

Exploring Primary Healthcare Nurses' Preparedness and Response toward COVID-19 Pandemic in Makkah, Saudi Arabia: A Cross-sectional Study

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ABSTRACT

Background and aim: Nurses' responsibilities during this epidemic have broadened beyond simply caring for the ill to assisting them in their recovery. The main purpose of this study was to assess the primary healthcare nurses' preparedness and response to COVID-19 pandemic in primary healthcare centers in Makkah-Saudi Arabia. **Materials & Methods:** A quantitative cross-sectional design was conducted at primary healthcare centers in Makkah. The population of the current study consisted of nurses who are working in primary healthcare in Makkah during the period of COVID-19. The total number of study sample is 132. Self-administered questionnaire was used to collect data from the participants adopted from Al Baalharith & Pappiya (2021). **Results:** The majority (92.4%) of participants have high knowledge, 4.5% of them have average knowledge, while 3.0% of them have weak knowledge. Moreover, the majority (93.9%) of nurses stated that health care workers explain the reason for triage/screening to patients and 92.4% of them stated that there was a designated screening area to check the temperature. Factors associated with nurses' preparedness toward COVID-19 pandemic involve nurses' knowledge of preparedness and nurses' knowledge of preparedness and response. **Conclusion:** The nurses who participated in the study had a high level of awareness of pandemic preparedness and response. The level of readiness and preparation shown by nurses with regard to personal protective equipment is insufficient. Age, years of experience, and the setting in which nurses operate are all factors that influence their level of readiness knowledge.

Keywords: Primary Healthcare Nurses, Preparedness, Response, COVID -19.

INTRODUCTION

COVID-19 pandemic is the most visible epidemic in the world (World health organization [WHO], 2020). Over the past two decades, it has emerged as a serious public health issue

(Gentile & Abenavoli, 2020). The COVID-19 pandemic has been linked to 373,591,280 cases and 5,677,545 fatalities worldwide. On March 2, 2020, the Saudi Arabian Ministry of Health announced the country's first confirmed case. In the city of Qatif, there was a rumor going around about a Saudi Arabian citizen who had traveled to Bahrain from Iran. On March 4, 2020, it was reported that a second case had been confirmed, and that it was linked to the initial case in some way (MOH, 2020).

There are 683,053 people living in Saudi Arabia and 8,936 people have died from COVID-19, as at 2021 (Worldmeter, 2021). For many people, primary healthcare is their initial point of access into the healthcare system. It is also the most expensive point of admission. In community settings, primary healthcare nurses are the most important frontline healthcare workers, and they are also the leaders in the response to and management of infectious illnesses, ensuring that infections are identified and prevented from spreading as early as possible (World Health Organization, 2020).

The importance of primary healthcare has risen during the critical early period of the COVID-19 pandemic, and the reaction has been diverse among different health care leaders and institutions throughout the world during this time (Rawaf et al., 2020). Furthermore, nurses' responsibilities during this epidemic have broadened beyond simply caring for the ill, to assisting them in their recovery. As a result, nurses must have the knowledge and abilities to provide a realistic strategy to reacting to this epidemic and handling severe circumstances when they encounter them (Al Baalharith, & Pappiya, 2020).

The World Health Organization (WHO) has proposed a number of additional measures to prevent a COVID-19 pandemic. These measures include the establishment of curfews, the quarantining of suspects, and the imposition of travel restrictions, the cancellation of public events, and the shutting down of facilities. (Al-Tawfiq et al., 2020).

There are no previous studies in Saudi Arabia assessing the primary healthcare nurses' preparedness and response to the COVID-19 pandemic. Thus, this study aims to bridge this gap of knowledge by adding new ideas about this issue among primary healthcare nurses. The results of this study will inform nurse managers and healthcare policy makers about the status, knowledge, and practices of healthcare nurses' preparedness and response to COVID-19 in Makkah. The main purpose of this study is to assess the primary healthcare nurses' preparedness and response to COVID-19 pandemic in primary healthcare centers in Makkah.

METHODS & MATERIALS

Research approach

The main purpose of this study is to assess the primary healthcare nurses' preparedness and response to COVID-19 pandemic in primary healthcare centers in Makkah. The researchers addressed research objectives and research questions in accordance to the study design and research approach. The current study adopted a quantitative approach. This approach involve collecting quantitative data to achieve the main purpose and specific objectives of the study.

Research Design

The design of this study was quantitative cross-sectional. This research design strategy involves the gathering of data at one moment in time, in which all phenomena under research are collected within one data collecting session (Polit & Beck, 2018).

