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Research Article

**AN ASSESSMENT OF THE CAPABILITIES OF THE HEALTH CARE SYSTEM AT THE KINGDOM OF SAUDI ARABIA IN FACING THE CORONAVIRUS (COVID-19) PANDEMIC, FROM THE HEALTH CARE WORKERS PERSPECTIVE IN THE NAJHRAN REGION OF SAUDI ARABIA.****Mohammed dafer<sup>1\*</sup>, Ebrahim nasser<sup>1</sup>, Saleh nasser<sup>1</sup>, Saeed misfer<sup>1</sup>, Misfer dafer<sup>1</sup>, and Mohammed nasser<sup>1</sup>**<sup>1</sup>King Abdullah International Medical Research Center (KAIMRC), Najran, Kingdom of Saudi Arabia**Article Received:** November 2022    **Accepted:** November 2022    **Published:** December 2022**Abstract:**

*The current study aims to assess the capabilities of the health care system in the Kingdom of Saudi Arabia in facing the Coronavirus (COVID-19) from the point of view of health sector workers inside the Najran region, as the repercussions of the Corona pandemic imposed many challenges for health systems and the extent of their preparedness to face the pandemic. This will be through addressing the knowledge of the health system in the Kingdom of Saudi Arabia, especially in the Najran region, in terms of the availability of medical personnel, equipment and methods of personal protection. The current study sample consisted of (71) health workers in the Najran region, and to achieve the objectives of the study, the researcher designed an electronic questionnaire that assesses the capabilities of the health care system in the Kingdom of Saudi Arabia in facing the Corona virus COVID-19, from the viewpoint of health sector workers inside the Najran region. The results indicated that 83.43% of the extent of the preparedness and capacity of the health care system in the Kingdom of Saudi Arabia in facing the covid-19 virus. In addition, that the average answers of the study sample on the capabilities of the health system in the Kingdom amounted to (80-92%). The researcher explains this as: Effective implementation of the Saudi Vision 2030 launched by the Saudi government, which seeks to raise the level of health in the Kingdom and improve the quality of services. The study recommended a set of recommendations, the most important of which are: The necessity of reviewing and developing preventive strategies, procedures and measures taken by the Kingdom of Saudi Arabia.*

*Keywords: Health-care worker, covid -19, emerging infectious diseases, Saudi Arabia*

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## 1. INTRODUCTION

The World Health Organization (WHO) has announced that the new Coronavirus disease (COVID-19) that started an epidemic for the first time in China, Wuhan, in December 2019, has become an epidemic threatening the lives of millions of people. As the number of Coronavirus infections increased worldwide during the first week of March 2020, and the World Health Organization declared the outbreak of COVID-19 a “pandemic” on 11 March 2020 [1]. Globally, the number of confirmed cases of Covid-19 since its spread has reached more than 171 million cases and more than 3.5 million deaths [2].

The COVID-19 pandemic has posed enormous challenges to all healthcare systems around the world. It has also become a global public health threat to all health care systems [3]. The Ministry of Health (MOH) announced the first case reported in the Kingdom of Saudi Arabia in 2 March 2020 (The Ministry of Health, 2020). In addition, within one month of registering the first case of COVID-19 disease, the numbers infected with the viral disease doubled, which poses a serious challenge to health care professionals. The kingdom of Saudi Arabia started an immediate action involving all the government agencies involved against the COVID-19 outbreak by taking unprecedented precautionary measures, such as using widespread quarantine, monitoring and closing airports and borders, and extensive infection control training for healthcare professionals [4].

To cope with COVID-19 in any health-care setting and to avoid infection to the maximum degree possible, infection management strategies based on the best available evidence are required. Previous research has suggested that health-care staff can lack the necessary attitude and information about SARS and Middle East respiratory syndrome [5]. A Haridi, et al revealed several precautionary measures taken by hospitals in the Najran region in the Kingdom of Saudi Arabia to confront the Corona virus epidemic, such as conducting training programs on combating the epidemic, providing N95 face masks, and providing all personal protective equipment available and always available in the workplace [6].

