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The perceptions and experiences of health-care providers during Covid-19 pandemic in Karachi, Pakistan: an exploratory qualitative study

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Abstract

Objective: To explore frontline healthcare workers perspectives and experiences of the barriers and facilitators to treat and manage Covid-19 cases.

Design and Setting: We conducted an exploratory qualitative study using a purposive sampling approach, at a private tertiary care teaching hospital in Karachi, Pakistan. Study data was analysed manually using the conventional content analysis technique.

Participants: Key-informant interviews were conducted with senior management and hospital leadership and in-depth interviews were conducted with frontline healthcare providers.

Results: A total of 31 interviews (KIIs=19; IDIs=12) were conducted, between April and May 2020. Three overarching themes emerged. The first was 'challenges faced by frontline healthcare providers working in Covid-19 wards. Healthcare workers experienced increased anxiety due to the fear of acquiring infection and transmitting it to their family members. They felt overwhelmed due to the exhaustive donning and doffing process, intense work, and stigmatization. The second theme was 'enablers supporting healthcare providers to deal with Covid-19 pandemic'. Frontliners pointed out several enabling factors that supported hospital staff including a safe hospital environment, adequate trainings, strong system of information sharing and supportive management. The third theme was 'recommendations to support healthcare workforce during the Covid-19 crisis'. Healthcare workers recommended measures to mitigate current challenges including providing risk allowance to frontliners, preparing a backup health workforce, and establishing a platform to address the mental health needs of the frontliners.

Conclusion: This study provides initial evidence base of healthcare providers' experiences of managing Covid-19 patients in the early stage of the pandemic and highlights measures needed to address the encountered challenges. It offers lessons for hospitals in LMICs to ensure a safe working environment for frontline workers in their fight against Covid-19.

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Keywords: Covid-19, healthcare providers experiences, exploratory qualitative study, Pakistan

Strengths and limitations of this study

- The frontline healthcare workers are uniquely positioned to address some of the most pressing issues related to the Covid-19 pandemic; thus, this study is positioned well to explore experiences of the barriers and facilitators to treat and manage Covid-19 cases.
- One limitation is that to minimise the risk of infection all study respondents were interviewed online over Zoom and hence the authors did not have the opportunity to build rapport with the respondents or obtain non-verbal cues during interviews.
- The study was unable to conduct focus group interviews, due to the nature of outbreak prevention, which would have provided in-depth information about personal and group feelings.

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Background

Countries around the world are facing unprecedented challenge and are struggling to cope with the Covid-19 pandemic[1]. First discovered in Wuhan, China; Covid-19 has swiftly travelled borders over the last couple of months leaving a trail of high morbidity and mortality with devastating effect on economies[2]. As of June 22, 2020, there have been 9,071,341 confirmed cases globally, with 471,162 deaths[3]. Moreover, 181,088 Covid-19 cases and 3,590 deaths have been reported in Pakistan[4].

Pakistan share borders with China and Iran; one being the epicentre of the disease and other has seen exponential increase of cases, respectively[5]. The rapidly evolving pandemic has stressed the entire healthcare system of Pakistan and outpaced the capacity of hospitals to meet demand for vital medical resources, such as ventilators, intensive care units (ICU) beds, and personal protective equipment (PPE) [5]. The hospitals in Pakistan are in the midst of responding to the pandemic and are adopting urgent and innovative approaches. These include aspects such as: setting up designated isolation wards for patients diagnosed with Covid-19, procuring and distributing PPE, conducting screening and performing diagnostic tests, delaying non-emergency procedures, and shifting from onsite to tele-consultation OPD services[6, 7].

Since the time Covid-19 has hit countries, scientific evidence is clustering more around understanding the disease transmission and its pathogenicity. While disease epidemiology is important to understand the spread and risk factors, there is also a need to explore and understand experiences and perceptions of health workforce involved in the Covid-19 crisis[8]. As the numbers are increasing, healthcare providers around the world are playing a central role and are making great contributions, while simultaneously facing great challenges[9]. The frontline healthcare workers across the world are uniquely positioned to address some of the

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most pressing issues related to the Covid-19 pandemic such as: physical burnout due to increase workload, mental exhaustion, fear of becoming infected and infecting others, sense of helplessness due to unavailability of personal protective gear, etc[10, 11]. Experiences from previous epidemics showed that while healthcare workers are often resilient, they require the same physical, psychological and social support as others in times of turmoil[12-16]. Initial research into the physical, emotional and psychological effects of Covid-19 on health workforce managing Covid-19 patients in Wuhan showed that intensive work tends to drain frontline healthcare providers physically and emotionally[9, 16].

It is therefore significant to not only look to our current scientific knowledge but also to collect and interpret data on the specific ways this outbreak influences our frontline healthcare workers. This crises situation necessitates investigating frontline healthcare workers perspectives and experiences of the barriers and facilitators to treat and manage Covid-19 cases. This study provides a holistic view of health-care providers' experiences for the international community and emphasises on the factors that are necessary to improve the experiences of health-care providers dealing with Covid-19 pandemic.

Methods

Study design and setting

This formative research employed an exploratory qualitative research design using semi-structured interviews and a purposive sampling approach. The study was conducted at the private tertiary care teaching hospital in Karachi, Pakistan.

Data Collection Methods and study participants

The data collection methods for this formative research included key-informant interviews (KIIs) and in-depth interviews (IDIs). Key informants were purposively identified and

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recruited from senior management and hospital leadership, directly or indirectly involved with the management of Covid-19 patients. Similarly, participants for In-depth interviews were also purposively recruited and included frontline healthcare providers, directly involved in the care of Covid-19 patients such as, doctors, nurses, and pharmacists.

Data Collection Procedure

Semi-structured interview guides were designed for KIIs and IDIs. The interview involved a discussion on perceptions about Covid-19 outbreak, along with the barriers and facilitators experienced by healthcare providers while caring for Covid-19 patients. The interview guides were pilot tested with a non-study sample (2 KIIs & 2 IDIs) with the same characteristics as the study sample. The pilot testing offered evidenced-base guidance to improve data collection guides. Before beginning interview, the study investigators explained the study objectives and procedures to eligible healthcare providers and obtained informed consent for their participation in the study. Trained researchers, experienced in qualitative research, conducted online interviews using Zoom. The interviews were conducted in the languages of English and/or Urdu. Study participants were assured that their anonymity will be maintained. Informed consent was also obtained for notetaking and audiorecording of the interview.

Key-informant interviews (KIIs)

A total of 19 KIIs were conducted with senior management and hospital leadership. These KIIs were conducted to understand the barriers and facilitators faced while managing Covid-19 cases at AKUH. The Key Informents were electronically invited to participate in the qualitative study. Each KII took approximately between 30 and 45 minutes.

In-Depth Interviews (IDIs)

IDIs were conducted with frontline healthcare providers including doctors, nurses and pharmacist who were directly involved in caring for Covid-19 patients. A total of 12 IDIs

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interviews were conducted with group of frontline healthcare providers. The healthcare providers were identified from the AKUH Covid-19 in-patient wards and out-patient screening and testing areas. Frontline healthcare providers were electronically invited to participate in their off-duty hours. Each IDI took approximately between 30 and 45 minutes.

Data analysis

Study data was analysed manually using the conventional content analysis technique[17]. Firstly, the audio recordings from the interviews were transcribed and then translated into English language. No identifying characteristics were included in the transcriptions. Transcripts were read several times by four research investigators to develop an interpretation of the perspectives and experiences of the barriers and facilitators to treat and manage Covid-19 cases. This involved an iterative process where data were coded, compared, contrasted, and refined to generate emergent themes. The transcribed text was divided into 'meaning units' which was later shortened and labelled with a 'code' without losing the study context. Codes were then analysed and grouped into similar categories. In the final step, similar categories were assembled under sub-themes and main themes. Two independent investigators performed the coding, and category creation, and discrepancies were resolved through discussion until a consensus was reached.

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Ethical considerations

Ethical approval for this study was obtained from the Aga Khan University Ethical Review Committee (AKU-ERC) – [2020-3694-9056].

Patient and Public Involvement

Patient public involvement is a relatively new concept in Pakistan. Our data collection tool was piloted through two IDIs to ensure that it is inclusive and comprehensive. Frontline healthcare providers were not involved in the development of research question and design, and data collection decisions.

Results

In this qualitative study, 19 KIIs and 12 IDIs were conducted, between April and May 2020, with a variety of participants including, residents, registered nurses, head nurses, nurse managers, pharmacists, senior management, and few key individuals from leadership positions. Data collection was ceased once saturation was achieved. The demographic information for the KIIs and IDIs participants are illustrated in Table 1. All the study participants (n=31) who were approached by the study team agreed to participate in the study.

