An e-mail was sent to the nursing and departmental directors to ask permission to send the survey out to their personnel. All contacted departments agreed to participate. The surveys were distributed electronically via e-mail with weekly reminder e-mails sent by nursing and departmental directors. A description of the survey and informed consent were included in the e-mail. Personnel in nursing (general nurses and nursing aides), hospital management, respiratory therapy, radiology, child life, general pediatric floors, and pediatric subspecialties (physicians/faculty, which consists of medical doctors who have an academic title of faculty, and nurse practitioners), and social work were questioned. This combined population was grouped as PHCWs. Overall, 610 PHCWs were sent the e-mail, and 256 health care workers responded, providing a 42% response rate. Deidentified surveys were collected online. Participation in these surveys was voluntary but encouraged by nursing and department directors. A statement was provided at the end of the survey that directed participants to contact their primary care physician or employee assistance program if they experienced emotional distress while participating in the study.

Statistical Analysis

All study hypotheses were evaluated using SPSS (IBM SPSS Statistics for Windows, Version 25.0; IBM Corp., Armonk, NY). The present study was designed to examine multiple hypotheses falling under four aims. This study's first aim was to examine demographic factors that may influence health care workers' willingness to care for COVID-19 positive patients. Three hypotheses fall under this aim, denoted

1.1, 1.2, and 1.3. Hypothesis 1.1 states that health care workers' willingness to care for COVID-19 patients differs by occupational role. Hypothesis 1.2 states that health care workers' willingness to care for COVID-19 patients differs by health care worker age. Hypothesis 1.3 states that health care workers' willingness to care for COVID-19 patients differs by health care worker gender. Hypotheses 1.1 and 1.2 were examined via between-subjects analysis of variance tests with post hoc analyses to examine significant group differences. Hypothesis 1.3 was examined using a *t* test to compare the means between male and female health care workers on willingness to care for COVID-19 patients.

The second aim of this study was to examine the role of health care workers' perceptions of training and preparedness on willingness to care for COVID-19 positive patients. Two hypotheses fell under this hypothesis, denoted 2.1 and 2.2. Hypothesis 2.1 states that being provided proper personal protective equipment (PPE) will influence health care workers' willingness to care for a COVID-19 patient. This hypothesis was evaluated using an independent samples *t* test. Hypothesis 2.2 states that receiving training on caring for a patient with COVID-19 will influence health care workers' willingness to care for a COVID-19 patient. Hypothesis 2.2 was also evaluated by conducting an independent samples *t* test.

The third aim of the present study was to examine the influence of health care workers' knowledge and attitudes on their willingness to care for COVID-19 positive patients. Two hypotheses fall under the third aim, denoted 3.1 and 3.2. Hypothesis 3.1 states that health care workers' knowledge of COVID-19 will impact their willingness to care for COVID-19 positive patients. Hypothesis 3.2 states that health care workers' perceptions of their institution's preparedness would correlate with health care workers' stress levels because of COVID-19. Hypothesis 3.1 was evaluated by conducting a linear regression to ascertain if knowledge predicted willingness to care, and hypothesis 3.2 was evaluated by conducting a correlation analysis.

The fourth aim of the present study was to examine factors that influence health care workers' willingness to care for a COVID-19 positive patient. Three hypotheses fall under this aim, denoted 4.1, 4.2, and 4.3. Hypothesis 4.1 states that health care workers' beliefs of COVID-19 formed by social media will impact their willingness to care for a COVID-19 positive patient. Hypothesis 4.2 states that taking care of or being exposed to a patient with COVID will be correlated with changing home-life scenarios. If significant, both 4.1 and 4.2 were examined using correlation and linear regression analyses. Hypothesis 4.3 states that being personally diagnosed or knowing someone close who was diagnosed with COVID-19 will be related to making changes to home life. This hypothesis was examined by conducting a χ^2 analysis.

The fifth aim of the present study was to examine perceptions of self-risk and hospital preparedness in willingness to care for COVID-19 patients. Two hypotheses fall under this aim, denoted 5.1 and 5.2. Hypothesis 5.1 stated that health care workers' beliefs of self-risk would impact their

willingness to care for a patient, and hypothesis 5.2 stated that the health care workers' perception of hospital preparedness would impact their willingness. Both hypotheses were evaluated by conducting correlation and linear regression analyses.

RESULTS

The Table describes the respondents' demographics. A total of 256 PHCW completed the survey.