Instrument of Data Collection

The participants answered questions on a questionnaire that they self-administered and that was adapted from Al Baalharith and Pappiya (2021). The tool involved five domains. The first aspect of the participants' lives that was analyzed was their demographic make-up. The second domain had six items that tested the nurses' level of comprehension regarding COVID-19 preparation. In the third section, there were seven questions about the evaluation of primary healthcare preparedness and response readiness utilizing approaches such as triage and screening, which are frequently utilized in the field. The fourth aspect of the research focused on the use of personal protective equipment (PPE), as well as training and safety procedures. In the fifth and final part of the series, nurses were given a test to see how well they understood personal protective equipment (PPE).

Instrument Validity and Reliability

The questionnaire will be submitted to a panel of experts with experience and knowledge of research topic who will make suggestions and judgments about the adequacy of the questionnaire. Reliability coefficient will be measured using Cronbach's coefficient alpha.

Research Setting

This study was carried out at primary healthcare centers in Makkah-Saudi Arabia. These primary health centers included four different sectors, which are (Al-Zahir sector - Al-Kaakiyeh sector - Al-Awali sector - Al-shara' sector).

Research population

The population of the current study consisted of nurses who are working in primary healthcare in Makkah during the period of COVID-19 pandemic. The total number of nurses is 650.

Sample and sampling technique

For the purpose of the study, Stephen Thompson's formula was applied to calculate the sample size [CI = 95.0%, power=0.8, confidence limit = 0.05, population= 650].

$$n = \left[\frac{N X p(1 - p)}{[N - 1X(d^2 \div z^2)] + p(1 - p)} \right] \quad (1)$$

$$\frac{650 \times 0.50(1 - 0.50)}{650 - 1 \times \left(\frac{0.0025}{3.84} \right) + 0.50(1 - 0.50)} = 242 \text{ nurses} \quad (2)$$

The researchers used a convenience sampling method to recruit study participants from primary healthcare centers.

Inclusion criteria

Male and female staff and registered nurses from the Saudi Commission for Health Specialties (SCFHS); who received COVID-19 vaccination; can read and understand English; have at least one-year of experience and who were in primary healthcare centers during the COVID-19 pandemic made up the sample frame for the current study.

Exclusion criteria

Nurses who had not received vaccination; unregistered nurses from SCFHS; those who could not read and understand English; nurse managers and supervisors; those with less than one-year of experience, as well as nurses who were not interested in participating in the current study were excluded.

Data analysis

To achieve the goal of the study, the researcher will use the statistical package for the Social Sciences (SPSS, IBM Version 24) for analyzing the data. Descriptive statistics will be used such as mean, frequency and percentage. Inferential statistics such as independent sample t test, One-Way ANOVA will be used to answer the research questions.

Ethical and administrative consideration

Ethical approval will be obtained from Institute of Research Board (IRB) at Umm Al-Qura University and the General Director for Research and Studies (GDRS) from the Ministry of Health, Makkah. Informed consent will be sent electronically through Google form and obtained from all the participants before completing the questionnaire. The study will be anonymous, an explanation for research process will be done for the participants, and there will be no personal risk from participating in this study.

The data that were collected during the study were stored in a secure file on a computer. During the research process, all computers were password protected and only authorized people were allowed access to the research data.

RESULTS

Participant demographics

The study included 132 participants. The participants in this research were nurses of different as gender, age, educational level, experience, nationality, income, work sector, and marital status.

Table 1 shows distribution of participants based on their demographic factors such as gender, age, educational level, experience, nationality, income, work sector, and marital status. The table shows that, 84.8% of participants are females, while 15.2% are males. The age of more than half (63.6%) of participants is 30 – 39 years. The age of 21.2% of them is 20 - 29 years, while the age of 15.1% of participants is more than 40 years.

Furthermore, 80.3% of participants are Saudis, while 19.7% of them are non-Saudis. The experience of 42.4% of participants is 11 to 19 years, the experience of 27.3% of them is 6 to 10 years, while 19.7% of them have experience have experience 1 to 5 years. In addition, less than half (53.0%) of participants have income more than 10,000 SAR, nearly one-third (30.3%)

of participants have income 5,000 < 10,000 SAR, while 16.7% of the have income below 5,000 SAR.

Moreover, nearly one-third (33.3%) of participants are working in Al-Zahir sector, 24.2% of them are working in Al-Awali sector, while 22.7% of them are working in Al-Kakiyyah sector. The table also shows that more than half (59.1%) of participants have bachelor's degree, while 40.9% have a post graduate diploma or higher qualification. Furthermore, more than half (57.6%) of participants are married, while 36.4% of them are single.