Table 1: Characteristics of KII and IDI Study Participants (KII=19; IDI=12)

Characteristics of KII participants		N (%) or mean ± SD	Median (range)
Gender	Female	11 (57.9%)	
	Male	8 (42.1%)	
Age		45.46 ± 6.97	45 (34-58)
Designation	Professor	5 (26.3%)	
	Associate professor	7 (36.8%)	

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	Assistant professor	2 (10.5%)	
	Manager	3 (15.8%)	
	Leadership role	2 (10.5%)	
Years of Experience		17.39 ± 10.95	19 (1-45)

Characteristics of IDI participants		N (%) or mean ± SD	Median (range)
Gender	Female	11 (91.7%)	
	Male	1 (8.3%)	
Age		33.7 ±8.64	31 (22-48)
Designation	Doctor	5 (41.7%)	
	Nurse	6 (50%)	
	Pharmacists	1 (8.3%)	
Years of Experience		9.41 ± 5.99	9 (2-20)

Based on the data collection and thematic analysis, three overarching themes were identified (I) Challenges faced by frontline healthcare providers working in Covid-19 wards; (II) Enablers supporting healthcare providers to deal with Covid-19 pandemic; and (III) Recommendations to support healthcare workforce during the Covid-19 crisis. The themes and categories are presented in Table 2.

Table 2: Themes and categories

Themes	Categories

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Challenges faced by frontline healthcare providers working in Covid-19 wards	• Concerns about management of Covid-19 cases • Fear of acquiring infection and transmitting to family members • Overwhelmed and exhausted by the workload and exhaustive donning and doffing process • Stigma associated with healthcare providers working in Covid-19 wards
Enablers supporting healthcare providers to deal with Covid-19 pandemic	• A safe and secured hospital environment • Adequate trainings and drills for dealing with Covid-19 cases • Strong hospital system of information sharing during Covid-19 crisis • Supportive management and leadership
Recommendations to support healthcare workforce during the Covid-19 crisis	• Prepare and train, backup health workforce • Ensuring motivation for frontline health workforce • Anticipate and address the mental health needs of the health workforce

Themes 1: Challenges faced by frontline healthcare providers working in Covid-19 wards

- *Concerns about management of* Covid-19 *cases*

While front line HCPs and senior management expressed their determination to offer services in these challenging times to manage Covid-19 patients, various concerns related to the treatment and management of Covid-19 cases were articulated. Dialogues with hospital senior management representatives indicated that standard operating procedures (SOPs) have been designed to manage Covid-19 cases, however, few frontlinecare providers believed that the presence of SOPs is fairly ambiguous. Expressing similar concerns, a pharmacist stated:

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"I have concerns about how to deal with patients ... We need a clear procedure for dealing with them. For example, when someone comes into the pharmacy, what procedures are we meant to follow" (IDI-08, Pharmacist).

During interviews, an insight into the initial practices of managing Covid-19 crisis was also probed. Senior hospital management mentioned that the hospital was fully prepared to manage this public health emergency since its epidemic in China. Contrary to this, front line physicians and nurses verbalized glimpses of an ad hoc management of outpatient hospital area for Covid-19 screening and testing, during the early phase of the pandemic. Furthermore, on one hand, senior management generally exhibited their satisfaction over the availability and provision of PPEs to front line health care providers. While on the other hand, shortages of PPEs were notified by few health care providers, alongside sanitizers while providing care to the patients.

"Sometimes we face shortage of sanitizers and other essential PPEs such as masks. I think that all the PPEs should be available at all times so that we are not worried. Sometimes doctors ask us to bring them a N95 mask and we are unable to do so because we do not have any" (IDI-02, Nurse)

Although, respondents appreciated the availability of negative pressure rooms during Covid-19 pandemic, concerns about the limited capacity of the hospital were verbalized for the efficient and timely management of Covid-19 cases. Few hospital staff reported that they experienced violent behaviour by the family in case of refusal to admit new patients.

- *Fear of acquiring infection and transmitting to family members*

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Due to the highly contagious nature of the coronavirus (SARS-CoV-2) and perceived uncertainty in contracting the disease, interviews with physicians and nurses revealed their apprehension in acquiring the virus while treating patients. The frontline workers face a unique mental health challenge and several respondents experienced feeling guilty about potentially carrying the virus to their families. Highlighting this point, one respondent stated:

"It is a stressful situation. By the end of the day when I am taking a break, I have many negative thoughts. I worry about carrying this infection to my family…I have a young daughter at home and nearly every day I worry about being asymptomatic and carrying this infection to my family" (IDI-07, Doctor).

The increased likelihood of contracting Covid-19 is also psychologically affecting the senior management team across the hospital. Due to their exposure; their family members are also at risk of acquiring the infection.

"I work in the emergency department so I always have a fear that the next patient I see will need serious treatment and I may have to resuscitate him/her. But now, I always have a fear that the next patient will be Covid-19 positive and that they may infect me. And if I get infected my family will get infected. So, this fear is a little bit different and it will last till the pandemic last" (IDI-12, Doctor)

While verbalizing the concerns about the HCPs exposure in getting infected, respondents also voiced their concerns that front line staff is at high risk of getting infected even in non-Covid-19 areas across the hospital setting.

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- *Overwhelmed and exhausted by the workload and exhaustive donning and doffing process*

In order to protect frontline workers against Covid-19, the infection control policy at AKUH mandates that all staff working in areas where Covid-19 patients are suspected wear a full sleeve impervious gown, gloves, and a N95 mask. While this policy is no doubt effective and in line with the best interest of the frontline workers, it poses several challenges. For instance, our interviews revealed that several participants found the N95 mask suffocating to wear for a prolonged period of time. Commenting on the experience of wearing full PPE one frontline worker stated:

"We...get tired of wearing full PPE because we have to be in the room with the patient for four hours. It gets really hot and the extra layers of protection weigh heavy on the body" (IDI-11, Nurse).

Moreover, another respondent highlighted how the process of using PPE is complicated when staff are required to visit one patient to another. This occurs because the staff have to meticulously switch in and out of PPEs. Therefore, what was initially a mundane process has now become a critical aspect of infection control. This point was illustrated by a respondent who stated:

"It takes around 5-7 minutes to put on our PPEs. We then go to the patient's room... come back and spend the same amount of time to switch our PPEs before going to the next patient room. This process is a big hassle and is time consuming. But we have to

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be extra careful, if this procedure is not done properly, we can pass on the infection" (IDI-07, Doctor).

While this process is no doubt challenging, one respondent offered an encouraging remark stating:

"Initially we felt that our workload has increased, however, with the passage of time we have become used to it and things feel normal" (IDI-16, Nurse).

- *Stigma associated with healthcare providers working in Covid-19 wards*

Covid-19 is primarily transmitted from symptomatic people to others through direct contact, or by contact with contaminated objects and surfaces. Moreover, a large portion of those infected are asymptomatic, meaning they show no overt markers of the infection. As a result of this, frontline workers face a unique mental health challenge. Since they work in high risk environments many opt to hide details about their work life in fear of being stigmatized by their communities.

"I know that in some cases health care workers do not tell their families and communities that they are working with Covid-19 patients. They fear that this will cause unnecessary panic and people may view them differently" (KII-19, Associate Professor).

It is likely that this anxiety within the families and communities of health care workers is propagated by the ambiguity of information available on Covid-19. It is possible that the

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hospital may address many of these issues by extending its outreach services. During the interviews, a frontline worker was critical of the hospitals current outreach services:

"Our services should be extended to the community. Compared to other institutions we have not done enough. Many people have criticized us in this pandemic" (IDI-08, Pharmacist).

By providing more extensive services to surrounding communities, the hospital could not only alleviate the stigma faced by front line workers, but also reduce the surge of false information.

Theme 2: Enablers supporting healthcare providers to deal with Covid-19 pandemic

- *A safe and secured hospital environment*

Many respondents stated that the hospital has provided a safe environment for employees, and that safety measures have been improved as the hospital administration became more knowledgeable about the nature of this disease. One respondent stated the hospital's disaster management and incident command system were ensuring adequate training and smooth communication throughout the hospital.

When the number of cases started increasing, the hospital enacted the Hospital Incident Command System, leaders from each of the different areas i.e. logistics, communications, medicine, etc came together to make sure that everything was in place- . The hospital has now made smaller groups which meet regularly to go over

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each of the issues and an executive Operations Command Committee goes over what should be done." (KII-19, Associate Professor)

While provisions are made for availability of PPE for the staff, many noted that implementation of proper usage of PPE and adequate hand hygiene is still a problem that requires behavioral change . It was also stated that health care providers that are considered vulnerable (i.e. elderly and/or have serious pre-existing conditions) are not allowed to work in the Covid-19 established areas.

While several precautions are being taken, one respondent claimed that there were many places for improvement. One stated that it is complacent to feel good about any sense of safety and security, and that it is important to remain vigilant in the case of new information about the disease or a high influx of patients.

"There are several places where things can slip through the cracks, and cause problems, and there are several points that will fail if they come under pressure- I am not absolutely confident, but it is good so far." (KII- 16, Professor)

- *Adequate trainings and drills for dealing with Covid-19 cases*

When questioned about trainings and drills, most respondents stated that everyone who is working for Covid-19 is trained in the usage of PPE, N95 mask, donning and doffing, and taking test samples using nasopharyngeal swabs. Many also said that regular training was being carried out on the job and at the CIME, and that master trainers were being trained to then

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disseminate information and train the rest of the department. Covinars (Covid Webinar) sessions are being conducted to help train and provide information about the disease.

