Hospital Preparedness as Perceived by Health Care Providers during the COVID-19 Pandemic

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Abstract

Background: The world has recently seen many infectious respiratory viruses; however, the end of 2019 saw the emergence of the severe acute respiratory coronavirus 2 (SARS-CoV-2), which sparked a global pandemic and severely disrupted social, economic, and healthcare systems throughout the world. It is vital to concentrate on hospital and staff preparation because of the critical role that hospital preparedness plays. Healthcare providers help to identify potential risks and work with teams to reduce and prevent these risks via the creation of strategies and plans. **This study aims:** to assess hospital preparedness as perceived by healthcare providers during the COVID-19 pandemic. **Research design:** A descriptive design was used to conduct this study. **Settings**: This study was conducted in two hospitals: Damanhur Fever Hospital and Damanhur Chest Hospital which are affiliated to the Ministry of Health and Population at Al Behera Governorate. **Subjects**: a convenience sample of 315 who are willing to participate in the time of data collection. **Tools**: A hospital preparedness survey was used in this study to collect the data to assess hospitals in terms of preparedness as perceived by healthcare providers during the COVID-19 pandemic. **Results**: The findings of the current study revealed that healthcare providers had a moderate perception degree about hospital preparedness. **Recommendations:** initiating realistic policies, rules, and regulations to prepare hospitals to deal with any pandemic diseases and actions to eliminate them from the workplace by developing education and training; expanding occupational health for a healthy work environment.

Keywords: Hospital preparedness, COVID-19, Healthcare providers, Pandemic.

INTRODUCTION

The global health crisis in recent years has been the COVID-19 epidemic. The newest member of the coronavirus family, COVID-19, was declared a health emergency that might cause severe acute respiratory distress syndrome, pneumonia, and respiratory failure in humans (Zhou, 2020). A pandemic occurs when a disease spreads widely throughout the world, posing a threat to public health and frequently leading to high mortality rates and socioeconomic disruption (W.H.O., 2020).

On December 12, 2019, in Wuhan, China, authorities reported that the first infected patient had symptoms of fever, dry cough, fatigue, myalgia, and severe dyspnoea (Rajkumar, 2020). Aerosols, contact, and respiratory droplets are the three ways of transmission occurs. In 2020, Cucininotta and Vanelli reported that the World Health Organization (WHO) declared COVID-19 to be a pandemic on March 12th. Since healthcare providers are on the front lines of the COVID-19 outbreak, they are more likely to be exposed to biohazards and become infected with the COVID-19 pathogen (Abbasi, 2020).

Due to their increased likelihood of having prolonged close contact with COVID-19 patients, physicians, nurses, and other healthcare providers who work in critical care, emergency medicine, infectious diseases, and medical departments are more susceptible to catching COVID-19 (Munoz-Price, 2019).

To isolate confirmed COVID-19-positive patients, more intensive care units and beds had to be added every day during the height of the first wave of COVID-19 in mid-April 2020 (Rose, 2021). Healthcare providers may experience stress, physical and mental exhaustion, and irritability as a result of these factors (Shigemura, 2020). Healthcare providers,

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equipment, and bed capacity in hospitals are expected to face ongoing challenges due to the significant increase in cases, as predicted by Chopra et al. (2020).

It is vital to concentrate on hospital and staff preparation because of the critical role that hospital preparedness plays, particularly in reaction to outbreaks (Dunlop, 2020). Maintaining health services and preventing the spread of COVID-19 depend heavily on hospitals' preparedness. It involves the prevention, containment, management, monitoring, and identification of persons with COVID-19 or those exposed to it by implementing facility protocol (Centers for Disease Control and Prevention, 2020).

Healthcare providers play a significant role in crisis control and in minimizing the impact of a crisis on society, and this significance extends through all phases of a crisis. Healthcare providers help to identify potential risks and work with teams to reduce and prevent these risks via the creation of strategies and plans (Al Harthi1, 2021).