Table 1: participants demographic data (N= 132)

	N	%
Gender		
Female	112	84.8
Male	20	15.2
Age		
20 - 29 years	28	21.2
30 - 39 years	84	63.6
Above 40 years	20	15.1
Nationality		
Saudi	106	80.3
Non – Saudi	26	19.7
Experience		
One to 5 years	26	19.7
6 to 10 years	36	27.3
11 to 19 years	56	42.4
Above 20 years	14	10.6
Level of income		
<5,000 SAR	22	16.7
5,000 < 10,000 SAR	40	30.3
>10,000 SAR	70	53.0
Sectors work		
Al-Awali sector	32	24.2
Al-Kakiyyah sector	30	22.7
Al-Sharaya sector	26	19.7
Al-Zahir sector	44	33.3
Level of education		
Bachelor	78	59.1
Post Graduate Diploma or higher	54	40.9
Marital status		
Single/never married	48	36.4
Married	76	57.6
Divorced or Widowed	8	6.0

Table 2: shows the mean and standard deviation of nurse's knowledge on COVID-19 preparedness. The mean score of nurses' knowledge is 5.7 out of 6. Moreover, the majority (92.4%) of participants have high knowledge, 4.5% of them have average knowledge, while 3.0% of them have weak knowledge.

Table 2: Mean score and standard deviation of nurse's knowledge of COVID-19 preparedness

Knowledge		Score		
	N	%	Range	Mean $\pm$ SD
Weak	4	3.0		
Average	6	4.5		
High	122	92.4	0-6	5.712 $\pm$ 1.00
Total	132	100.0		

Table 3 and figure 1 show differences in the mean score of nurses' knowledge of preparedness and response with regard to their demographic factors. There is a significant difference in the mean score of nurses' knowledge of preparedness and response with regard to their age ($p < 0.05$). Those aged 20 - 29 years demonstrated a higher level of knowledge and preparedness than those aged 30- 39 years.

In addition, there is a significant difference in the mean score of nurses' knowledge of preparedness and response with regard to their experience ($p < 0.05$). Those with 6 - 10 years' experience demonstrated a greater level of preparedness and response, than those with 11- 19 years of experience. Furthermore, there is a significant difference in the mean score of nurses' knowledge of preparedness and response with regard to their work sector ($p < 0.05$). In Al-Awali sector are better prepared than those working in Al-Zahir.

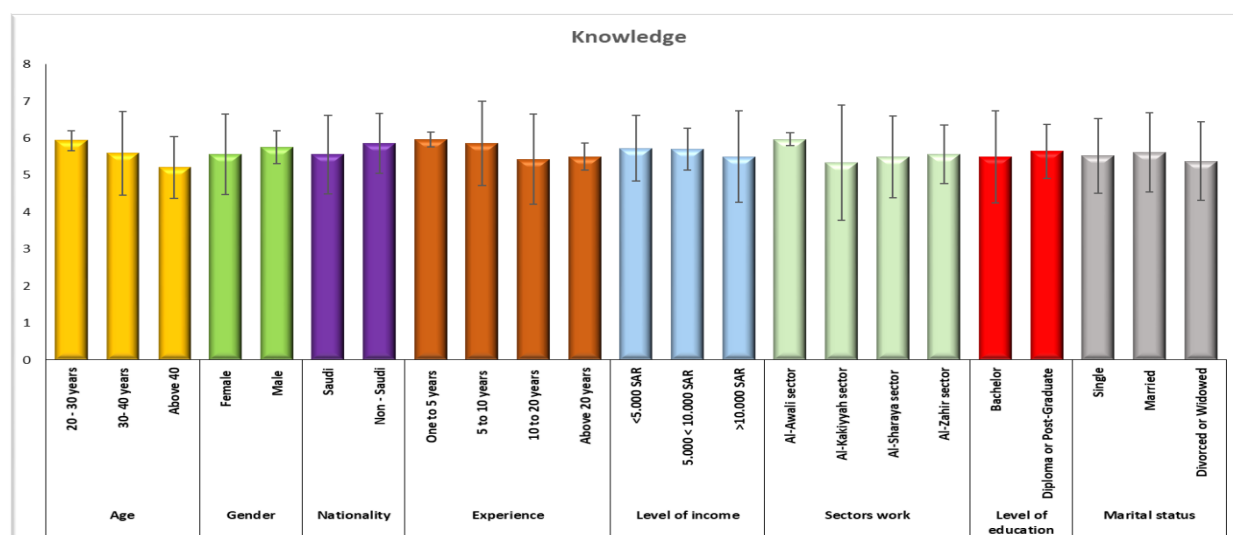


Figure (1): differences in the mean score of nurses' knowledge of preparedness and response with regard to their demographic factors