We have completed 2-day training workshops or seminars and get trained every day in new technologies and when new guidelines come" (IDI-02, Nurse)

However, some specialists were concerned that very little had been done in the way of training; it was noted that besides guidance on N95 mask fitting test, there were no opportunities to go through any drills. While communications were being carried out, it was not considered sufficient. Others said that while trainings were being conducted, they were not very regular. While they stated that this may be because of the social distancing measures, they insisted on more regular online trainings.

- *Strong hospital system of information sharing during Covid-19 crisis*

While the outbreak of Covid-19 has put immense pressure and stress on the hospital staff, there are many facilitators that support the hospital staff to deal with the pandemic. Respondents stated that information was being shared through video messages and that helplines and hotlines for staff and the public were effective in screening for Covid-19 symptoms. While many stated that information sharing was difficult at first, it was claimed that this was due to the changing information coming about the disease from international agencies It was reported that the hospital leadership holds weekly meetings with senior management, who then circulate that within their respective departments.

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"I think we have a reasonably good system built for disaster and we have a very defined chair of command… There have been different working groups formed for Covid-19 and they all have specialized tasks for information sharing, and there is a Covid-19 hotline for employees and the public and that is adequate." (KII-16, Professor)

In addition, university-wide town hall meetings were held regularly. It was suggested that more town halls should be carried out, and that regular memos should be sent with information about caring for those with the disease.

"Town halls boosted the morale of the health care providers, and this communication was very good." (KII-3, Professor)

- *Supportive management and leadership*

Most in-depth interview participants mentioned that senior management and institutional leadership is providing immense support by ensuring appropriate provision of protective equipment (PPE) in the Covid-19 and non Covid-19 wards to ensure safety of frontline healthcare providers. In addition, few participants mentioned that the institutional leadership regularly visit Covid-19 units for staff appreciation and encouragement. Besides, the senior management responds to healthcare providers concerns in a timely manner through a WhatsApp group.

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"Initially, we were supposed to remain inside the patient room consecutively for 4 hours. This was very exhausting for bedside nurses especially since we have to wear three layers of PPE. We raised these concerns and senior management has now permitted us to exit the room when the patients condition gets stable … we now observe the patients from the mirrored door. This has given us a huge relief" (IDI-11, Nurse)

While frontline providers appreciated the support received from management and institutional leadership, they also recognized the efforts of all other support departments who are working together for safety of frontline hospital staff. These support departments include finance, design office, construction, laundry, purchase and supply chain management, safety and security, human resource, information and technology department, nutrition and food services, marketing and communications, travel services, etc.

"All the support departments are contributing in the same manner as our frontline healthcare providers" (KII-01, Professor)

In addition, the few IDI participants mentioned that institutional leadership has arranged accommodation facilities for the frontline staff who are working in Covid-19 wards but the hospital staff is not availing those services because they have their families and children back home. Few respondents further stated that the senior management has also ensured the provision of shower facilities for the frontline hospital staff; however due to time limitations nurses are unable to make effective use of those facilities.

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Theme 3: Recommendations to support healthcare workforce during the Covid-19 crisis.

- *Prepare and train, backup health workforce*

Both IDI and KII participants mentioned that they have been experiencing staff shortages in Covid-19 wards because many of the frontline health care providers have been either quarantined or isolated due to exposure. When asked about recommendations to support frontline health workforce, most IDI respondents suggested that healthcare providers (doctors and nurses) of other sub-specialties (neurology, cardiac, surgery, orthopaedic) need to be trained as a backup to mitigate situations when entire internal medicine teams may be placed in self-quarantine due to Covid-19 exposure. In addition, few key-informants recommended that there should be a central backup plan for staff coverage in both Covid-19 and routine wards.

"Currently, only the healthcare providers of Covid-19 wards have received specialized trainings on ventilator code, BIPAP management, and handling body of expired Covid-19 patient. However, these trainings should be given to all healthcare staff across the institution to prepare a central backup". (IDI-03, Nurse)

- *Ensuring motivation for frontline health workforce*

To ensure enthusiasm among front liners, study respondents highlighted the need of appreciating and motivating frontline providers for their countless efforts in this pandemic battle.

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Most IDIs including frontline nurses suggested that risk allowance should be given to all frontline healthcare providers involved in treatment and management of Covid-19 patients. Healthcare providers suggested that instead of giving extra time off, hospital staff should be compensated for taking additional risks, while caring for Covid-19 cases.

As you know the world is very materialistic and people always need motivation. While we are being encouraged by senior management, this form of verbal motivation will only work for a time period. If the current situation is going to go on, we will need to give people an added incentive in the form of material compensation. This can either be more money or additional days off (IDI-04, Nurse).

In addition, respondents verbalized that some activities for staff entertainment should also be thought about to alleviate stress and anxiety associated with this crisis situation among healthcare providers.

- *Anticipate and address the mental health needs of the health workforce*

IDI and KII respondents mentioned that there is no formal platform established where front liners voices are being heard. Such a platform could provide an opportunity to anticipate and address the mental health needs of the frontline health workforce.

Everyone is very stressed. I see it every time one of my staff has to take care of a suspected patient, they are hesitant and scared. Sometimes, I feel the same way myself. We need an integrated counselling program. People should not just come for counselling when they are mentally struggling. Similar to how we have guidelines for

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PPE and social distancing we should have small group talks on ZOOM so that we can dispel our anxieties before they build up (KII 06, Associate Professor).

Few study participants particularly KIs appreciated the motivation sessions organized by psychiatric fellows on stress and coping. However, study respondents highlighted the need of arranging more psychiatric sessions for healthcare staff on a daily basis to cope with the stress. More specifically, participants stated that currently there is a blanket approach around mental health; however, more is needed to address varied concerns of the health workforce.

There was a zoom session arranged on stress management, but I was unable to attend it due to my duties. I think we need more of these sessions. We can even add more innovative things such as breathing exercises, mindfulness, and yoga. There is so much anxiety relating to Covid-19 both at work and in our homes. Everyone is so panicked and there is so much hype going around. These types of innovative sessions would really help (IDI-05, Doctor)

Discussion

To the best of our knowledge, this is the first study to explore perceptions and experiences of health-care providers during the Covid-19 Pandemic in Pakistan. The research identified challenges faced by healthcare providers while managing Covid-19 patients, alongside strategies to cope with these. The frontline healthcare providers pointed out several concerns that influenced their ability and willingness to treat and manage Covid-19 patients. These included shortage of PPEs and hand sanitizers, lack of clear SOPs, ad hoc management of hospital outpatient area for Covid-19 screening and testing, violent behavior by families of

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Covid positive patient, and limited capacity of hospital to treat and manage increasing Covid-19 positive patients. Notwithstanding some challenges that cannot be mitigated by the institution such as the increasing number of Covid positive patients and unexpected violent behavior of families of Covid-19 positive patients, a number of corrective actions that can be taken to lessen the impact of others.

Our results highlight, especially in the initial period of the crisis, differences in the responses received from senior management and frontline providers with regard to availability of PPEs and sanitizers, presence of clear SOPs, preparedness of hospital to manage Covid-19 pandemic. These discrepancies could be partly due to the communication gap between the two group of respondents (whereby senior management and hospital leadership was heavily involved in the process of designing new screening and testing site, procuring PPE, and updating SOPs considering the differential progression of the outbreak). Most have now been addressed through corrective actions by the hospital leadership during the last few weeks and months. As this is a leading private teaching hospital of the country, the senior management and hospital leadership was able to successfully address the gaps to improve the experiences of front liners involved in this pandemic. However, this may not be the case in most public sector hospitals, where front line healthcare workers continue to face challenges. The healthcare systems in LMICs face serious constraints in capacity and accessibility during normal times. This would be aggravated during Covid-19 outbreak, leading to worse clinical outcomes, poor quality healthcare and poor healthcare workers' experiences[18, 19].

Consistently with experiences from previous outbreaks and emergencies[18, 20], frontline healthcare workers providing care to Covid-19 patients experienced increased anxiety and stress. Our study found that the increased exhaustion among HCPs is due to the fear of

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acquiring infection and transmitting it to their family members. Anxiety and burnout among HCPs were also reported by studies conducted in high income countries (HICs) although countries were combating different stages of pandemic[18]. This may be due to standard changes in working hours, shortage in skilled workforce, and inadequate access to PPE[18]. The frontline providers in our study felt overwhelmed due to exhaustive donning and doffing process, intense work, and large number of patients, which was consistent with the studies on the outbreak of MERS-Cov[21, 22] and Ebola[23]. Our results undoubtedly show that stigma is a pressing issue for the frontline healthcare workers working in Covid-19 wards. Several studies have reported that there are several potential mechanisms by which stigma could affect HCWs outcomes[24, 25], and HCWs who experience higher levels of stigma reported increased physical (fatigue) and psychological distress (burnout)[26]. These pressures can lead to mental health problems for example burnout, anxiety, depression, insomnia, denial, anger, which not only influence frontline healthcare providers' attention, understanding, and decision making capacity, but could also have a long-lasting impact on their physical and psychological health after the Covid-19 emergency is over[9].