Hospital preparedness measures include educating healthcare providers (HCPs) about infection prevention and control policies, quickly identifying and isolating patients who are confirmed or suspected to have COVID-19, placing patients in appropriate isolation rooms, using personal protective equipment (PPE) appropriately to prevent transmission, moving patients who have confirmed or suspected COVID-19 within the facility, practicing hand hygiene, maintaining a clean environment, and limiting visitor access (Griffin, 2020).

Therefore, the purpose of this study is to assess hospital preparedness as perceived by healthcare providers during the COVID-19 pandemic. It is hoped that such a study will give healthcare care administrators and operational managers an insight into the future preparation of hospitals to be able to face the pandemic, identify healthcare providers' needs for future training and competencies in dealing with such situations, have shared guidance on infection prevention and control in hospitals.

Aim of the study:

Assess hospital preparedness as perceived by healthcare providers during the COVID-19 pandemic.

Research question:

What is the degree of hospital preparedness as perceived by healthcare providers during the COVID-19 pandemic?

MATERIALS AND METHOD

MATERIALS

Research Design:

A descriptive design was used to conduct this study.

Settings:

This study was conducted in two hospitals: Damanhur Fever Hospital and Damanhur Chest Hospital which are affiliated to the Ministry of Health and Population at Al Behera Governorate as they specialize in caring for patients with COVID-19 and are included in quarantine hospitals which means sorting and isolating the patients' movement to prevent the spread of the disease.

Subjects:

The convenience sampling technique was used to recruit n =315 healthcare providers who were willing to participate and on duty at the time of data collection. Also, they are responsible for direct and indirect care dealing with probable or definite COVID-19 patients and have no administrative responsibilities during the data collection period.

Tool:

One tool was used in this study:

Tool (1): Hospital Preparedness survey

A hospital preparedness survey was developed by Gul, and Yucesan (2021). The survey was used to assess hospitals in terms of preparedness as perceived by health care providers during the COVID-19 pandemic and concerning 99 items including ten components these are; availability of maximum patient admission capacity (n=8), infection prevention and control (n=15), case management (n=17),

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human resources and their management (n=13), continuity of essential health services and patient care (n=4), surveillance (n=9), communication (n=8), logistics and supply chain management (n =11), laboratory services (n =7), and essential support services (n =7).

The responses were measured on a 5-point Likert scale for each statement in the survey ranging from 1(Very bad) to 5(Very good). The survey was scored and computed by averaging the ratings given to statements included in the subscales of the survey. The total score ranged from (99 to 495) with a higher total score indicating a greater degree of hospital preparedness.

A socio-demographic characteristics questionnaire was developed by the researcher. It includes age, years of experience, level of education…etc.

METHOD:

An approval for conducting the study was obtained from the Research Ethical Committee (REC). After the official permission was obtained from the administrative authorities of Damanhur Chest Hospital and Damanhur Fever Hospital, the questionnaires were translated into Arabic, and tested by five experts interested in the field of study for its content validity. Cronbach's alpha coefficient was used to test the reliability of questionnaire dimensions. All dimensions of the questionnaire were shown to have acceptable levels of reliability in the hospital preparedness survey (α =0.990).A pilot study was carried out on 10% of healthcare providers (31) to assess and ensure the clarity, applicability, and feasibility of the statements and identify obstacles and problems that may be encountered during data collection, no changes occurred in the study tool. The questionnaires were submitted to the study subjects through social media as a formal What's Up application. The completion of the questionnaires for each study subject consumed approximately (20-30 minutes) and data collection review, and coding were completed over three months.

Ethical considerations

After explaining the aim of the study, informed consent was obtained from the study subjects. They have participated in the research study was voluntary, and the right to withdraw during research at any time was assured. In addition, the confidentiality of data and the anonymity of subjects were considered.

Statistical analysis:

After data were collected and coded, they were transferred into a specially designed format for computer entry. Data fed to statistical software IBM SPSS version 25. for both data analysis and presentation.

Statistical analysis tests, which included:-t-test, One-way ANOVA (F-ratio test), and Pearson correlation test.

