

Assessment of the healthcare workers' physical, educational and operational needs during the COVID-19 pandemic in Bahrain

Needs of HCWs
during
COVID-19

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Abstract

Purpose – This study sought to understand the physical, educational and operational needs faced by healthcare workers (HCWs) (including physicians, nurses and allied health workers) during the COVID-19 pandemic.

Design/methodology/approach – A descriptive cross-sectional design was undertaken. HCWs working in hospitals, health centers, testing and quarantine areas in the Kingdom of Bahrain were invited to complete the online survey questionnaire developed by authors containing three domains: physical, educational, and perceived knowledge, and operational needs.

Findings – A convenient sample ($N = 627$) of volunteered participants responded to the online survey. The biggest challenges that HCWs were exposed to are physical needs (experiencing dry hands, difficulty breathing while on a mask, feeling hot and sweaty, and less fluid and food intake) which were reported as the higher level, followed by operational needs (limited communication due to Personal Protective Equipment - PPE - use, longer working hours, and preparation time to get ready for duty). Other challenges pertained to education and knowledge (the presence of multiple sources of information confused them during the care practices). Females faced more challenges than males, and Bahraini HCWs handled challenges more than non-Bahrainis. A negative relationship was found between age and years of experience with the challenges of the HCWs.

Originality/value – During the COVID-19 pandemic, health systems face rapidly increasing demands. HCWs face several challenges while providing patient care, particularly physical needs. This study provides adequate data for healthcare administrators to maintain a safe working environment during pandemics.

Keywords COVID-19, Pandemic, Healthcare workers, Challenges, Needs, Physical, Operational, Educational
Paper type Research paper

Introduction

The global COVID-19 pandemic has created enormous demands on healthcare systems (Holmes *et al.*, 2020; Xiang, Jin, & Cheung, 2020) as well as frontline healthcare workers

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(HCWs) in different service areas to maintain adequate and timely services (Cadogan and Hughes, 2020). In any case, the World Health Organization (WHO) has identified that frontline HCWs during the COVID-19 pandemic are at risk for developing physical symptoms including but not limited to: fever, cough, weakness, cutaneous manifestations and skin damage, and nasal bridge (de Pablo *et al.*, 2020; Shaukat, Ali, & Razzak, 2020); and psychological deficiencies: depression, anxiety, insomnia and distress (de Pablo *et al.*, 2020; Greenberg, Docherty, Gnanapragasam, & Wessely, 2020). This results from working directly or indirectly with COVID-19 patients (de Pablo *et al.*, 2020). The needs of HCWs should be prioritized to sustain adequate healthcare services for 24hrs per day. The number of HCWs infected with COVID-19 in Bahrain has been increasing over time, according to the National Taskforce Team to combat COVID-19 and the Ministry of Health (MOH) report (*Bahrain Ministry of Health Report, 2020*). Since February 2020, when the first Coronavirus (COVID-19) infected case was identified in Bahrain, the National Taskforce Team has expanded its plan and created a daily information update system for all HCWs (*Ministry of Health confirms first case of Coronavirus disease in Bahrain, 2020*).

A literature review of this subject revealed that the most affected service providers were nurses, physicians, dentists, pharmacists, laboratory technicians, radiology staff, paramedics and mobile testing unit clinical staff (CDC Health Alert Network, 2020a; Centers for Disease Control and Prevention (CDC), 2020b; Du *et al.*, 2020). The regular work shift for nurses has also been impacted due to the increased number of COVID-19 patients. Instead of the usual 8 regular working hours, 12-hour shifts are now being demanded on a national level, which is noted by other places an increase in workload by 1.5 to 2 times, as reported in China (Sun *et al.*, 2020).