The COVID-19 pandemic has placed the world in a difficult challenge for both governments and health systems, and it requires them to respond quickly to be able to stop the spread of the virus. Many health systems in countries of the world, including the Kingdom of Saudi Arabia, have dealt with the pandemic, focusing the health response on hospital

services, increasing the number of beds, and ventilators, especially in intensive care units, in addition to paying attention to the appropriate regulation of specialized care for severe cases of COVID 19 [7]. This research focused on evaluating the capabilities of the health care system in the Kingdom of Saudi Arabia in facing the Covid-19 pandemic to reduce the risks resulting from this pandemic.

The aim of this paper is to assess the capabilities of the health care system in the Kingdom of Saudi Arabia in the face of COVID-19, from the point of view of workers in the health sector in the Najran region of Saudi Arabia.

## 2. MATERIALS AND METHODS:

### 2.1. Study design and setting

This is a cross-sectional study of HCWs working at the government hospitals of the Saudi Ministry of National Najran Health Affairs (MNN-HA). All facilities have been Joint Commission International (JCI) accredited since 2006. The data collection was conducted from November, to December 2022. The target population were the HCWs working at the government hospitals in Najran city. Data collection was carried out using questionnaire. The questionnaire was initially prepared in English and then was translated into Arabic (the local language) and later on back to English to check for consistency.

Ethical approval obtained from the Ethics Committee of the Directorate of Health in Najran. The study's goals and benefits described to the participants, and the importance of participant confidentiality and privacy explained.

### 2.2. Study participants

The MNN-HA employs a large number of HCWs of various disciplines and nationalities (~ 8300 HCWs). MNG-HA HCWs were invited to participate in this study. Participants included all HCWs in government hospitals in Najran, Saudi Arabia. Convenience sampling used. A significance level of 0.05, 95% CI and power of 80% were used. Based on this sample size calculation, including 10% nonresponse rate the total sample is (121).

### 2.3. Study instruments

The questionnaire included questions regarding the establishment of an operation plan to cope with a pandemic in hospitals before that of SARS-COV-2, was designed on the basis of a survey previously used in studies of the concerns of HCWs with regard to

severe acute respiratory syndrome (SARS). the conduction of drills to treat cases in the event of a pandemic and to train the personnel on the use of PPE and patient care. More specifically, regarding the pandemic of SARS-COV-2. The participants were asked on the sufficiency of PPE and antiseptics and whether they had been trained to use them properly. Also asked whether they had been trained to ventilate, intubate and defibrillate patients, after the SARSCOV-2 pandemic broke out. The questionnaire included questions regarding the safety of the provided healthcare services in relation to the quality and quantity of the HCWs. The questionnaire was provided with a cover letter explaining the purpose of the study, the method of response, the aim of the research, and data security in order to encourage a high response. The questionnaire was provided with a

covering letter clarifying the purpose of the study, the way of responding, the aim of the research and the security of the data in order to encourage a high response.

#### 2.4. Statistical methods

Data entry and analysis were done using the Statistical Package for Social Sciences version 22 (SPSS Inc., Chicago, IL). Arithmetic means and standard deviations were applied to describe continuous data, whereas frequency and percentages were applied for categorical data. Chi-squared tests were utilized to assess the associations between categorical data and unpaired t-test to test for the significant difference between two continuous variables. A p-value of less than 0.05 was considered for statistical significance.

### 3. RESULTS:

#### 3.1. Socio-demographics of the participants

**Table 1.Sociodemographic traits of participants (n=71)**

	Variable	n	%
<b>Your gender</b>	male	55	77.5
	Female	16	22.5
<b>Your age</b>	≤ 30 years	36	50.7
	31-40 years	28	39.4
	41 50 years	6	8.5
	≥ 51 years	1	1.4
<b>Highest qualification achieved</b>	High School	17	23.9
	Diploma	23	32.4
	BA	27	38.0
	MS/PHD	4	5.6
<b>Years of experience</b>	≤ 5 years	26	36.6
	6 - 10 years	14	19.7
	10 – 15 years	19	26.8
	≥ 16 years	12	16.9
<b>Type of health care personnel:</b>	Medical doctor	18	25.4
	Physician assistant	2	2.8
	Registered nurse	13	18.3
	Assistant nurse	3	4.2
	Radiology /X-ray technician	2	2.8
	Phlebotomist	5	7.0
	Ophthalmologist		0.0
	Physical therapist	1	1.4
Respiratory therapist	3	4.2	