RESULTS

Table (1): shows that, the higher mean percentage score of healthcare providers (4.44±0.79) were females. Concerning age, the higher mean score percent of healthcare providers (4.72±0.58) were 50 years old and more. Regarding working units, the higher mean score percent of healthcare providers (4.57±0.86) were working in isolation unit. In addition to academic qualification, the higher mean score percent of healthcare providers (4.43±0.83) were technical institution of health. Also, this table shows that the higher mean score percent of healthcare providers, (4.44±0.79) were more than 10 years of experiences.

Table (2): shows that, more than two thirds of healthcare providers (61.27%) had moderate degree of hospital preparedness and the rest (38.73%) of them had high degree of hospital preparedness. Concerning the underlying dimensions, it was found that the highest percentage of the healthcare providers (70.16%) perceived was availability of maximum patient admission capacity, followed by human resources and their management dimension (66.98%) as well as surveillance dimension (66.67%). The communication dimension was perceived in the case of a low percentage of hospital preparedness (39.68%) (Figure 1).

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Table (3): shows that there was no significant difference between health care providers in relation to hospital preparedness were p value (0.418) respectively. Concerning the underlying dimensions, this table illustrates the dimensions with higher mean score percent of total hospital preparedness (4.45±0.80-4.45±0.71) was in nurses and physicians. Also, shows that the highest mean score of hospital preparedness was infection prevention and control among all healthcare providers (6.97±1.07- 6.93±0.91-6.80±1.04 respectively).While they got the lowest mean score in essential support services (3.42±0.77-3.28±0.82) among physicians and medical technicians. Also, shows that infection prevention and control ranked the first among all healthcare providers compared to essential support services ranked tenth among physicians and medical technicians.

Table (4): shows that there was no significant difference between chest and fever hospitals in relation to hospital preparedness were p value (0.924). Also, illustrates the dimensions with the highest mean score percent of hospital preparedness (4.43±0.77) was in fever hospitals and the dimensions of hospital preparedness with the highest mean score percent (6.95±1.05) was infection prevention and control followed by (6.83±0.83) case management in fever hospital. On the other hand, the lowest mean score percent (3.42±0.82) was essential support services in fever hospital.

Discussion:

Hospital and staff preparedness should receive a lot of attention because of the critical role that hospital preparedness plays, particularly during outbreaks. Considering the state of hospitals in light of the COVID-19 pandemic as of late (Dunlop, 2020). During all stages of a crisis, healthcare providers are crucial to maintaining crisis management and reducing the negative effects on society. Health care providers assist in the creation of crisis policies and guidelines related to crisis (Al Thobaity, 2019), as well as providing education and training as a part of preparedness activities (Loke, 2021).

This study assessed hospital preparedness as perceived by healthcare providers during the COVID-19 pandemic. The finding of the current study revealed that the highest percentages of healthcare providers had a moderate level of perception regarding hospital preparedness. There was no significant difference between chest and fever hospitals. In relation to dimensions, the highest percentage of the healthcare providers was related to availability of maximum patient admission capacity, followed by human resources and their management dimension as well as surveillance dimension, while the lower percentage was regarding communication dimension.

This result could be attributed to the presence of mechanisms to implement triage, early recognition, and source control at the entrance of the hospital, supported by trained staff, applicability of the hospital strategy for admission, internal transfer, referral, and discharge of patients with severe acute respiratory infections, ability to continuously monitor vital signs, availability of oxygen and sufficient sedation for intubated patients by means of respiratory support, availability of verbal instructions, informational posters, cards, hand hygiene stations, waste bins at strategic locations across the hospital to provide health care workers, patients, and visitors' awareness, applying a one-meter distance rule between beds regardless of whether patients are suspected of havingCOVID-19, follow-up of equipment being disposable or cleaning and disinfection in case of sharing, routine cleaning and disinfection of the surfaces that the patient touches and easy access of adequate personal protective equipment (PPE) for staff and managing ability of laboratory specimens, laundry, food service utensils, and medical waste following safe routine procedures according to infection prevention and control guidelines.

Moreover, the result of the current study may be due to delay of distribution of data from the investigation about unusual occurrences to hospital healthcare providers, front-line staff, and other pertinent decision makers; surveillance training programs and the delaying of the investigation of reports of unexpected conditions by health care providers.