Although the WHO and Centers for Disease Control and Prevention (CDC) have published many materials, online training sessions and recommendations for the prevention and control of COVID-19 for HCWs (CDC Health Alert Network, 2020a; CDC, 2020b; East, 2020; World Health Organization, 2020), the need for assessing HCWs' knowledge level is essential because they are the primary sector in contact with patients and are an important source of exposure to infected cases in healthcare settings; thus, HCWs are expected to be at high risk of infection (Bhagavathula, Aldhaleei, Rahmani, Mahabadi, & Bandari, 2020). On a few occasions, mistaken assumptions among HCWs have postponed controlling efforts to give necessary treatment (Hoffman and Silverberg, 2018); knowledge can influence the perceptions of HCWs due to their past experiences and beliefs (Oppenheim *et al.*, 2019). However, the level of knowledge and perceptions of HCWs toward COVID-19 are still not being well tested and remain unclear.

Due to the COVID-19 outbreak, health systems are confronted with rapidly increasing demands on services, HCWs, medication, equipment and supplies. A system's ability to maintain routine service delivery in addition to essential health services will depend on its baseline capacity. When caseloads are high or the health workforce is reduced due to infection of health workers, strategic shifts are required to ensure that increasingly limited resources provide maximum benefit for a population (Nguyen *et al.*, 2020; WHO, 2020).

HCWs are exposed to many threats due to COVID-19, such as fear of increased likelihood of contracting the virus (Cai *et al.*, 2020; Huang, Lin, Tang, Yu, & Zhou, 2020), dealing with physical needs due to exhaustion (de Pablo *et al.*, 2020), poor educational and training preparation (Bhagavathula *et al.*, 2020; Kliger, Cozzolino, Jha, Harbert, & Ikizler, 2020), as well as the prolonged use of protective equipment and duty operational resources issues (Kliger *et al.*, 2020; Xie *et al.*, 2020). Understanding the urgency of the situation and uncertainty of the disease in an environment where HCWs face heightened health risks creates a challenge for healthcare organizations. Therefore, assessing the physical, educational and operational needs of the HCWs becomes crucial.

Through literature review, the researchers concluded that the information provided in the literature about physical outcomes that burden healthcare providers during the COVID-19 pandemic is scarce, especially regarding HCWs on the front line. Physical exhaustion is due to prolonged hours of work (Centre for disease control and prevention, 2020), inadequate rest (Shaukat *et al.*, 2020), and nutrition and hydration needs (Irene, Alik, & Hellas, 2021). In addition, the rapid update of COVID-19 information and knowledge has made HCWs uncertain regarding their latest practice knowledge and management (de Pablo *et al.*, 2020). This requires conducting continuous educational activities and learning new techniques to meet patient needs and reduce HCW challenges. Operational needs for HCW are the items that we tend to ignore, for example, the time and money cost of getting ready for work, washing uniforms, driving to work, preparing meals for work, time spent with family, if extra working hours are paid or not, and the availability of protective equipment during work time. Through our understanding of the current COVID-19 pandemic, preventing future pandemics will require a sustainable investment in HCWs. There need to be decent working conditions, training and equipment, especially about PPE and occupational safety measures. A dialogue within the community is essential to build a resilient health system that can respond to crises and prepare for future health emergencies and pandemics. The pressure on HCWs continues to develop with surges of COVID-19 cases. To ensure the safety of patients and HCWs and utilize resources efficiently, the assessment of HCW needs (physical, educational and operational) is essential. The findings of this study could be beneficial for healthcare administrators, educators and institutional improvement.

This study sought to assess the HCWs' physical, educational and operational needs during the COVID-19 pandemic. In addition, factors contribute to the needs faced by HCWs.

Methods

Design and setting

A cross-sectional descriptive study design was used to conduct this study at the national level in the Kingdom of Bahrain. The study included government and nongovernmental hospital HCWs.

Participants

The sample size needed for this study was computed using power analysis software. To obtain a power of 0.8, a confidence interval of 95% and an estimated medium effect size, a sample size of 385 HCWs was required for the study. A convenience sampling technique was followed in selecting the participants. All (frontline) HCWs in practice in hospitals, health centers, testing areas and quarantine areas in the Kingdom of Bahrain were included at the time of data collection. Those working in administrative positions and not providing direct patient care were excluded.