Nutritionist/dietitian	1	1.4
Midwife	4	5.6
Pharmacist	5	7.0
Pharmacy technician or dispenser	2	2.8
Laboratory personnel	2	2.8
other	10	14.1

A total of (71) MNN-HA HCWs (55 male and 16female) in the Najran region agreed to participate in the study and filled out questionnaires assessing the capabilities of the health care system in Najran at the Kingdom of Saudi Arabia in the face of COVID-19. Approximately a half (50.7%) of the participants

were aged  $\leq 30$  years, and the majority (36.6%) were  $\leq 5$  years' experience. This included 18 (25.4%), Medical doctors, 13 (18.3%) Registered nurse and 30 (42.3%) other healthcare workers, including health inspectors, pharmacists, lab technicians and radiology technicians, Table (1).

### 3.2. *The capabilities of the health care system in the Najran region of the Kingdom of Saudi Arabia in confronting the COVID -19?*

**Table 2. The capabilities of the health care system in confronting the COVID -19**

no	Questions	Mean	Std. Dev	RII (%)	Rank
1	the healthcare system in Saudi Arabia is capable of dealing with the COVID-19 pandemic	4.58	0.5302	91.67	1
2	The healthcare facilities in Saudi Arabia, especially in your workplace Ready and able to handle the COVID-19 pandemic	4.41	0.5907	88.33	3
3	The healthcare facilities in Saudi Arabia were funded appropriately				
3.1	Permanent power supply	4.31	0.8334	86.33	5
3.2	Preventive plans to deal with the pandemic	4.37	0.6763	86.33	4
3.3	Personal protective equipment	4.23	0.8900	84.67	6
3.4	Private isolation rooms	4.10	0.9691	82.00	11
3.5	Diagnostic laboratories	4.07	0.9892	81.33	13
3.6	Intensive care rooms and beds	4.05	0.9816	81.00	14
4	Healthcare workers are trained in how to implement isolation procedures.	4.23	0.7449	84.67	6
5	Health care workers receive proper training on how to deal with COVID-19.	4.18	0.7477	83.67	8
6	Health care workers receive adequate financial support	3.51	1.3210	70.33	16
7	Health care fund receives adequate financial support from the local health authorities.	3.97	0.9737	79.33	15
8	The health care center receives adequate instructions from the local health authorities about the precautionary measures.	4.17	0.7403	83.33	10

9	There is a limit to the number of visitors in hospitals.	4.08	1.1390	81.67	12
10	The hospital administration take into account the presence of sufficient distance between people "social distancing"	4.48	0.6507	89.67	2
11	Hospitals have awareness guidelines, masks and sterilizers in hospital departments	4.18	0.8924	83.67	8
<b>All statements</b>		4.461333	0.91134	89.20	

The capabilities of the health care system in the Kingdom of Saudi Arabia in confronting the COVID-19. Regarding the whole paragraphs, the RII equals (89.2%). This means that the Kingdom of Saudi Arabia has capabilities in confronting the COVID-19.

Table (2) showed that the Paragraph "the healthcare system in Saudi Arabia is capable of dealing with the COVID-19 pandemic" was ranked in the first

position by the respondents under this group with relative importance index equals (91.67%). This means that the healthcare system in the Najran region is capable of dealing with the COVID-19 pandemic. However, the Paragraph "Health care workers receive adequate financial support" ranked in the last position by the respondents under this group, with relative importance index equals (70.33%).