Table 3 and figure 1 Differences in the mean score of nurses' knowledge of preparedness and response with demographic factor

		N	Knowledge			ANOVA or T-test	
			Mean	±	SD	Test value	P-value
Age	20 - 29 years	28	5.929	±	0.26	3.316	0.039*
	30- 39 years	84	5.583	±	1.13		
	Above 40	20	5.200	±	0.83		
Gender	Female	112	5.571	±	1.08	-1.249	0.216
	Male	20	5.750	±	0.44		
Nationality	Saudi	106	5.557	±	1.06	1.360	0.176
	Non - Saudi	26	5.860	±	0.81		
Experience	One to 5 years	26	5.962	±	0.19	3.012	0.034*
	6 to 10 years	36	5.857	±	1.13		
	11 to 19 years	56	5.42	±	1.21		
	> 20 years	14	5.50	±	0.36		
Level of income	<5.000 SAR	22	5.72	±	0.88	0.699	0.499
	5.000 < 10.000 SAR	40	5.70	±	0.56		
	>10.000 SAR	70	5.50	±	1.23		
Sectors work	Al-Awali sector	32	5.96	±	0.17	2.447	0.048*
	Al-Kakiyyah sector	30	5.33	±	1.56		
	Al-Sharaya sector	26	5.50	±	1.10		
	Al-Zahir sector	44	5.56	±	0.78		
Level of education	Bachelor	78	5.50	±	1.24	-0.479	0.632
	Diploma / Post-Graduate	54	5.64	±	0.73		
Marital status	Single	48	5.52	±	1.01	0.580	0.561
	Married	76	5.61	±	1.07		
	Divorced or	8	5.37	±	1.06		
	Widowed						

DISCUSSION

Nurses Knowledge on COVID-19 Preparedness

This study indicated that 92.4 percent of participants had high, average, or low knowledge on COVID-19 preparedness. On the other hand, just 4.5 percent of individuals had average knowledge, and 3.0 percent of participants had weak knowledge. This indicates that the nurses have a solid understanding of the preparedness procedures for COVID-19. The degree of experience of nurses who have worked in emergency situations such as pandemics and natural disasters is quite high. It's possible that the high level of knowledge is due, in part, to the training programs that prepare people for COVID-19.

The outcomes of this study are congruent with the findings of Al Baalharith and Pappiya (2021), who came to the conclusion that the participants' general awareness of COVID readiness was good. This high level of awareness among the nursing workforce could be explained by the fact that nurses saw themselves as the first line practitioners in the treatment of patients and the prevention of COVID-19 transmissions in both hospitals and the community. The primary emphasis of the current study was on the knowledge held by Saudi Arabian nurses on the

COVID-19 readiness and reaction. The conclusions of this study have been confirmed by survey data from a recent COVID-19 survey that was carried out in the United States (US). According to the findings of this survey, around 92.4 percent of nurses have a solid understanding of how prepared they are for COVID-19.

According to Crowley et al. (2021), the findings of the most recent study, which found that 43.3 percent of participants had confidence in the infection prevention and control training they had received and that 56.7 percent felt prepared to offer direct treatment to suspected COVID-19 cases, are not comparable to the findings of the previous study. In Australia, only 71.9 percent of primary healthcare nurses were confident in their understanding of COVID-19, whereas in the United Kingdom, 52.0 percent of nurses were confident in their training on COVID-19 (Hackett, 2020). In Iran, 56.5 percent of nurses were confident in their knowledge (Nemati et al., 2020). (Hackett, 2020). (Hackett, 2020; Halcomb et al., 2020).

The vast majority of people who took part in this poll had the impression that the WHO recommendations were simple to understand and were not difficult to access. In contrast to the results of this study, a study conducted in Australia found that only 47.3% of participants had access to COVID-19-specific instructions (Halcomb et al., 2020). As the outbreak progressed, there were a number of people who held the opinion that the shifting recommendations were a source of contention. It is advised that restrictions be changed in accordance with the stage of the pandemic or the amount of time that has passed since the previous stage (Krist et al., 2020).