Measurement tool

The questionnaire consisted of participants' sociodemographic data, and the Health Care Workers Needs Survey (HCWNS) was used to collect the data. Participants' sociodemographic characteristics include variables related to age, gender, marriage status, nationality, educational level, duration of work experience, job category, place of work, if they received any training, education on COVID-19 management in their institutions if they handled or screened suspected or confirmed COVID-19 patients, and if they have any symptoms during the period of their care for patients infected with or were suspected of being infected with the COVID-19 virus. The HCWNS has 27 items developed by the researchers

after a thorough literature review (Bhagavathula *et al.*, 2020; Centre for disease control and prevention, 2020; de Pablo G *et al.*, 2020; Irene *et al.*, 2021; Kao *et al.*, 2004; Kelechi, Brunette, & Lee, 2020; Lim *et al.*, 2006; National Nurses United, 2020; Ramaci, Barattucci, Ledda, & Rapisarda, 2020; Shaukat *et al.*, 2020; Sun *et al.*, 2020; WHO, 2020) to provide a comprehensive assessment of HCWs' needs. Each item is rated on a 5-point Likert scale and rates responses from 0 to 4 (4 = always happens "five times a week to daily," 3 = often happens "three to four times a week," 2 = sometimes happens "once a week," 1 = rarely happens "once a month," 0 = never happened "not at all"). The mean score ranged from 0 to 4, with a higher score suggesting higher challenges and needs perceived by HCWs. The scale consists of three subdomains: (1) physiologic domain assessment (10 items), (2) educational and perceived knowledge domain (9 items) and (3) operational needs domain and use of PPE (8 items).

Validity and reliability of the HCWNS

The face validity and content validity index (CVI) testing of this tool were carried out; face validity was demonstrated through consultation with three experts who were required to evaluate the items concerning appropriate wording and grammar, understandability and relatedness and to mention their suggestions, if any, next to each item. Then, the questionnaires were collected, and the recommendations were considered. The modified questionnaire was then given to three physicians, three nursing Ph.D. holders, and two individuals with MSN degrees and currently working as first-line nurse managers in nursing to evaluate the CVI to analyze the items concerning relativity, simplicity and clarity, using a 4-point Likert scale ranging from 1 (the lowest relative) to 4 (the highest relative) (Waltz, Strickland, & Lenz, 2016). After that, seven out of eight questionnaires were collected. The item-CVI (I-CVI) was computed as the number of experts giving a rating of relevant or very relevant on the 4-point Likert scale divided by the total number of experts; the value of at least 0.83 was acceptable to consider the item as relevant when evaluated by seven experts (Yusoff, 2019), amendments and modifications were done accordingly. Similarly, Scale-level CVI (S-CVI) is the most usually used content validity approach. It has two methods to be calculated: the Universal Agreement CVI (S-CVI/UA) and a less conservative method, the Average CVI (S-CVI/Ave). An S-CVI/UA ≥ 0.8 and an S-CVI/Ave ≥ 0.9 have excellent content validity (Polit and Beck, 2008; Rodrigues, Adachi, Beattie, & MacDermid, 2017).

Ethical consideration and data collection

Permission to conduct the study was secured by the Institutional Review Board [Ref #21-390], Research and Ethics Committees [BDF/R&REC/2021-565] and Research Committee for Government Hospitals [no: 4130122] for the participating hospitals.

The study was opened to government and nongovernmental HCWs.

The researchers developed an electronic tool (HCWNS) and sent it as a link to HCWs through official e-mails to their respective institutions and screening centers.

The study was explained to all participants before they were given the option to participate through the informed consent that was placed in the first part of the questionnaire, which includes a brief description of the study, the names of the investigators and their contact details, voluntary participation, and a statement relating to anonymity and the right to withdraw; the remaining of the questionnaire cannot be shown without clicking the agree button that considered as a signature. Completing the questionnaire is also taken into consideration as consent. The study has minimal risk as there is no identification of participants, a code book developed to avoid duplication of answers, and for data entry and analysis purposes only. Approximately 10 min were required to complete the questionnaire.