Under aim 1, hypothesis 1.1 stated that willingness to care for COVID-19 patients would differ by occupational role. Levene's homogeneity of variance test was not significant, indicating the variances are roughly equal and the assumptions have been met. Our hypothesis was supported such that there are significant differences between health care workers' willingness to care for COVID-19 patients depending on their occupational role ($F[3,225] = 7.72, p < .001$). Post hoc analyses revealed that respiratory therapists were significantly more likely to care for a COVID-19 patient than physicians/faculty ($p = .001$) and those who indicated others ($p = .007$). Nurse practitioners were also significantly more likely to care for COVID-19 patients than physicians/faculty ($p = .006$). Hypothesis 1.2 stated that health care workers' willingness to care for COVID-19 patients would differ on the basis of the respondent's age. Our hypothesis was not supported as there were no significant differences in willingness to care for a COVID-19 patient based on the respondent's age ($F[4,224] = 0.39, p = .835$). Hypothesis 1.3 stated that health care workers' willingness to care for COVID patients would differ on the

TABLE. Demographics of respondents

Demographics	<i>n</i>	%
Sex assigned at birth		
Male	35	13.6
Female	219	85.2
Race		
Black/African American	5	1.9
Asian/Pacific Islander	4	1.6
American Indian/Alaskan Native	0	0
Hispanic/Latinx	7	2.75
White/Caucasian	238	93
Other/multiple	4	1.6
Age		
≤ 29 years	84	32.7
30–39 years	75	29.2
40–49 years	54	21.0
50–59 years	26	10.1
≥ 60 years	16	6.2
Current role		
Respiratory therapist	15	5.8
Nurse practitioner	28	10.9
Physician/faculty	144	56.0
Other	68	26.5
Personally diagnosed with COVID-19 in 2020 or had someone close diagnosed with COVID-19 in 2020		
Yes	130	50.6
No	121	47.1
Unsure	4	1.6

basis of their gender. Levene's test of variance was not significant, indicating the variances are roughly equal and the assumptions have been met ($p = .837$). Our hypothesis was supported as male health care workers are significantly more likely to care for a COVID patient than female health care workers ($t[226] = 2.34, p = .020$).

Regarding aim 2, hypothesis 2.1 stated that being provided proper PPE would influence health care workers' willingness to care for a COVID patient. Levene's test of variance was not significant, indicating the variances are roughly equal and the assumptions have been met ($p = .343$). Our hypothesis was not supported as being provided proper PPE did influence health care workers' willingness to care for a COVID patient ($t[227] = -1.07, p = .287$). Hypothesis 2.2 states that receiving training on how to care for COVID-19 patients would influence health care workers' willingness to provide care. Levene's test of variance was not significant, indicating the variances are roughly equal and the assumptions have been met ($p = .465$). Our hypothesis was not supported as receiving training on caring for patients with COVID did not predict health care workers' willingness to care for a COVID patient ($t[224] = -1.48, p = .141$).

Under aim 3, hypothesis 3.1 stated that knowledge of COVID-19 would impact health care workers' willingness to care for COVID-19 positive patients. Our hypothesis was not supported as knowledge of COVID-19 did not predict health care workers' willingness to care for COVID-19 patients ($F[1,227] = 0.01, p = .933$). In addition, we examined if knowledge of COVID-19 impacted health care workers' decisions to not work with a COVID-19 patient if given the option. This relationship was also not significant ($F[1,227] = 0.682, p = .410$). Hypothesis 3.2 stated that health care workers' perceptions of institutional preparedness would be associated with their stress levels because of COVID-19. Our hypothesis supported a significant negative correlation between perceptions of institutional preparedness and stress levels, $r = -0.25, p < .001$. Furthermore, the results suggest that the higher the perceptions of institutional preparedness, the lower the stress levels.

For aim 4, we hypothesized (4.1) that health care workers' beliefs about COVID-19 formed by social media would impact their willingness to care for a COVID-19 positive patient. Our hypothesis was supported such that there was a significant positive relationship between beliefs about COVID-19 formed by social media and one's willingness to care for a COVID-19 positive patient ($r = 0.16, p = .042$). Thus, those who believed that social media formed their beliefs around COVID-19 were more unwilling to care for a COVID-19 patient. Participant sex ($F[4,153] = 0.52, p = .719$), age ($F[4,154] = 2.31, p = .061$), and health care worker role ($F[3,158] = 1.66, p = .177$) did not significantly or differentially change how health care workers perceived social media influencing their beliefs and views of COVID-19. Thus, no study parameters measured affected the influence of social media on COVID-19 beliefs. In addition, beliefs about COVID-19 formed by social media significantly predicted health care workers' willingness to care for

a COVID-19 positive patient ($F[1,157] = 4.22, p = .042$). In addition, health care workers' whose beliefs about COVID-19 were formed by social media were also more likely to not care for a COVID-19 patient if they had the option ($r = 0.21, p = .008$). Similarly, beliefs about COVID-19 formed by social media significantly predicted a health care worker's decision to not care for a COVID-19 patient if they had the option ($F[1,157] = 7.30, p = .008$). Hypothesis 4.2 stated that taking care of or being exposed to a patient with COVID will be correlated with changing home-life scenarios. Our hypothesis was not supported as there was no significant correlation between the two variables ($r = 0.03, p = .663$). Hypothesis 4.3 stated that being personally diagnosed or knowing someone close who was diagnosed with COVID-19 will be related to making changes to home life. A χ^2 test was conducted because of the categorical nature of the predictor variable. Our hypothesis was not supported, ($\chi^2[16,223] = 14.36, p = .572$).