### 3.3. Compliance with information on infection control procedures

**Table 3. Compliance with information on infection control procedures**

Questions	Always N (%)	Most of the time N (%)	Rarely N (%)
Do you follow recommended hand hygiene practices?	46 (64.8)	20 (28.2)	5 (7.0)
Do you use a hydro-alcoholic solution or soap and water before touching the patient?	48 (67.6)	16 (22.5)	7 (9.9)
Do you use a hydro-alcoholic solution or soap and water before any cleaning or sanitizing procedures?	49 (69.0)	14 (19.7)	8 (11.3)
Do you use a hydro-alcoholic solution or soapy water after exposure to (or at risk) exposure to body fluids?	49 (69.0)	15 (21.1)	7 (9.9)
Do you follow infection control precautions guidelines when contacting with any patient?	51 (71.8)	15 (21.1)	5 (7.0)

The results in Table (3) show that (64.8%) of the sample follow recommended hand hygiene practices. (67.6%) of the sample use a hydro-alcoholic solution or soap and water before touching the patient. (69.0%) of the sample use a hydro-alcoholic solution or soap and water before any cleaning or sanitizing procedures, and use a hydro-alcoholic solution or soapy water after exposure to (or at risk) exposure to body fluids, while the (71.8%) follow infection control precautions guidelines when contacting with

any patient. The researcher attributed the high rate of adherence to the preventive use used against Covid - 19, to the awareness of HCWs in government hospitals in the Najran region about the importance of adhering to the various means of prevention. As it indicates the keenness of the Saudi Ministry of Health and hospitals in the Najran region to provide all means of prevention and protection for hospital HCWs during the Covid -19 pandemic.

3.4. *Exposure to a patient infected with the COVID-19*

Table 4. Exposure to a patient infected with the COVID-19

Report type	Correct Responses	
	F	%
<b>Did you have face-to-face contact (within 1 meter) with a confirmed COVID-19 patient in a health care facility?</b>		
yes	27	38.0
no	44	62.0
<b>If yes, for how long each time</b>		
<15 minutes	26	36.6
5-15 minutes	20	28.2
> 15 minutes	25	35.2
<b>If yes, were you wearing personal protective equipment</b>		
yes	54	76.1
no	17	23.9
<b>If yes, what kind of personal protective equipment you wore it? Check all that apply</b>		
Medical / Surgical Mask	18	25.4
Respiratory protective mask (eg, FFP2, N95 or equivalent masks)	9	12.7
face shield	3	4.2
protective gloves	7	9.9
Goggles or goggles	4	5.6
dress	3	4.2
hooded coats	2	2.8
horns	25	35.2
<b>Have you had direct contact with the surfaces surrounding the patient</b>		
Always	31	43.7
Most of the time	33	46.5
Rarely	7	9.9
<b>which surfaces</b>		
Bed	14	19.7
Bathroom corridors service patient table	7	9.9
Bedside table	5	7.0
Meal table for medical gases art signs	3	4.2
Other	25	35.2

The results in Table (4) show the main risks associated with dealing with a patient infected with Covid-19. The results showed that a large percentage of workers in hospitals in the Najran region in the Kingdom of Saudi Arabia took all preventive

measures while dealing with patients. This calls for those in charge of the Saudi Ministry of Health to pay attention to providing preventive tools to maintain the safety of employees, ensure business continuity, and provide services to patients.

3.5. *Information about the health facility***Table 5. Information about the health facility**