Statistical analysis

The Statistical Packages for Social Sciences (SPSS), version 25, was utilized for data analysis. The researcher used a web-based survey for the mailed-out questionnaire. General basic descriptive statistics, including frequencies, percentages, means and standard deviation (SD), were performed to describe participants' sociodemographics and identify physical, educational and training, and operational needs faced by HCWs during the COVID-19 pandemic, and symptoms experienced. The total score of responses was calculated to identify the most common needs (top three needs); the highest score reflects the most common needs reported by HCWs. After we reverse-coded the negatively worded items, the normality tests were performed. To test the relationship between age and years of experience with HCWNS, Pearson's *r* was used. The *t*-test and ANOVA test were used to determine whether there is a significant difference in means in the sociodemographic data and the HCWNS; the test was chosen based on the number of independent groups.

Results

Sociodemographic data

The study sample is composed of 627 participants. Of these participants, 495 (78.9%) were female, with mean age of 34.88 years old (SD = 7.65). An unequal number of HCWs were Bahraini (*n* = 264, 42.1%), while the remaining were from different nationalities (*n* = 363, 57.9%), which are Indian, Filipino, Jordanian, Egyptian, Pakistani, Saudi, Iraqi, Lebanese, Turkey, Icelandic, Malaysian and French. Tables 1 and 2 show the descriptive statistics about the participant's sociodemographic and professional characteristics.

Validity and reliability of the HCWNS

The I-CVI for the HCWNS ranges from 0.86 to 1, S-CVI/UA was 0.81 and S-CVI/Ave was 0.97.

Furthermore, the internal consistency reliability analysis of all composite variables studied in this research was conducted using Alpha Cronbach's coefficients. The 27-item

Frequency and percentage distribution of HCWs according to sociodemographic characteristics (*N* = 627)
(Mean ± SD¹)

Age		34.88 ± 7.65
Gender	Male	132 (21.1)
	Female	495 (78.9)
Marital status	Single	137 (21.9)
	Married	473 (75.4)
	Divorced	15 (2.4)
	Widowed	2 (0.3)
Nationality	Bahraini	264 (42.1)
	Non-Bahraini	363 (57.9)
Educational level	High school	3 (0.5)
	Undergraduate (student)	2 (0.3)
	Diploma	159 (25.4)
	BSc	398 (63.5)
	High diploma	16 (2.6)
	Master's	38 (6.1)
	Ph.D./Doctorate	11 (1.8)

Note(s): 1 SD: standard deviation

Table 1.
The descriptive
statistics –
sociodemographic
characteristics

Frequency and percentage distribution of HCWs according to professional characteristics ($N = 627$)
(Mean \pm SD¹)

Total years of experience		11.28 \pm 6.9
Job category	Nurses	542 (86.4)
	Physicians	53 (8.5)
	Allied healthcare	32 (5.1)
Place of work	KHUH/BOC	148 (23.6)
	Regulatory organization	8 (1.3)
	MOH	69 (11.0)
	BDF	398 (63.5)
	Private	4 (0.6)
Are you handling or screening suspected or confirmed COVID-19 patients?	No	292 (46.6)
	Yes	332 (53.0)
Did you receive training and education on the management of COVID-19 patients?	No	202 (32.2)
	Yes	425 (67.8)
Were you tested positive for COVID-19?	No	441 (70.3)
	Yes	186 (29.7)

Table 2.
The descriptive statistics – professional characteristics

Note(s): 1 SD: standard deviation

HCWNS Cronbach's alpha was (α -0.87). The subdomain-wise Cronbach's alpha was the Physiologic Needs Domain (α -0.86), the Education and Perceived Knowledge Domain (α -0.76) and the Operational Needs Domain (α -0.78).

Description of the HCWs' needs during the COVID-19 pandemic

The mean value of the surveyed respondents of the physiologic domain set of questions ranged between 2.00 ± 1.46 and 3.22 ± 1.18 . The highest mean of 3.22 was found for (I experience dry hands due to frequent hand hygiene), while the relatively lowest mean of 2.00 was found for (I experience urine retention due to prolonged PPE use).