Nurses' access to personal protective equipment for airborne precautions in their unit

According to the findings of a recent study, nurses' preparedness and preparation for personal protective equipment received a mean score of 14.36 out of 18. 63.6 percent of respondents indicated that the level of preparedness and readiness of nurses for personal protective equipment was good, 24.2 percent said that the level of preparedness and readiness was average, and 12.1 percent said that the level of preparedness and readiness was poor.

It was discovered that coveralls, N95 respirators, and motorized air-purifying respirators were the most hardest to get. Personal protective equipment is something that nurses rely on in order to keep themselves and their patients safe (PPE). It is absolutely necessary to have a sufficient quantity of personal protective equipment (PPE) in order to combat this outbreak. The results of a survey of nurses conducted on Personal Protective Equipment (PPE) by the Royal College of Nursing (RCN) differ from those of the current study. The RCN investigation revealed that the fate of 54 percent of the nurses who took part in the study was to be forced to care for COVID-19 patients without the appropriate protection.

When questioned about their experiences with donning and doffing procedures, the majority of these nurses, who accounted for 81.8 percent of the responses, claimed that they had felt uneasy and frightened because they had not gotten the required training. Bergman et al. (2012) conducted a research to investigate the effect that prolonged use has on the fit of a filtering face-piece respirator used by registered nurses. In the past, around 87 percent of the responders who were there re-used the one-time-use disposable respirator masks (Bergman et al., 2012). The findings of the study indicate that reusing personal protective equipment (PPE) raises the risk of exposure. [Citation needed] The findings of this study, which demonstrated a lack of

personal protective equipment (PPE) among health-care employees, are supported by a substantial body of evidence, which may be found here.

Previous research conducted by Al Baalharitha and Pappiya (2021) revealed that ten percent of participants did not have surgical masks, and that all participants used the same mask during the entirety of their shift. This mask was worn for the entire duration of the shift. Because there were not enough N95 masks, nurses had no choice but to put their own health at jeopardy in order to provide care for patients who were extremely contagious (Fisher & Shaffer, 2014).

According to Ippolito et al. (2021), the FFP2 and FFP3 respirators or equivalents were the masks that were used for ordinary work the most frequently, and there was a statistically significant gap between the United States and other countries in this regard. The findings of this study are in direct contrast to those that were previously reported by Ippolito et al. (2021).

Factors associated with nurses' knowledge and preparedness

The average score of nurses' understanding of preparedness and reaction varied greatly depending on their ages, with those aged 20 to 29 demonstrating the biggest advantage over their older counterparts. In addition, the degree of experience of the nurses had a substantial impact on the mean score they received for their grasp of preparedness and reaction. On average, the nurses who had between 6 and 10 years of experience had the highest scores. It was shown that nurses working in Al-Awali had a much higher mean score of preparedness and response knowledge compared to nurses working in other areas.

According to the conclusions of this study, having a knowledge score that is quite high may be one of the benefits of being young. It's possible that their age had a factor in how well they were able to remember facts pertaining to COVID-19. They were determined to have outstanding knowledge despite having a little amount of experience due to the cutting-edge nature of the teaching that they were receiving at the time.

It is very necessary to increase both preparedness and readiness in order to rescue patients as well as society as a whole generally. Ethiopia is the only country for which data on the preparedness of healthcare personnel for the current outbreak are available (Mahmood et al., 2018). In light of this, the purpose of the study is to find out how well-prepared primary healthcare nurses are in an environment with limited resources, information that can be utilized to improve the degree to which they are prepared for the purposes of this study.

CONCLUSION

Nurses who participated in the current study had a high level of awareness on pandemic preparedness and response. The level of readiness and preparation shown by the nurses with regard to personal protective equipment is insufficient. Age, years of experience, and the area in which nurses operate are all factors that influence their level of readiness and knowledge.

RECOMMENDATIONS

It is important for future research studies to offer more information about additional aspects that might impact nurses' understanding regarding preparedness and reaction to the COVID-19 pandemic. These investigations should be carried out.

It is strongly advised that future research studies carry out similar investigations and compare the results with those of hospital-based studies in order to implement the activities and choices that have been proposed.

RESEARCH LIMITATIONS

The self-reported bias of the participants and the small sample size are limiting factors of the study. Only primary healthcare facilities participated in this study, and only one location had its preparedness and response assessed. The findings of this study were only able to be generalized to a certain extent since it was designed using a cross-sectional methodology and used a convenience sampling approach.

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LIST OF ABBREVIATIONS

WHO	World Health Organization
MOH	Ministry of Health
MERS	Middle East Respiratory Syndrome
PPE	Personal Protective Equipment
ANOVA	Analysis of Variance

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