While the outbreak of Covid-19 put immense pressure and stress on the hospital staff, there were many enabling factors that supported hospital staff to deal with these aspects, which have progressively evolved over the duration of the pandemic. As a result of this pandemic, the entire hospital was able to pull together and many departments across the university hospital coordinated to ensure smooth and efficient operations . Findings suggest that the respondents felt that they were actively encouraged and supported by senior management and the university leadership. More specifically, the research subjects felt that over time the safe and secured hospital environment enabled HCPs to perform their routine tasks and reduce their feeling of uncertainty and fear. Similar findings have been reported by the qualitative study published in

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Lancet Global Health by Qian Liu and colleagues[27]. Our study found that the HCPs were appreciative of the trainings provided to them regarding use of PPE, N95 mask, donning and doffing, and taking test samples using nasopharyngeal swabs. However, it was reported that more drills could be conducted to improve their hand-on skills and reduce the risk of acquiring infection. Health workforce safety is a high priority and therefore it is essentially important to provide sufficient protective supplies and trainings and drills for effective management of Covid-19 cases[27]. A unique yet encouraging finding reported by our study participants was that the hospital developed a strong system of information sharing to keep faculty and staff updated about Covid-19 situation through video messages, hotlines, townhalls, and what are now called Covinars.

Our study also reported some recommendations to mitigate current challenges and further improve the experiences of HCPs working in Covid-19 wards. The frontline providers caring for Covid-19 patients felt extreme physical discomfort and fatigue due to long working hours and complicated donning and doffing process and suggested that institution should provide risk allowance to compensate HCPs for the additional risks they take and to motivate staff to continue to work. This finding is consistent with the previous experience from the outbreak of Ebola in western Africa, where risk allowance was adopted as a strategy for motivating and retaining healthcare workers[28]. Our study suggested to prepare and cross-train backup health workforce to effectively respond to staff shortages as many of the frontline HCPs have been either quarantined or isolated due to exposure. Similar recommendations have been provided by a number of studies conducted in diverse settings[29-31]. Our study also showed that a formal platform where front liners voices could be be heard did not exist. Respondents reported that such a platform could provide an opportunity to anticipate and address the mental health needs of the frontline health workforce. Experiences from similar outbreaks suggest that early

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psychological intervention and establishment of early support systems is particularly important for frontliners to promote emotional release and improve HCPs mental health[32].

This study was conducted in a leading private tertiary care teaching hospital in Karachi, Pakistan that offers state-of-the-art healthcare. The initial challenges progressively led to a fairly successful story. The same cannot be said for the large number of public and private hospitals in the country. The shortage of PPE has been a frequent occurrence and has even led to public protests, undoubtedly contributing to mental stress and distress. The experience gained from the current study offers lessons for other hospitals in the country to benefit from. There is no doubt that good quality healthcare against Covid-19 can only be ensured if the frontline workers are well taken care of in terms of their mental health and physical needs when asked to serve critically ill patients round the clock.

This study provides an initial evidence base of healthcare providers' experiences of managing Covid-19 patients in an early stage of pandemic when the participants just accepted the antiepidemic tasks. Diverging from the findings of various studies on the experience of negative emotions and barriers encountered during outbreak, we found that facilitators coexist with challenges, which supported front liners to effectively deal with crisis. One of the limitations of this study was that all study respondents were interviewed online, to minimize the risk of infection. The authors did not have the opportunity to build rapport with respondents over Zoom or obtain non-verbal cues during interviews. Secondly, due to the nature of outbreak prevention, the study was unable to conduct focus group interviews, which would have provided detailed information about personal and group feelings. In addition, this was a short-term study and does not include long-term experiences of the research subjects with this pandemic.

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571 Conclusion:

572 This study provides a holistic view of health-care providers' experiences and emphasizes that
573 adequate trainings and drills, sufficient PPE, a safe and secured hospital environment,
574 healthcare providers motivation, supportive hospital management and leadership, strong
575 hospital system of information sharing and psychological support to address mental health
576 needs of frontliners are necessary to improve the overall experiences of health-care providers
577 fighting Covid-19.

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Declaration of interests

Ethics approval and consent to participate

Ethical approval for this study was obtained from the Aga Khan University Ethical Review Committee (AKU-ERC) – [2020-3694-9056]. Written informed consent was provided by all study participants. Informed consent included permission to audio record the interviews and use anonymized quotes. Voluntary participation and the right to ask any questions and to decline participation at any time were emphasized during the data collection.

Consent for publication

Written informed consent for publication was obtained.

Competing interests

We declare no competing interests.

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

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Authors' contributions

All authors had full access to all the data in this study and take responsibility for the integrity of the data and the accuracy of the data analysis. SS, SSQ, ASF, NAP, ZHA, NA designed the study. ASF supervised data collection and analysis. ASF, NAP, ZHA, MMS collected the data. ASF, NAP, ZHA, MMS, SS analyzed and interpreted the data. ASF, NAP, ZHA, MMS wrote the first draft of the manuscript. All authors contributed to reviewing and editing the manuscript.

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Abstract

Objective: To explore healthcare providers' perspectives and experiences of the barriers and facilitators to treat and manage Covid-19 cases.

Design and Setting: We conducted an exploratory qualitative study using a purposive sampling approach, at a private tertiary care teaching hospital in Karachi, Pakistan. Study data were analyzed manually using the conventional content analysis technique.

Participants: Key-informant interviews (KIIs) were conducted with senior management and hospital leadership and in-depth interviews (IDIs) were conducted with frontline healthcare providers.

Results: A total of 31 interviews (KIIs=19; IDIs=12) were conducted, between April and May 2020. Three overarching themes emerged. The first was 'challenges faced by frontline healthcare providers working in Covid-19 wards. Healthcare workers experienced increased anxiety due to the fear of acquiring infection and transmitting it to their family members. They felt overwhelmed due to the exhaustive donning and doffing process, intense work, and stigmatization. The second theme was 'enablers supporting healthcare providers to deal with the Covid-19 pandemic'. Front liners pointed out several enabling factors that supported hospital staff including a safe hospital environment, adequate training, a strong system of information sharing, and supportive management. The third theme was 'recommendations to support the healthcare workforce during the Covid-19 crisis'. Healthcare workers recommended measures to mitigate current challenges including providing risk allowance to frontline healthcare providers, preparing a backup health workforce, and establishing a platform to address the mental health needs of the healthcare providers.

Conclusion: This study provides an initial evidence base of healthcare providers' experiences of managing Covid-19 patients in the early stage of the pandemic and highlights measures needed to address the encountered challenges. It offers lessons for hospitals in low-middle-

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income countries to ensure a safe working environment for frontline workers in their fight against Covid-19.

Keywords: Covid-19, healthcare providers experiences, exploratory qualitative study, Pakistan

Strengths and limitations of this study

- The frontline healthcare workers are uniquely positioned to address some of the most pressing issues related to the Covid-19 pandemic; thus, this study is positioned well to explore experiences of the barriers and facilitators to treat and manage Covid-19 cases.
- One limitation is that to minimize the risk of infection all study respondents were interviewed online over Zoom and hence the authors did not have the opportunity to build rapport with the respondents or obtain non-verbal cues during interviews.
- The study was unable to conduct focus group interviews, due to the nature of outbreak prevention, which would have provided in-depth information about personal and group feelings.

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Background

Countries around the world are facing the unprecedented challenge and are struggling to cope with the Covid-19 pandemic[1]. First discovered in Wuhan, China; Covid-19 has swiftly traveled borders over the last couple of months leaving a trail of high morbidity and mortality with devastating effect on economies[2]. As of June 22, 2020, there have been 9,071,341 confirmed cases globally, with 471,162 deaths[3]. Moreover, 181,088 Covid-19 cases and 3,590 deaths have been reported in Pakistan[4].

Pakistan shares borders with China and Iran; one being the epicenter of the disease and the other has seen an exponential increase of cases, respectively[5]. The rapidly evolving pandemic has stressed the entire healthcare system of Pakistan and outpaced the capacity of hospitals to meet the demand for vital medical resources, such as ventilators, intensive care units (ICU) beds, and personal protective equipment (PPE) [5]. The hospitals in Pakistan are in the midst of responding to the pandemic and are adopting urgent and innovative approaches. These include aspects such as: setting up designated isolation wards for patients diagnosed with Covid-19, procuring and distributing PPE, conducting screening and performing diagnostic tests, delaying non-emergency procedures, and shifting from onsite to tele-consultation out-patientservices[4, 5].

Since the time Covid-19 has hit countries, scientific evidence is clustering more around understanding the disease transmission and its pathogenicity. While disease epidemiology is important to understand the spread and risk factors, there is also a need to explore and understand experiences and perceptions of the health workforce involved in the Covid-19 crisis[6]. As the numbers are increasing, healthcare providers around the world are playing a central role and are making great contributions, while simultaneously facing great challenges[7]. The frontline healthcare workers across the world are uniquely positioned to address some of the most pressing issues related to the Covid-19 pandemic such as: physical

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burnout due to increase workload, mental exhaustion, fear of becoming infected and infecting others, sense of helplessness due to unavailability of personal protective gear, etc[8, 9]. Experiences from previous epidemics showed that while healthcare workers are often resilient, they require the same physical, psychological, and social support as others in times of turmoil[10-14]. Initial research into the physical, emotional, and psychological effects of Covid-19 on the health workforce managing Covid-19 patients in Wuhan showed that intensive work tends to drain frontline healthcare providers physically and emotionally[7, 14].