The mean value of the surveyed respondents of the Education and Perceived Knowledge Domain set of questions ranged between 0.15 ± 0.63 and 1.35 ± 1.21 . The highest mean 1.35 was found for (I am confused with many sources of information regarding COVID-19). While the relatively lowest mean of 0.15 was found for the reversed score (I perform hand hygiene after performing PPE removal). The mean value of the surveyed respondents of the Operational Needs Domain set of questions ranged between 1.20 ± 1.34 and 2.48 ± 1.37 . The highest mean of 2.48 was found for (The use of PPE limits my communication with others). At the same time, the lowest mean of 1.2 was found for (There are no clear guidelines to specifically address employees with suspected or known exposure to COVID-19). The overall mean score perceived by the HCWs in the Physiologic Needs Domain was the highest. While the mean \pm SD for total HCWNS was 1.71 ± 0.62 .

Tables 3 and 4 show the mean and SD for the items, domains and overall HCW needs.

Correlational analysis

Table 5 shows the correlational analysis results using the parametric Pearson correlation method.

A statistically significant negative correlation was found between age and years of experience with total HCWs' needs and the three domains of HCWNS (Physiologic, Education

				Needs of HCWs during COVID-19
Item no.	Item	Mean	SD	
1	<i>It is hard to breathe while on a prolonged face mask/N95 mask at work</i>	2.77	1.24	<p>Table 3. The level of items, domains and total HCW needs (<i>n</i> = 627)</p>
2	I experience facial skin changes like contact/irritant dermatitis with blisters and acne	2.17	1.51	
3	I experience pressure skin injuries over the nasal bridge, skin dryness, tightness and desquamation due to the prolonged use of face masks	2.20	1.50	
4	<i>I experience dry hands due to frequent hand hygiene</i>	3.22	1.18	
5	<i>I have less fluid intake due to prolonged PPE use</i>	2.62	1.41	
6	I have less food intake due to prolonged PPE use	2.27	1.41	
7	I experience urine retention due to prolonged PPE use	2.00	1.46	
8	<i>I feel uncomfortably hot and sweaty due to prolonged PPE use</i>	2.77	1.36	
9	I suffer from pain after every COVID-19 swab test performed on me	2.04	1.29	
10	I have difficulty sleeping after my duty	2.08	1.33	
11	I feel that my knowledge and skills in handling COVID-19 are not enough	1.19	1.16	
12	I feel that my training in COVID-19 management is insufficient	1.21	1.21	
13	<i>With all the recent updates in COVID-19 management, I have doubts if I'm doing the right thing</i>	1.27	1.22	
14	<i>I am confused with many sources of information regarding COVID-19</i>	1.35	1.21	
15	I feel that my knowledge regarding the proper usage of PPE is inadequate	0.72	1.06	
16	I did not receive my training on the safe donning and doffing of PPE	0.70	1.26	
17	I follow the sequence of PPE removal and disposal (R)	0.52	1.12	
18	I perform hand hygiene before wearing PPE (R)	0.30	0.82	
19	I perform hand hygiene after performing PPE removal (R)	0.15	0.63	

Item no.	Item	Mean	SD	<p>Table 4. The level of items, domains and total HCW needs (<i>n</i> = 627)</p>
20	<i>The use of PPE limits my communication with others</i>	2.48	1.37	
21	There is not enough physical space provided while working	1.74	1.40	
22	It takes more time to prepare myself to get ready for duty than pre-COVID-19	1.91	1.45	
23	<i>I experience longer working hours during this pandemic</i>	2.45	1.42	
24	There is an insufficient number of PPE stock available to protect staff in the current situation and during a rapid surge of patients	1.39	1.37	
25	There is a limited number of rooms to isolate patients with COVID-19	1.90	1.48	
26	There is limited availability of N95 masks	1.57	1.46	
27	There are no clear guidelines to specifically address employees with suspected or known exposure to COVID-19	1.20	1.34	
Summary statistics of the composite variables				
A	<i>The physiologic needs domain</i>	2.41	0.91	
B	The education and perceived knowledge domain	0.82	0.64	
C	The operational needs domain	1.83	0.88	
The total of HCW's needs		1.71	0.62	

and Perceived Knowledge, and Operational Needs Domain). Thus, as the age and years of experience increase, the HCWs' needs level decreases.