Information about the health facility	Always N (%)	Most of the time N (%)	Rarely N (%)	Rank
Does the health facility have infection control guidelines for health workers?	56 (78.9)	9(12.7)	6 (8.5)	1
Does the health care facility have infection control guidelines for standard and additional precautions (transmission)?	52 (73.2)	9 (12.7)	10 (14.1)	6
Does the health facility organize regular infection control training for health workers (at least once a year)?	46 (64.8)	10 (14.1)	15 (21.1)	10
Does the health facility have personal protective equipment?	52 (73.2)	9 (12.7)	10 (14.1)	6
Is personal protective equipment available in sufficient quantities at the health facility?	47 (66.2)	13 (18.3)	11 (15.5)	9
Is the available PPE of good quality and appropriate to the needs?	50 (70.4)	9 (12.7)	12 (16.9)	8
Are hydro-alcoholic solutions readily available (ie available at the point of care) for hand hygiene in the health facility?	54 (76.1)	11 (15.5)	6 (8.5)	3
Is soap and water available for hand hygiene in the health facility?	54 (76.1)	7 (9.9)	11 (15.5)	3
Does the health facility conduct regular audits (at least once a year) to assess hand hygiene and provide regular feedback to health workers?	41 (57.7)	14 (19.7)	16 (22.5)	12
Does the health care facility conduct other infection control audits?	42 (59.2)	12 (16.9)	17 (23.9)	12
Does the health facility check staff on arrival for symptoms of infection?	46 (64.8)	12 (16.9)	13 (18.3)	10
Does the health facility management notify all health workers if a patient infected with COVID-19 is cared for in the health facility?	55 (77.5)	11 (15.5)	5 (7.00)	2
Does the health facility have a well-equipped entrance triage station with trained staff?	53 (74.6)	9 (12.7)	9 (12.7)	5
Are patients suspected of having COVID-19 isolated upon arrival at the health facility?	56 (78.9)	9(12.7)	6 (8.5)	1

The results in Table (5) show that (78.9 %) of the sample reported patients suspected of having COVID-19 isolated upon arrival at the health facility. (77.5%) of the sample reported health facility management notify all health workers if a patient infected with COVID-19 cared for in the health facility. (57.7 %) of the sample reported the health facility conduct regular audits (at least once a year) to assess hand hygiene and provide regular feedback to health workers, and the health care facility conduct other infection control audits. The researcher attributed the high rate of adherence to the preventive measures used by health facilities in the Najran region in the Kingdom of Saudi Arabia. to the

availability of a plan to deal with disasters, in addition to the interest of the Ministry of Health to raise the health level of the Saudi society, within what came in the vision of the Kingdom of Saudi Arabia 2030.

**4. CONCLUSIONS:**

Dealing with disasters and infectious diseases in hospitals requires the control and management of detected cases using transmission-based precautions for all confirmed and probable cases. For COVID-19 in hospitals in the Najran region, Saudi Arabia, early identification, testing, and precautions are required [8]. In this study, we found that despite a high

baseline level of awareness about COVID-19 and the importance of infection control, significant misconceptions persist. As the study indicates a high incidence of respiratory diseases among health care workers during their work in hospitals [9]. In addition, Kim, T.H suggested that, infected health care workers were an important group involved in disease spread [10].

The current study also indicates that half of the HCWs in the Najran region in the Kingdom of Saudi Arabia, whose contact with cases infected with Covid-19 were investigated for the possibility of infection, which increases the level of concern about the transmission of infection and the possibility of its impact on the quality of health services. The results of this study also show a significant proportion of personal experience of contracting COVID-19 either as health care dependents in case-caring institutions or being investigated for possible post-contact infection [10].

A survey of HCWs in Oyo State, South-Western Nigeria found a government-related and self-satisfaction related concerns were expressed by the majority of the Primary Health Care (PHC) workers, which was implicated in the rapid spread of the infection in hospitals [11].

The majority of respondents indicated that hospital overcrowding, poor hand hygiene and use of masks, lack of knowledge about mode of transmission, lack of policies and procedures, and inadequate training in infection control procedures also contributed to the risk of transmission. Self-reported adherence to infection control measures was surprisingly weak, particularly in light of previous studies indicating that self-reported adherence generally overestimates observed behavior.

These findings can provide a reference point for monitoring HCWs perceptions in the event of future infectious disease outbreaks in Saudi Arabia. The majority of respondents in this study were concerned about their risk of contracting COVID-19. This level of concern can have a negative impact on the management of suspected or confirmed cases of MERS, and on the overall effectiveness of HCWs during an outbreak. The level of anxiety was high in hospital workers, in the Najran region of Saudi Arabia, who had previously experienced disease control procedures. Compliance with WHO recommendations is essential to ensure adequate support for frontline HCWs. Measures must be taken to protect them through infection control measures, personal protective practices and antiviral medication [2]. All of these control measures could be crucial to

maintaining the integrity of the health-care system during an outbreak.

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### Conflict of Interest

All authors declare no conflicts of interest in this paper.

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