It is, therefore, significant to not only look to our current scientific knowledge but also to collect and interpret data on the specific ways this outbreak influences our frontline healthcare workers. This crisis situation necessitates investigating healthcare providers' perspectives and experiences of the barriers and facilitators to treat and manage Covid-19 cases. This study provides an understanding of the factors that are necessary to improve the experiences of healthcare providers dealing with the Covid-19 pandemic.

Methods*Study design and setting*

This formative research employed an exploratory qualitative research design using semi-structured interviews and a purposive sampling approach. The study was conducted at the private tertiary care teaching hospital in Karachi, Pakistan.

Data Collection Methods and study participants

The data collection methods for this formative research included key-informant interviews (KIIs) and in-depth interviews (IDIs). Key informants were purposively identified and recruited from senior management and hospital leadership, directly or indirectly involved with the management of Covid-19 patients. Similarly, participants for In-depth interviews were also purposively recruited and included frontline healthcare providers, directly involved in the care of Covid-19 patients such as doctors, nurses, and pharmacists.

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Data Collection Procedure

Semi-structured interview guides were designed for KIIs and IDIs. The interview guides for KIIs and IDIs are provided in online supplemental annexes 1 and 2 The interview involved a discussion on perceptions about the Covid-19 outbreak, along with the barriers and facilitators experienced by healthcare providers while caring for Covid-19 patients. The interview guides were pilot tested with a non-study sample (2 KIIs & 2 IDIs) with the same characteristics as the study sample. The pilot testing offered evidenced-base guidance to improve data collection guides. Before beginning the interview, the study investigators explained the study objectives and procedures to eligible healthcare providers and obtained informed consent for their participation in the study. Trained researchers, experienced in qualitative research, conducted online interviews using Zoom. The interviews were conducted in the languages of English and/or Urdu. Study participants were assured that their anonymity will be maintained. Informed consent was also obtained for notetaking and audio-recording of the interview.

Key-informant interviews (KIIs)

A total of 19 KIIs were conducted with senior management and hospital leadership. These KIIs were conducted to understand the barriers and facilitators faced while managing Covid-19 cases at Aga Khan University Hospital (AKUH). The key informants were electronically invited to participate in the qualitative study. Each KII took approximately between 30 and 45 minutes.

In-Depth Interviews (IDIs)

IDIs were conducted with frontline healthcare providers including doctors, nurses, and pharmacists who were directly involved in caring for Covid-19 patients. A total of 12 IDIs interviews were conducted with a group of frontline healthcare providers. The healthcare providers were identified from the AKUH Covid-19 in-patient wards and out-patient screening

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and testing areas. Frontline healthcare providers were electronically invited to participate in their off-duty hours. Each IDI took approximately between 30 and 45 minutes.

Data analysis

Study data were analyzed manually using the conventional content analysis technique[15]. Firstly, the audio recordings from the interviews were transcribed and then translated into the English language. No identifying characteristics were included in the transcriptions. Transcripts were read several times by four research investigators to develop an interpretation of the perspectives and experiences of the barriers and facilitators to treat and manage Covid-19 cases. This involved an iterative process where data were coded, compared, contrasted, and refined to generate emergent themes. The transcribed text was divided into 'meaning units' which were later shortened and labeled with a 'code' without losing the study context. Codes were then analyzed and grouped into similar categories. In the final step, similar categories were assembled under sub-themes and main themes. Two independent investigators (NAP and ASF) performed the coding, and category creation and discrepancies were resolved through discussion until a consensus was reached.

Trustworthiness of the Study:

Tracy et al. [16] and Lincoln and Guba's criteria [17] were used to establishing trustworthiness and methodological rigor. To ensure credibility, the study triangulated data via two basic types of triangulation: data source triangulation (exploring insights of different groups- healthcare providers and key-informants) and investigator triangulation (use of multiple researchers in analysis phase -NAP & ASF)[18]. Study rigor was also be enhanced through member checking of transcripts and synthesized data to confirm whether study results have resonance with the participants' experience[19]. Since our study used a qualitative approach, it was more interested in gaining an understanding of providers' experiences of Covid-19 management rather than aiming at singular truth and generalization. Patton and Rolfe emphasize that the

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qualitative inquiry often prioritize depth over breadth through studying smaller samples and even single case and often makes very limited claims about the study external validity[20, 21].

Ethical considerations

Ethical approval for this study was obtained from the Aga Khan University Ethical Review Committee (AKU-ERC) – [2020-3694-9056].

Patient and Public Involvement

Patient public involvement is a relatively new concept in Pakistan. Our data collection tool was piloted through two IDIs to ensure that it is inclusive and comprehensive. Frontline healthcare providers were not involved in the development of research questions and design, and data collection decisions.

Results

In this qualitative study, 19 KIIs and 12 IDIs were conducted, between April and May 2020, with a variety of participants including, residents, registered nurses, head nurses, nurse managers, pharmacists, senior management, and few key individuals from leadership positions. Data collection was ceased once saturation was achieved; saturation refers to the point in the research process when no new information is discovered in data analysis[22]The small number of qualitative interviews allowed us to dug into the depth of each interview to understand the unique perspectives and experiences of healthcare providers regarding Covid-19. The demographic information for the KIIs and IDIs participants is illustrated in Table 1. All the study participants (n=31) who were approached by the study team agreed to participate in the study.

Table 1: Characteristics of KII and IDI Study Participants (KII=19; IDI=12)

Characteristics of KII participants		N (%) or Median (range)
Gender	Female	11 (57.9%)

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	Male	8 (42.1%)
Age		45 (34-58)
Designation	Professor	5 (26.3%)
	Associate professor	7 (36.8%)
	Assistant professor	2 (10.5%)
	Manager	3 (15.8%)
	Leadership role	2 (10.5%)
Years of Experience		19 (1-45)

Characteristics of IDI participants		N (%) or Median (range)
Gender	Female	11 (91.7%)
	Male	1 (8.3%)
Age		31 (22-48)
Designation	Doctor	5 (41.7%)
	Nurse	6 (50%)
	Pharmacists	1 (8.3%)
Years of Experience		9 (2-20)

Based on the data collection and thematic analysis, three overarching themes were identified (I) Challenges faced by frontline healthcare providers working in Covid-19 wards; (II) Enablers supporting healthcare providers to deal with Covid-19 pandemic; and (III) Recommendations to support healthcare workforce during the Covid-19 crisis. The themes and categories are presented in Table 2.

Table 2: Themes and categories

Themes	Categories
Challenges faced by frontline healthcare providers working in Covid-19 wards	• Concerns about the management of Covid-19 cases • Fear of acquiring infection and transmitting to family members • Overwhelmed and exhausted by the workload and exhaustive donning and doffing process • The stigma associated with healthcare providers working in Covid-19 wards

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Enablers supporting healthcare providers to deal with Covid-19 pandemic	• A safe and secured hospital environment • Adequate training and drills for dealing with Covid-19 cases • The strong hospital system of information sharing during the Covid-19 crisis • Supportive management and leadership
Recommendations to support healthcare workforce during the Covid-19 crisis	• Prepare and train backup health workforce • Ensuring motivation for frontline health workforce • Anticipate and address the mental health needs of the health workforce

Themes 1: Challenges faced by frontline healthcare providers working in Covid-19 wards

- *Concerns about the management of* Covid-19 *cases*

While front-line healthcare providers and senior management expressed their determination to offer services in these challenging times to manage Covid-19 patients, various concerns related to the treatment and management of Covid-19 cases were articulated. Dialogues with hospital senior management representatives indicated that standard operating procedures (SOPs) have been designed to manage Covid-19 cases, however, few frontline care providers believed that the presence of SOPs is fairly ambiguous. Expressing similar concerns, a pharmacist stated:

"I have concerns about how to deal with patients ... We need a clear procedure for dealing with them. For example, when someone comes into the pharmacy, what procedures are we meant to follow" (IDI-08, Pharmacist).

During interviews, an insight into the initial practices of managing the Covid-19 crisis was also probed. Senior hospital management mentioned that the hospital was fully prepared to manage

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this public health emergency since its epidemic in China. Contrary to this, front-line physicians and nurses verbalized glimpses of an ad hoc management of outpatient hospital areas for Covid-19 screening and testing, during the early phase of the pandemic. Furthermore, on one hand, senior management generally exhibited their satisfaction over the availability and provision of PPEs to front-line health care providers. While on the other hand, shortages of PPEs were notified by few health care providers, alongside sanitizers while providing care to the patients.

"Sometimes we face a shortage of sanitizers and other essential PPEs such as masks. I think that all the PPEs should be available at all times so that we are not worried. Sometimes doctors ask us to bring them an N95 mask and we are unable to do so because we do not have any" (IDI-02, Nurse)

Although respondents appreciated the availability of negative pressure rooms during the Covid-19 pandemic, concerns about the limited capacity of the hospital were verbalized for the efficient and timely management of Covid-19 cases. Few hospital staff reported that they experienced violent behavior by the family in case of refusal to admit new patients.