Bivariate analysis for demographic effects

Table 6 shows a significant association between HCWNS and many sociodemographic and professional characteristics. The mean HCWNS for the female group was higher than the

Variables		1	2	3	4	5	6
1. Age in years	Pearson correlation Sig. (2-tailed)	1					
2. Work experience (years)	Pearson correlation Sig. (2-tailed)	0.821**	1				
3. Physiologic domain	Pearson correlation Sig. (2-tailed)	-0.195**	-0.202**	1			
4. Education and perceived knowledge domain	Pearson correlation Sig. (2-tailed)	-0.164**	-0.123**	0.178**	1		
5. Operational needs domain	Pearson correlation Sig. (2-tailed)	-0.184**	-0.163**	0.504**	0.436**	1	
6. Total HCWs' needs	Pearson correlation Sig. (2-tailed)	-0.238**	-0.219**	0.811**	0.620**	0.839**	1
		0.000	0.000	0.000	0.000	0.000	

Note(s): **. Correlation is significant at the 0.01 level (2-tailed)
*. Correlation is significant at the 0.05 level (2-tailed)

Table 5.
Pearson correlation matrix result with selected variables ($N = 627$)

mean HCWNS for the male ($p = 0.015$), for Bahraini is higher than non-Bahraini ($p < 0.001$), and the single was higher than married ($p < 0.001$). The HCWs handling or screening suspected or confirmed COVID-19 patients perceived a higher level of needs than those who didn't receive those types of patients ($p < 0.001$). HCWs who received training and education on managing COVID-19 patients perceived lower HCWNS mean than those who did not receive training ($p < 0.001$). In contrast, there is no significant difference in the mean of the HCWNS among different job categories and HCWs who tested positive for COVID-19.

Similarly, there is a significant difference for a group of participants who received training and education on the management of COVID-19 compared with those who did not receive it when comparing the mean Education and Perceived Knowledge Domain ($p < 0.001$).

In addition, all possible pairwise comparisons were made for marital status using the Tukey HSD test (using $\alpha = 0.05$); it showed that the single and married groups differed significantly. Similarly, all possible pairwise comparisons were made for the educational level using the Tukey HSD test (using $\alpha = 0.05$); it showed that the Ph.D./Doctorate and undergraduate (student) differed significantly; other groups were not significantly different from others. Furthermore, a one-way between-S ANOVA was done to compare the mean scores on HCWNS with the participants' Place of Work (Group 1 = KHUH/BOC, Group 2 = Regulatory organization, Group 3 = MOH, Group 4 = PDF, Group 5 = Private). Before the analysis, Levene's test for homogeneity of variance was used, and no significant violation was found $F(4, 622) = 0.108, p = 0.980$ for the level of HCWs' needs. The overall F for the one-way ANOVA testing the difference between the Place of work and the HCWs' needs level was not statistically significant, $F(4, 622) = 1.77, p = 0.134$.

Finally, the HCWs were asked to report symptoms they experienced during their care for patients infected with or suspected of being infected with the COVID-19 virus. Table 7 shows the frequency of having the symptoms.