For aim 5, Hypothesis 5.1 stated that respondents' perceptions of self-risk would impact their willingness to care for a COVID-19 positive patient. Our hypothesis was supported such that respondents who perceived higher levels of self-risk were also more likely to feel reluctant in working with a COVID-19 patient ($r = 0.22, p = .001$). Furthermore, perceptions of self-risk significantly predicted health care workers' willingness to treat a COVID-19 positive patient ($F[1,219] = 11.47, p = .001$). Finally, hypothesis 5.2 stated that health care workers' perceptions of hospital preparedness would impact their willingness to care for COVID-19 patients. Our hypothesis was supported as the results suggest that as health care workers' perceptions of hospital preparedness increased, their reluctance to treat a COVID-19 patient decreased ($r = 0.17, p = .010$). Furthermore, health care workers' perception of hospital preparedness was a significant predictor of their willingness to care for COVID-19 patients ($F[1,219] = 6.71, p = .010$).

DISCUSSION

This study aimed to gather data to provide information that reflects the knowledge, attitudes, and beliefs of health care workers and their response to the COVID-19 pandemic and review past pandemic responses to improve future pandemic responses. In addition, this research sought to bolster the health care worker community with positive, fact-driven, and evidence-based information to better serve both the health care community and the community. Learning from previous surveys, we hypothesized that institutional preparedness would be associated with stress levels because of COVID-19. The significant negative correlation of this relationship supported by the data poses an opportunity for our health care institutions to better support their health care workers' wellness in the setting of a novel or recurrent epidemics. Putting forth an ongoing effort of preparedness that is institution-wide may decrease stress for those health care workers facing the daily battles.

Interestingly, this research also found that being provided proper PPE would not likely influence health care workers' willingness to care for a COVID-19 patient (this hypothesis

produced a statistically insignificant result). This could be because of the time required to use proper PPE, a lack of understanding of putting on and taking off properly, or the belief that PPE provides a significant increase in protection from the virus. An additional struggle of this pandemic was that at its beginning, there was an overwhelming shortage of PPE across the nation and among many institutions. This shortage added stress to health care facilities, their workers, and the community.

The authors found particularly relevant to today's climate is the impact of social media on PHCW's perception of COVID-19 and how it affected their willingness to care for COVID-19 patients. The social media platforms investigated included Facebook, Instagram, Snapchat, and Twitter. Social media has become a large influence in shaping peoples' opinions on all topics. At the institution surveyed, the more information gained through social media about COVID-19 led to a decreased willingness to care for COVID-19 patients. This is significant because social media does not filter between true and false information, which can cause biased options and skew people's mindsets on various topics (Gralinski & Menachery, 2020; Karasneh et al., 2021). Institutions can take note of the unique influence of social media and use it to their advantage by providing accurate information through their social media platforms. Sharing correct information could still lead to negative outlooks on providing patient care, but at least the decisions would be more likely to be made on the basis of accurate, unbiased information.

We found that respiratory therapists were significantly more likely to care for a COVID-19 patient than a physician/faculty, and nurse practitioners were also significantly more likely to care for COVID-19 patients than physicians/faculty. Willingness to care for a COVID-19 patient in person did not vary by age but by gender, as male health care workers were more likely than females to care for a COVID-19 patient. Being provided proper PPE did not influence health care workers' willingness to care for a COVID-19 patient; similarly, receiving training on caring for patients with COVID also did not predict health care workers' willingness to care for a COVID-19 patient. Knowing COVID-19 did not impact health care workers' willingness to care for COVID-19 patients. Health care workers' perception of institutional preparedness was significantly negatively correlated with health care workers' stress levels. Health care workers who reported that social media formed their beliefs around COVID-19 were more unwilling to care for a COVID-19 patient than health care workers not impacted by social media coverage of COVID-19. There was no significant relationship between caring for a COVID-19 patient and making changes to home-life scenarios and being personally diagnosed with COVID-19 or knowing someone close who also did not impact health care worker decisions to make changes to home-life scenarios. Health care workers who had a higher level of perceived self-risk were more likely to be reluctant to care for COVID-19 patients; their perceptions of hospital preparedness also impacted their willingness to care for COVID-19 patients.

This study has two main limitations. First, respondents completed the survey either right before or right as the vaccine had become available to health care workers. The timing of the survey completion likely impacted responses. This survey was distributed before the emergence of the Delta variant. In addition, the sample was taken from one hospital in one geographic area and therefore may not be representative of other health care workers across the country.

Future research could involve the inclusion of fear-based questions so that researchers could understand where the fear stemmed from, such as fear for themselves, for their families, or from the potential spread of the virus to others could provide meaningful perspectives. In addition, questions about burnout would be noteworthy because viewpoints may alter as the workers see the true effects of the virus on their patients.

Conclusion

These findings demonstrate that health care workers' knowledge, attitude, and beliefs about COVID-19 may have impacted stress levels and willingness to provide care for COVID-19 positive patients. Multifactorial perception of self-risk led to a decrease in willingness to care for patients with COVID-19. For future pandemics, institutional preparedness and positive use of social media to distribute accurate information may decrease health care worker stress and increase willingness to provide patient care. Future research is necessary to determine which aspects of hospital preparedness would decrease health care workers' stress and improve the number of workers willing to provide patient care.

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