- *Fear of acquiring infection and transmitting to family members*

Due to the highly contagious nature of the coronavirus (SARS-CoV-2) and perceived uncertainty in contracting the disease, interviews with physicians and nurses revealed their apprehension in acquiring the virus while treating patients. The frontline workers face a unique mental health challenge and several respondents experienced feeling guilty about potentially carrying the virus to their families. Highlighting this point, one respondent stated:

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"It is a stressful situation. By the end of the day when I am taking a break, I have many negative thoughts. I worry about carrying this infection to my family…I have a young daughter at home and nearly every day I worry about being asymptomatic and carrying this infection to my family" (IDI-07, Doctor).

The increased likelihood of contracting Covid-19 is also psychologically affecting the senior management team across the hospital. Due to their exposure; their family members are also at risk of acquiring the infection.

"I work in the emergency department so I always have a fear that the next patient I see will need serious treatment and I may have to resuscitate him/her. But now, I always have a fear that the next patient will be Covid-19 positive and that they may infect me. And if I get infected my family will get infected. So, this fear is a little bit different and it will last till the pandemic last" (IDI-12, Doctor)

While verbalizing the concerns about the healthcare providers' exposure in getting infected, respondents also voiced their concerns that front line staff is at high risk of getting infected even in non-Covid-19 areas across the hospital setting.

- *Overwhelmed and exhausted by the workload and exhaustive donning and doffing process*

To protect frontline workers against Covid-19, the infection control policy at AKUH mandates that all staff working in areas where Covid-19 patients are suspected wear a full sleeve impervious gown, gloves, and an N95 mask. While this policy is no doubt effective and in line with the best interest of the frontline workers, it poses several challenges. For instance, our interviews revealed that several participants found the N95 mask suffocating to wear for a

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prolonged period of time. Commenting on the experience of wearing full PPE one frontline worker stated:

"We...get tired of wearing full PPE because we have to be in the room with the patient for four hours. It gets really hot and the extra layers of protection weigh heavy on the body" (IDI-11, Nurse).

Moreover, another respondent highlighted how the process of using PPE is complicated when staff is required to visit one patient to another. This occurs because the staff has to meticulously switch in and out of PPEs. Therefore, what was initially a mundane process has now become a critical aspect of infection control. This point was illustrated by a respondent who stated:

"It takes around 5-7 minutes to put on our PPEs. We then go to the patient's room... come back and spend the same amount of time to switch our PPEs before going to the next patient's room. This process is a big hassle and is time-consuming. But we have to be extra careful, if this procedure is not done properly, we can pass on the infection" (IDI-07, Doctor).

While this process is no doubt challenging, one respondent offered an encouraging remark stating:

"Initially we felt that our workload has increased, however, with the passage of time we have become used to it and things feel normal" (IDI-16, Nurse).

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- *The stigma associated with healthcare providers working in Covid-19 wards*

Covid-19 is primarily transmitted from symptomatic people to others through direct contact, or by contact with contaminated objects and surfaces. Moreover, a large portion of those infected is asymptomatic, meaning they show no overt markers of the infection. As a result of this, frontline workers face a unique mental health challenge. Since they work in high-risk environments many opt to hide details about their work-life in fear of being stigmatized by their communities.

"I know that in some cases health care workers do not tell their families and communities that they are working with Covid-19 patients. They fear that this will cause unnecessary panic and people may view them differently" (KII-19, Associate Professor).

It is likely that this anxiety within the families and communities of health care workers is propagated by the ambiguity of information available on Covid-19. It is possible that the hospital may address many of these issues by extending its outreach services. During the interviews, a frontline worker was critical of the hospital's current outreach services:

"Our services should be extended to the community. Compared to other institutions we have not done enough. Many people have criticized us in this pandemic" (IDI-08, Pharmacist).

By providing more extensive services to surrounding communities, the hospital could not only alleviate the stigma faced by front-line workers but also reduce the surge of false information.

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Theme 2: Enablers supporting healthcare providers to deal with Covid-19 pandemic

- *A safe and secured hospital environment*

Many respondents stated that the hospital has provided a safe environment for employees and that safety measures have been improved as the hospital administration became more knowledgeable about the nature of this disease. One respondent stated the hospital's disaster management and incident command system were ensuring adequate training and smooth communication throughout the hospital.

When the number of cases started increasing, the hospital enacted the Hospital Incident Command System, leaders from each of the different areas i.e. logistics, communications, medicine, etc came together to make sure that everything was in place-. The hospital has now made smaller groups which meet regularly to go over each of the issues and an executive Operations Command Committee goes over what should be done." (KII-19, Associate Professor)

While provisions are made for the availability of PPE for the staff, many noted that implementation of proper usage of PPE and adequate hand hygiene is still a problem that requires behavioral change. It was also stated that health care providers that are considered vulnerable (i.e. elderly and/or have serious pre-existing conditions) are not allowed to work in the Covid-19 established areas.

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While several precautions are being taken, one respondent claimed that there were many places for improvement. One stated that it is complacent to feel good about any sense of safety and security and that it is important to remain vigilant in the case of new information about the disease or a high influx of patients.

"There are several places where things can slip through the cracks, and cause problems, and there are several points that will fail if they come under pressure- I am not absolutely confident, but it is good so far." (KII- 16, Professor)

- *Adequate training and drills for dealing with Covid-19 cases*

When questioned about training and drills, most respondents stated that everyone who is working for Covid-19 is trained in the usage of PPE, N95 mask, donning and doffing, and taking test samples using nasopharyngeal swabs. Many also said that regular training was being carried out on the job and at the CIME, and that master trainers were being trained to then disseminate information and train the rest of the department. Covinars (Covid Webinar) sessions are being conducted to help train and provide information about the disease.

We have completed 2-day training workshops or seminars and get trained every day in new technologies and when new guidelines come" (IDI-02, Nurse)

However, some specialists were concerned that very little had been done in the way of training; it was noted that besides guidance on the N95 mask fitting test, there were no opportunities to go through any drills. While communications were being carried out, it was not considered sufficient. Others said that while training were being conducted, they were not very regular.

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While they stated that this may be because of the social distancing measures, they insisted on more regular online training.

- *The strong hospital system of information sharing during the Covid-19 crisis*

While the outbreak of Covid-19 has put immense pressure and stress on the hospital staff, many facilitators support the hospital staff to deal with the pandemic. Respondents stated that information was being shared through video messages and that helplines and hotlines for staff and the public were effective in screening for Covid-19 symptoms. While many stated that information sharing was difficult at first, it was claimed that this was due to the changing information coming about the disease from international agencies It was reported that the hospital leadership holds weekly meetings with senior management, who then circulate that within their respective departments.

"I think we have a reasonably good system built for disaster and we have a very defined chair of command… There have been different working groups formed for Covid-19 and they all have specialized tasks for information sharing, and there is a Covid-19 hotline for employees and the public and that is adequate." (KII-16, Professor)

In addition, university-wide town hall meetings were held regularly. It was suggested that more town halls should be carried out and that regular memos should be sent with information about caring for those with the disease.

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"Town halls boosted the morale of the health care providers, and this communication was very good." (KII-3, Professor)

- *Supportive management and leadership*

Most in-depth interview participants mentioned that senior management and institutional leadership is providing immense support by ensuring appropriate provision of protective equipment (PPE) in the Covid-19 and non-Covid-19 wards to ensure the safety of frontline healthcare providers. In addition, few participants mentioned that the institutional leadership regularly visits Covid-19 units for staff appreciation and encouragement. Besides, the senior management responds to healthcare providers' concerns in a timely manner through a WhatsApp group.

"Initially, we were supposed to remain inside the patient room consecutively for 4 hours. This was very exhausting for bedside nurses especially since we have to wear three layers of PPE. We raised these concerns and senior management has now permitted us to exit the room when the patient's condition gets stable ... we now observe the patients from the mirrored door. This has given us a huge relief" (IDI-11, Nurse)

While frontline providers appreciated the support received from management and institutional leadership, they also recognized the efforts of all other support departments who are working together for the safety of frontline hospital staff. These support departments include finance, design office, construction, laundry, purchase and supply chain management, safety and

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security, human resource, information, and technology department, nutrition and food services, marketing and communications, travel services, etc.

"All the support departments are contributing in the same manner as our frontline healthcare providers" (KII-01, Professor)

In addition, the few IDI participants mentioned that institutional leadership has arranged accommodation facilities for the frontline staff who are working in Covid-19 wards but the hospital staff is not availing those services because they have their families and children back home. Few respondents further stated that the senior management has also ensured the provision of shower facilities for the frontline hospital staff; however, due to time limitations, nurses are unable to make effective use of those facilities.

Theme 3: Recommendations to support the healthcare workforce during the Covid-19 crisis.

- *Prepare and train backup health workforce*

Both IDI and KII participants mentioned that they have been experiencing staff shortages in Covid-19 wards because many of the frontline health care providers have been either quarantined or isolated due to exposure. When asked about recommendations to support the frontline health workforce, most IDI respondents suggested that healthcare providers (doctors and nurses) of other sub-specialties (neurology, cardiac, surgery, orthopedic) need to be trained as a backup to mitigate situations when entire internal medicine teams may be placed in self-

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quarantine due to Covid-19 exposure. In addition, a few key informants recommended that there should be a central backup plan for staff coverage in both Covid-19 and routine wards.