Needs of HCWs during COVID-19

	Homogeneity of variance (Levene's test)	Mean HCWNS M ± SD	Df	Statistical test	p-value	M ± SD education and knowledge domain
<i>Gender</i>						
Male	F = 0.10, p = 0.919	1.59 ± 0.63	625	t = -2.435	0.015	
Female		1.74 ± 0.62				
<i>Nationality</i>						
Bahraini	F = 0.912, p = 0.340	1.88 ± 0.63	625	t = 5.857	<0.001	
Non-Bahraini		1.59 ± 0.59				
<i>Marital status</i>						
Single	F (3, 623) = 0.969, p = 0.407	1.92 ± 0.57	3, 623	F = 7.409	<0.001	
Married		1.65 ± 0.62				
Divorced		1.59 ± 0.70				
Widowed		1.89				
<i>Level of education</i>						
High school	F (6, 620) = 0.81, p = 0.564	2.260 ± 0.28	6, 620	F = 2.57	0.018	
Undergraduate (student)		2.89 ± 0.68				
Diploma		1.67 ± 0.67				
BSc		1.72 ± 0.60				
High diploma		1.77 ± 0.53				
Master's		1.77 ± 0.64				
Ph.D. and		1.32 ± 0.54				
Doctorate						
<i>Job category</i>						
Nurses	F (2, 624) = 0.173, p = 0.841	1.70 ± 0.62	2, 624	F = 1.41	0.246	
Physicians		1.81 ± 0.62				
Allied healthcare		1.59 ± 0.68				
<i>Handling or screening suspected or confirmed COVID-19 patients?</i>						
Yes	F = 2.063, p = 0.151	1.80 ± 0.60	625	t = -3.835	<0.001	
No		1.60 ± 0.64				
<i>Receiving training and education on the management of COVID-19 patients (to the total HCWs needs)</i>						
Yes	F = 2.162, p = 0.142	1.64 ± 0.60	625	t = 4.139	<0.001	
No		1.86 ± 0.65				
<i>Have you tested positive for COVID-19?</i>						
Yes	F = 5.861, p = 0.016	1.74 ± 0.57	390	t = -0.722	0.470	
No		1.70 ± 0.64				
<i>Receiving training and education on the management of COVID-19 patients</i>						
Yes	F = 14.636, p = 0.000		329.5	t = 8.845	<0.001	0.67 ± 0.55
No						1.15 ± 0.68

Note(s): t: t-test, F: ANOVA test

Table 6. Association between sociodemographical characteristics and HCWNS levels (N = 627)

Discussion

This study reveals essential facts about the HCWs' needs during the COVID-19 pandemic in Bahrain; the majority were female, with an average of 11 years of experience. More than 80% of respondents were nurses, indicating that nurses, including midwives, registered and practical nurses, are the main frontline HCWs competing the pandemic, followed by

Symptoms	Number (Yes)	Percentage
Have symptoms	259	41.3%
Fever	144	23%
Chills	56	8.9%
Dry cough	165	26.3%
Productive cough	54	8.6%
Dyspnea, Sob	81	12.9%
Nasal congestion	163	26%
Headache	306	48.8%
Sore throat	225	35.9%
Fatigue	225	35.9%
Nausea and vomiting	60	9.6%
Diarrhea	70	11.2%
Myalgia	57	9.1%
Smell or taste loss	71	11.3%
Weakness	167	26.6%

Table 7.
Frequency of having
symptoms (N = 627)

physicians, dentists, and allied health workers and technicians. This is reported by most COVID-19-related studies (Vizheh, Qorbani, Arzaghi, Muhidin, Javanmard, & Esmaeili, 2020).

Most HCWs in this study were from governmental hospitals, with approximately 58% non-Bahraini immigrant HCWs. In comparison, 42% are Bahraini, reflecting the diversity in Bahrain's healthcare workforce and indicating the need for more trained national HCWs to secure and strengthen health services and ensure culturally competent care (Maben, Al-Thowini, West, & Rafferty, 2010). When we examined challenges handling COVID-19 patients, females had higher challenges because female workers feared the risk of transmitting the infection to their families (Hall, 2020) and were concerned about their skin and physical appearance (Moradi, Baghaei, Hosseingholipour, & Mollazadeh, 2021).