The results are consistent with Yfantis et al. (2020), who found that hospitals in Greece

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and Cyprus had a moderate level of preparedness to handle the COVID-19 pandemic and hospitalization requirements. Furthermore, the study conducted by Labib et al (2020) which evaluated the preparedness of special wards in Egyptian hospitals, found that the mean preparedness score was 54%, indicating a moderate level of preparedness.

Furthermore, the study conducted by Griffin (2020) and Barasa (2020) showed that hospitals were similarly well-prepared for COVID-19 as the target hospitals; the country's financial circumstances and health system differed.

This study contradicted the findings of Suleiman et al. (2020) who described healthcare workers' perceptions regarding their healthcare facilities ill-preparedness to appropriately respond to COVID-19 outbreak. Additionally, Elhadi et al (2020) indicated that healthcare professionals indicated that they were less informed and unprepared during COVID-19 pandemic. This generates worries about the capabilities of the Libyan hospitals and its medical staff to tackle the COVID-19 infection. Also, the study conducted by Dewi et al. (2021) revealed that the level of COVID-19 preparedness at three Indonesian hospitals was inadequate.

CONCLUSION

This study assessed hospital preparedness as perceived by healthcare providers during the COVID-19 pandemic. The finding of the current study revealed that the highest percentages of health care providers had a moderate level of perception regarding hospital preparedness. Also, there is no significant difference between hospital preparedness with types of health care providers and hospital settings

RECOMMENDATIONS

Provide a healthy work environment that characterized by communication through conducting a schedule for healthcare provider s' meetings and workshops with their managers to improve capacity of health providers for hospital preparedness.

Table (1): Demographic characteristics of healthcare providers

Socio-demographic data	Healthcare providers (n=315)
	Mean ± SD.
Sex	
▪ Male	4.39±0.73
▪ Female	4.44±0.79
Age	
▪ 20 - >30 years	4.36±0.82
▪ 30 - >40 years	4.45±0.72
▪ 40 - >50 years	4.46±0.80
▪ 50 years and above	4.72±0.58
Department / Unit	
▪ Emergency unit	4.54±0.81
▪ Radiology	4.44±0.69
▪ Pharmacy	4.52±0.67
▪ Critical care unit	4.36±0.85
▪ I.C.U	4.45±0.73
▪ Insolation unit	4.57±0.86
▪ Dialysis unit	4.41±0.69
▪ Laboratory	4.22±0.81
▪ Medical Device Maintenance	4.26±0.74
▪ General medical	4.25±0.78
Academic Qualification	
▪ Secondary technical nursing school diploma	4.39±0.80
▪ Technical institution of health	4.43±0.83
▪ Bachelor of science degree	4.42±0.69
Number of work experience per year	
▪ Less than 10 years	4.43±0.76
▪ 10-20years	4.44±0.79
▪ More than 20 years	4.24±0.60

Table (2): Frequency distribution of hospital preparedness level and its dimensions as perceived by healthcare providers during the COVID-19 pandemic

Hospital preparedness	Levels					
	High		Moderate		Low	
	NO.	%	NO.	%	NO.	%
Availability of maximum patient admission capacity	94	29.84%	221	70.16%	0	0.0%
Infection prevention and control	148	46.98%	158	50.16%	9	2.86%
Case management	157	49.84%	133	42.22%	25	7.94%
Human resources and their management	104	33.02%	211	66.98%	0	0.0%
Continuity of essential health services and patient care	148	46.98%	158	50.16%	9	2.86%
Surveillance	96	30.48%	210	66.67%	9	2.86%
Communication	139	44.13%	125	39.68%	51	16.19%
Logistics and supply chain management	105	33.33%	176	55.87%	34	10.79%
Laboratory services	131	41.59%	150	47.62%	34	10.79%
Essential support services	104	33.02%	177	56.19%	34	10.79%
Total of hospital preparedness	122	38.73%	193	61.27%	0	0.0%

Low (125 – 291.67)

Moderate (291.68 – 458.33)

High (458.34 – 625)