"Currently, only the healthcare providers of Covid-19 wards have received specialized training on ventilator code, BIPAP management, and handling body of expired Covid-19 patient. However, these training should be given to all healthcare staff across the institution to prepare a central backup". (IDI-03, Nurse)

- *Ensuring motivation for frontline health workforce*

To ensure enthusiasm among front liners, study respondents highlighted the need of appreciating and motivating frontline providers for their countless efforts in this pandemic battle.

Most IDIs including frontline nurses suggested that risk allowance should be given to all frontline healthcare providers involved in the treatment and management of Covid-19 patients. Healthcare providers suggested that instead of giving extra time off, hospital staff should be compensated for taking additional risks while caring for Covid-19 cases.

As you know the world is very materialistic and people always need motivation. While we are being encouraged by senior management, this form of verbal motivation will only work for a time period. If the current situation is going to go on, we will need to give people an added incentive in the form of material compensation. This can either be more money or additional days off (IDI-04, Nurse).

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In addition, respondents verbalized that some activities for staff entertainment should also be thought-about to alleviate stress and anxiety associated with this crisis situation among healthcare providers.

- *Anticipate and address the mental health needs of the health workforce*

IDI and KII respondents mentioned that there is no formal platform established where front liners' voices are being heard. Such a platform could provide an opportunity to anticipate and address the mental health needs of the frontline health workforce.

Everyone is very stressed. I see it every time one of my staff has to take care of a suspected patient, they are hesitant and scared. Sometimes, I feel the same way myself. We need an integrated counseling program. People should not just come for counseling when they are mentally struggling. Similar to how we have guidelines for PPE and social distancing we should have small group talks on ZOOM so that we can dispel our anxieties before they build up (KII 06, Associate Professor).

Few study participants particularly KIs appreciated the motivation sessions organized by psychiatric fellows on stress and coping. However, study respondents highlighted the need of arranging more psychiatric sessions for healthcare staff on a daily basis to cope with the stress. More specifically, participants stated that currently there is a blanket approach around mental health; however, more is needed to address varied concerns of the health workforce.

There was a zoom session arranged on stress management, but I was unable to attend it due to my duties. I think we need more of these sessions. We can even add more

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innovative things such as breathing exercises, mindfulness, and yoga. There is so much anxiety relating to Covid-19 both at work and in our homes. Everyone is so panicked and there is so much hype going around. These types of innovative sessions would really help (IDI-05, Doctor)

Discussion

To the best of our knowledge, this is the first study to explore perceptions and experiences of healthcare providers during the Covid-19 Pandemic in Pakistan. The research identified challenges faced by healthcare providers while managing Covid-19 patients, alongside strategies to cope with these. The frontline healthcare providers pointed out several concerns that influenced their ability and willingness to treat and manage Covid-19 patients. These included shortage of PPEs and hand sanitizers, lack of clear SOPs, ad hoc management of hospital outpatient area for Covid-19 screening and testing, violent behavior by families of Covid positive patient, and limited capacity of the hospital to treat and manage increasing Covid-19 positive patients. Notwithstanding some challenges that cannot be mitigated by the institution such as the increasing number of Covid positive patients and unexpected violent behavior of families of Covid-19 positive patients, a number of corrective actions that can be taken to lessen the impact of others.

Our results highlight, especially in the initial period of the crisis, differences in the responses received from senior management and frontline providers with regard to the availability of PPEs and sanitizers, presence of clear SOPs, preparedness of hospital to manage Covid-19 pandemic. These discrepancies could be partly due to the communication gap between the two group of respondents (whereby senior management and hospital leadership was heavily involved in the process of designing new screening and testing site, procuring PPE and

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updating SOPs considering the differential progression of the outbreak). Most have now been addressed through corrective actions by the hospital leadership during the last few weeks and months. As this is a leading private teaching hospital in the country, the senior management and hospital leadership was able to successfully address the gaps to improve the experiences of front liners involved in this pandemic. However, this may not be the case in most public sector hospitals, where front-line healthcare workers continue to face challenges. The healthcare systems in low-middle-income countries face serious constraints in capacity and accessibility during normal times. This would be aggravated during the Covid-19 outbreak, leading to worse clinical outcomes, poor quality healthcare, and poor healthcare workers' experiences[23, 24].

Consistently with experiences from previous outbreaks and emergencies[23, 25], frontline healthcare workers providing care to Covid-19 patients experienced increased anxiety and stress. Our study found that the increased exhaustion among healthcare providers is due to the fear of acquiring infection and transmitting it to their family members. Anxiety and burnout among healthcare providers were also reported by studies conducted in high income countries (HICs) although countries were combating different stages of the pandemic[23]. This may be due to standard changes in working hours, shortage in a skilled workforce, and inadequate access to PPE[23]. The frontline providers in our study felt overwhelmed due to the exhaustive donning and doffing process, intense work, and a large number of patients, which was consistent with the studies on the outbreak of MERS-Cov[26, 27] and Ebola[28]. Our results undoubtedly show that stigma is a pressing issue for the frontline healthcare workers working in Covid-19 wards. Several studies have reported that there are several potential mechanisms by which stigma could affect healthcare providers' outcomes[29, 30], and HCPs who experience higher levels of stigma reported increased physical (fatigue) and psychological

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distress (burnout)[31]. These pressures can lead to mental health problems for example burnout, anxiety, depression, insomnia, denial, anger, which not only influence frontline healthcare providers' attention, understanding, and decision-making capacity but could also have a long-lasting impact on their physical and psychological health after the Covid-19 emergency is over[7].

While the outbreak of Covid-19 put immense pressure and stress on the hospital staff, many enabling factors supported hospital staff to deal with these aspects, which have progressively evolved over the duration of the pandemic. As a result of this pandemic, the entire hospital was able to pull together and many departments across the university hospital coordinated to ensure smooth and efficient operations. Findings suggest that the respondents felt that they were actively encouraged and supported by senior management and the university leadership. More specifically, the research subjects felt that over time the safe and secured hospital environment enabled healthcare providers to perform their routine tasks and reduce their feeling of uncertainty and fear. Similar findings have been reported by the qualitative study published in Lancet Global Health by Qian Liu and colleagues[32]. Our study found that the healthcare providers were appreciative of the training provided to them regarding the use of PPE, N95 mask, donning and doffing, and taking test samples using nasopharyngeal swabs. However, it was reported that more drills could be conducted to improve their hands-on skills and reduce the risk of acquiring infection. Health workforce safety is a high priority and therefore it is essentially important to provide sufficient protective supplies and training and drills for effective management of Covid-19 cases[32]. A unique yet encouraging finding reported by our study participants was that the hospital developed a strong system of information sharing to keep faculty and staff updated about the Covid-19 situation through video messages, hotlines, town halls, and what are now called Covinars.

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Our study also reported some recommendations to mitigate current challenges and further improve the experiences of healthcare providers working in Covid-19 wards. The frontline providers caring for Covid-19 patients felt extreme physical discomfort and fatigue due to long working hours and complicated donning and doffing process and suggested that institutions should provide risk allowance to compensate healthcare providers for the additional risks they take and to motivate staff to continue to work. This finding is consistent with the previous experience from the outbreak of Ebola in western Africa, where risk allowance was adopted as a strategy for motivating and retaining healthcare workers[33]. Our study suggested preparing and cross-train a backup health workforce to effectively respond to staff shortages as many of the frontline healthcare providers have been either quarantined or isolated due to exposure. Similar recommendations have been provided by a number of studies conducted in diverse settings[34-36]. Our study also showed that a formal platform where front liners' voices could be heard did not exist. Respondents reported that such a platform could provide an opportunity to anticipate and address the mental health needs of the frontline health workforce. Experiences from similar outbreaks suggest that early psychological intervention and establishment of early support systems are particularly important for front liners to promote the emotional release and improve healthcare providers' mental health[37].

This study was conducted in a leading private tertiary care teaching hospital in Karachi, Pakistan that offers state-of-the-art healthcare. The initial challenges progressively led to a fairly successful story. The same cannot be said for a large number of public and private hospitals in the country. The shortage of PPE has been a frequent occurrence and has even led to public protests, undoubtedly contributing to mental stress and distress. The experience gained from the current study offers lessons for other hospitals in the country to benefit from.

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There is no doubt that good quality healthcare against Covid-19 can only be ensured if the frontline workers are well taken care of in terms of their mental health and physical needs when asked to serve critically ill patients round the clock.

This study provides an initial evidence base of healthcare providers' experiences of managing Covid-19 patients in an early stage of the pandemic when the participants just accepted the anti-epidemic tasks. Diverging from the findings of various studies on the experience of negative emotions and barriers encountered during the outbreak, we found that facilitators coexist with challenges, which supported front liners to effectively deal with the crisis. The findings from this study can be directly used for improving preparedness and response for possible future Covid-19 waves or other outbreaks. Future research could be conducted to perform an in-depth analysis of before-and-after pandemic conditions and their influence on healthcare providers' experiences.