The primary study finding was that the HCWs' physical needs have been affected, including dry hands, breathing difficulties due to the N95 mask, uncomfortableness using the PPE, heat and less fluid intake. Although the use of PPE and COVID-19 updates education and training were efficiently provided, the use of PPE cannot be avoided during the pandemic; on the contrary, it is considered essential even if it is linked to several physical discomforts (Bansal, Saji, Mathur, Rahul, & Tewari, 2021). It's significant to mention that the HCWs reported skin injuries over the nasal bridge, tightness and desquamation even if it was not from top-ranked items; but this was evident in a study conducted in a tertiary hospital in Bahrain where nurses reported stage 1 device-related facial pressure injuries resulted from tight and prolonged use of N95 masks that requires mitigations, and these injuries can be prevented with proper materials and education without compromising the mask's seal (Smart, Opinion, Darwich, Elnawasany, & Kodange, 2020).

Those HCWs who received training and education related to COVID-19 had lower challenges dealing with COVID-19 patients, while the HCWs who did not receive training and education faced more challenges. Providing education and training in managing COVID-19 patients among frontline healthcare professionals increases confidence in providing care and ensures that the risk of cross-infection is minimized, including within themselves. Staff education and training are complementary to pandemic preparedness (Tsiouris *et al.*, 2022).

Bahraini HCWs perceived more challenges as they live with their families and extended families, where some responsibilities are also expected from them at home. This can be interpreted because of the difficulty in balancing HCWs' time for family and their fear of transmitting the virus to family members (Hall, 2020).

Another major finding is the operational needs that include distributed communication with family and working environment staff, prolonged working hours, the stress of duty preparation, a limited number of isolation rooms for COVID-19 patients, and other daily challenges as well as the prolonged use of protective equipment is well presented in many other studies discussing the duty operational resources issues (Kliger *et al.*, 2020; Xie *et al.*, 2020).

The most experienced symptoms amongst HCWs were fever (23%), cough (34.9%), headache (48.8%), fatigue (35.9%) and weakness (70%), which are consistent with a previously published review (Shaukat *et al.*, 2020).

This study is the first conducted in Bahrain addressing the physical, educational and operational needs and provided empirical data for the healthcare policymakers, however, few limitations must be considered; A bias by the respondents might be possible since this study is online and used a convenience sampling technique that motivated HCWs to participate, and those who are really in need. Also, the generalizability of findings may be limited because we did not approach other areas in which HCWs are confronted with COVID-19 patients, like home care services and primary health centers.

Implications of the study results

The National Task Team in Bahrain has created strategies to combat Coronavirus COVID-19 by organizing and preparing HCWs to serve in three main areas: quarantine areas, testing centers and patient care areas (*National Taskforce for combating Coronavirus COVID-19 holds Press Conference, 2020*). This study result helped identify the HCWs' physical, educational and operational needs in multicenter Bahrain. Therefore, it provided adequate data for HCWs and their respective organization to aid in planning health services cost-effectively while maintaining a safe environment for patients and HCWs.

Recommendation

The study reveals that the frontline HCWs face physical, educational and operational needs. This study was a multiple-center study. Therefore, HCWs need to be prepared for the pandemic by planning regular national training and education session throughout the year to ensure efficiency and reduce stress when it happens. Additionally, a national multi-hospital planned disaster training is recommended to deal with pandemic situations. As most HCWs were female with family obligations considering fewer working hours and equal gender distribution will give more balance to the family and reduce the stress and challenges for HCWs. In addition to that, organizations should share their experience and challenges faced during the pandemic; for example, nurses who are assigned to an isolation unit or are handling suspected or diagnosed COVID-19 patients were mostly given separate housing accommodations and are not encouraged to be with their family members due to risk of cross-infection. This has resulted in their limited time communicating with their families, so later, they might be compensated. Due to the demands of staffing to handle the rising number of COVID-19 patients, staff were asked to work 12-hour shifts from the usual 8-hour shifts. Before and after taking COVID-19 patients, physical preparation became an additional stress for nurses as they have to ensure they are fully covered with PPE. This includes their post-shift preparation, where they must shower before heading to their designated accommodation.

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