Table (3): Comparison between mean and standard deviation of hospital preparedness and its dimensions as perceived by healthcare providers during the COVID-19 pandemic

Variables	Healthcare providers (n =315)						Test of significance	
Hospital preparedness	Nurses	Rank	Physicians	Rank	Medical technician	Rank		
	$\overline{X}\pm S.D$		$\overline{X}\pm S.D$		$\overline{X}\pm S.D$		F	P-value
Availability of maximum patient admission capacity	6.86±0.85	2	6.84±0.68	2	6.75±0.80	2	0.470	0.626
Infection prevention and control	6.97±1.07	1	6.93±0.91	1	6.80±1.04	1	0.678	0.509
Case management	4.31±0.85	3	4.29±0.79	3	4.15±0.81	3	0.953	0.387
Human resources and their management	3.41±0.82	10	3.42±0.78	10	3.29±0.77	8	0.588	0.556
Continuity of essential health services and patient care	3.51±0.81	6	3.61±0.79	5	3.43±0.75	5	0.982	0.376
Surveillance	3.53±0.77	5	3.55±0.71	7	3.37±0.73	7	1.341	0.263

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Communication	**3.48±0.93**	**7**	**3.55±0.87**	**6**	**3.28±0.90**	**9**	**1.772**	**0.172**
Logistics and supply chain management	**3.78±0.88**	**4**	**3.79±0.82**	**4**	**3.68±0.81**	**4**	**0.442**	**0.643**
Laboratory services	**3.48±0.74**	**8**	**3.43±067**	**8**	**3.41±0.70**	**6**	**0.294**	**0.745**
Essential support services	**3.43±0.85**	**9**	**3.42±0.77**	**10**	**3.28±0.82**	**10**	**0.916**	**0.401**
Total	**4.45±0.80**		**4.45±0.71**		**4.31±0.75**		**0.874**	**0.418**

Table (4): Comparison between mean and standard deviation of hospital preparedness and its dimensions according to the hospitals' settings

Hospital preparedness	**Chest hospital**	**Fever hospital**	**Test of significance**	
	X̄±S.D	**X̄±S.D**	**t-test**	**P-value**
Availability of maximum patient admission capacity	**6.83±0.76**	**6.83±0.83**	**0.047**	**0.962**
Infection prevention and control	**6.90±1.03**	**6.95±1.05**	**0.444**	**0.658**
Case management	**4.27±0.82**	**4.27±0.84**	**0.065**	**0.948**
Human resources and their management	**3.39±.80**	**3.39±080**	**0.002**	**0.998**
Continuity of essential health services and patient care	**3.56±0.79**	**3.48±0.80**	**0.927**	**0.355**
Surveillance	**3.51±0.76**	**3.50±0.74**	**0.115**	**0.908**
Communication	**3.46±0.93**	**3.45±0.90**	**0.110**	**0.912**
Logistics and supply chain management	**3.77±0.86**	**3.76±0.84**	**0.134**	**0.893**
Laboratory services	**3.41±0.72**	**3.49±0.69**	**0.953**	**0.341**
Essential support services	**3.37±0.82**	**3.42±0.82**	**0.468**	**0.640**
Total	**4.42±0.76**	**4.43±0.77**	**0.095**	**0.924**
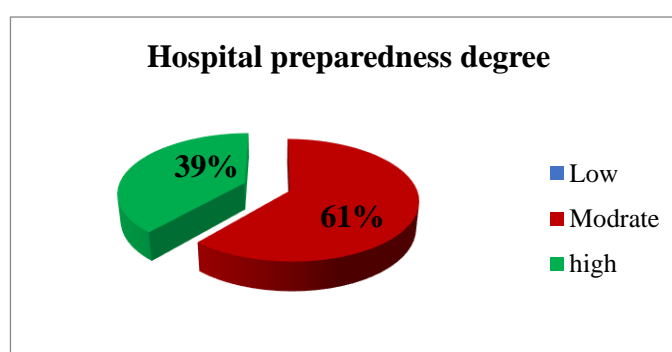
Figure 1 Hospital preparedness degree among study participants (n=315).

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