Methodological Limitations: The study sample was small, particularly when considering the AKUH employs over 6300 healthcare providers, yet our study intent was to be dug into the depth of each interview to understand unique perspectives and experiences of healthcare providers regarding Covid-19. Bengtsson et al. suggest that the qualitative researcher has often to choose depth over breadth to gain a rich understanding of a phenomenon [38]. However, there remains a possibility that our sample belongs to a particular subgroup of healthcare providers who were motivated to engage with the study to inform a particular story for their Covid-19 experience. Another limitation of this study was that all study respondents were interviewed online, to minimize the risk of infection. The authors did not have the opportunity to build rapport with respondents over Zoom or obtain non-verbal cues during interviews. Due to the nature of outbreak prevention, our study was unable to conduct focus group interviews, which would have provided detailed information about personal and group feelings. Lastly,

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this was a short-term study and does not include long-term experiences of the research subjects with this pandemic.

Conclusion:

This study provides an in-depth understanding ofthe healthcare providers' experiences of the Covid-19 outbreak and emphasizes that adequate training and drills, sufficient PPE, a safe and secured hospital environment, healthcare providers motivation, supportive hospital management and leadership, strong hospital system of information sharing and psychological support to address mental health needs of front liners are necessary to improve the overall experiences of health-care providers fighting Covid-19.

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Declaration of interests

Ethics approval and consent to participate

Ethical approval for this study was obtained from the Aga Khan University Ethical Review Committee (AKU-ERC) – [2020-3694-9056]. Written informed consent was provided by all study participants. Informed consent included permission to audio record the interviews and use anonymized quotes. Voluntary participation and the right to ask any questions and to decline participation at any time were emphasized during the data collection.

Consent for publication

Written informed consent for publication was obtained.

Competing interests

We declare no competing interests.

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

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Authors' contributions

All authors had full access to all the data in this study and take responsibility for the integrity of the data and the accuracy of the data analysis. SS, SSQ, ASF, NAP, ZHA, NA designed the study. ASF supervised data collection and analysis. ASF, NAP, ZHA, MMS collected the data. ASF, NAP, ZHA, MMS, SS analyzed and interpreted the data. ASF, NAP, ZHA, MMS wrote the first draft of the manuscript. All authors contributed to reviewing and editing the manuscript.

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Annex -1

Assessing Tertiary Care Hospital's (AKU's) Readiness to Cope with Covid.19 and Future Preparedness to Manage Emergencies in Karachi, Pakistan

Key Informant Interview Guide

Basic Information

S.no	Name (Confidential)	Age	Sex	Designation	Institution	Years of experiences	Specialty
1							
2							
3							

Knowledge, attitude and perceptions

1. How do you feel about your level of knowledge regarding COVID-19?
   Probes: Spread of COVID-19, management, prevention
2. What are your perceptions about managing COVID cases at AKUH?
   Probes: Facilities for screening, testing, patient isolation, treatment and patient and family education
3. Do you have concerns with the prospect of managing/treating cases at AKUH?
   Probes: inadequate screening facilities, less testing kits, inadequate capacity of healthcare providers to manage COVID-19 cases, lack of isolation wards
4. What are you view on the safety measure currently in placed at AKUH?
5. How do you feel about being in a very responsible position, and working under tremendous pressure with COVID-19 situation?

Perceptions on Emergency Plan

1. What are your perceptions about AKUH emergency plan for dealing with COVID-19 pandemic? and also specific to your department or position.?
   Probe: Satisfaction with the hospital emergency plan, whether or all imp aspects are covered, reducing employee exposure etc/.
2. Do you feel a sense of safety for hospital staff in the hospitals emergency plans, which are currently in place?
   Probe: what can be done more, what else is needed related to your department? for young persons, old people of more than 50 years, children, pregnant women or delivering COVID-19 affected patients

Perceptions on Hospital Capacity

1. How do you feel about the AKUH capacity to deal with COVID-19 patients?

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Probes: access to required equipment/ resources

2. What are some of the barriers that hospital staff face while caring for COVID-19 cases?
3. How these barriers could be handled efficiently, in spite of limited resources at AKUH?
4. Do you think that your service domain/ specialty is prepared to manage COVID-19 affected patients?
   Probes: if yes how, if no why?
5. In your opinion, what precautions should be acquired for carrying out a routine procedure such as in ER surgeries, intubation, delivery care, C-section planned or otherwise
6. At AKUH, what are the facilitators, that provided support to deal with COVID-19 situation?
   Probes: Trainings, drills, PPEs availability, management support, etc.
7. Based on your experience on COVID-19, what are your suggestions to improve hospital's capacity to manage COVID-19

Training and Drills

1. How should nurses be trained/doctors be trained? Should this training be specialty specific or some forms of basic training to all staff?
2. In your opinion, are sufficient training and drills provided to the healthcare providers for dealing with this emergency?
3. What aspects were covered in the training?
   Probes: medical treatment procedures, personal protective measures, information system management, disinfection and sterilization and principles of quarantine and isolation

Information sharing for crisis communication

1. What are your thoughts on the hospitals system of information sharing for crisis communication?
2. In your opinion, what special arrangements have been made at AKUH to facilitate information sharing for crisis communication
   Probes: COVID Hotline for staff, COVID helpline for public

Future Preparedness

1. In your opinion, what are the needs for future preparedness for any outbreak or natural disaster for AKUH?
   Probes: staff trainings, special wards, equipment, protective gears, emergency drills, etc.

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Annex-2

Assessing Tertiary Care Hospital's (AKU's) Readiness to Cope with COVIDCOVID.19 and Future Preparedness to Manage Emergencies in Karachi, Pakistan

In-Depth Interview Guide

Basic Information

S.no	Name (Confidential)	Age	Sex	Designation	Institution	Years of experiences	Specialty/Ward
1							
2							
3							

Knowledge, attitude and practice

1. How do you feel about your level of knowledge regarding COVID-19?
   Probes: Spread of COVID-19, management, prevention
2. What are your perceptions about managing COVID cases at AKUH?
   Probes: Facilities for screening, testing, patient isolation, treatment and patient and family education
3. Do you have concerns with the prospect of managing/treating cases at AKUH?
   Probes: inadequate screening facilities, less testing kits, inadequate capacity of healthcare providers to manage COVID-19 cases, lack of isolation wards
4. What are you view on the safety measure currently in placed at AKUH?
5. Are you using PPE while caring for COVID-19 cases, as guided during the trainings?

Perceptions on Hospital Emergency Plan for COVID-19

1. What are your perceptions about AKUH emergency plan for dealing with COVID-19 pandemic?
   Probe: Were you briefed on the emergency plan for COVID-19 - by whom, when, any refreshers given?
2. Do you feel a sense of safety in the hospital's emergency plan, which are currently in place?
   Probe: for your safety, healthcare providers' safety, family members' safety

Training and Drills

1. Were you provided with sufficient trainings and drills for dealing with this emergency?
   Probes: satisfaction with training (content, duration, etc.),
2. What aspects were covered in the training?

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Probes: medical treatment procedures, personal protective measures, information system management, disinfection and sterilization and principles of quarantine and isolation

Perceptions on Hospital Capacity

1. How do you feel about the AKUH capacity to deal with COVID-19 patients?
   Probes: access to required equipment/ resources
2. What are some of the barriers that hospital staff face while caring for COVID-19 cases?
3. How these barriers could be handled efficiently, in spite of limited resources at AKUH?
4. Do you think your service domain/ specialty is prepared to manage COVID-19 affected patients?
   Probes: if yes how, if no why?
5. In your opinion, what precautions should be acquired for carrying out a routine procedure such as in ER surgeries, intubation, delivery care, C-section planned or otherwise
6. At AKUH, what are the facilitators, that provided support to deal with COVID-19 situation?
   Probes: Trainings, drills, PPEs availability, management support, etc.

Information sharing for crisis communication

1. What are your thoughts on the hospitals system of information sharing for crisis communication?
   Probes: Are you getting the information that you need?
2. Do you feel like you are able to talk about your concerns?
   Probes: through hotline for employees

Stress & coping

1. How do you feel about working under tremendous pressure with COVID -19 situation?
   Probes: working at odd hours, weekends in addition to routine responsibilities, wearing PPEs for long periods
2. What kind of relief you look for yourself to manage with these pressures?
   Probes: compensation/overtime, sufficient PPEs, adequate rest periods, etc.
3. Can you share some of your apprehensions while dealing with COVID -19 suspected or positive patient's?
   Probes: Family members/ colleagues getting infected?
4. How do you cope with anxiety and fear related to managing COVID-19 inpatients?
   Probes: Coping strategies
5. Do you have suggestions on how institution could provide support services for coping with stress related to this crisis situations?

Future Preparedness

1. In your opinion, what are the needs for future preparedness for any outbreak or natural disaster for AKUH?
   Probes: staff trainings, special wards, equipment, protective gears, emergency drills, etc.

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Standards for Reporting Qualitative Research (SRQR)*

http://www.equator-network.org/reporting-guidelines/srqr/

	Page/line no(s).
Title and abstract	
Title - Concise description of the nature and topic of the study Identifying the study as qualitative or indicating the approach (e.g., ethnography, grounded theory) or data collection methods (e.g., interview, focus group) is recommended	Pape no. 1/line no. 2-3
Abstract - Summary of key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results, and conclusions	Pape no. 2-3/line no. 27-52
Introduction	
Problem formulation - Description and significance of the problem/phenomenon studied; review of relevant theory and empirical work; problem statement	Pape no. 4-5/line no. 66-98
Purpose or research question - Purpose of the study and specific objectives or questions	Pape no. 4-5/line no. 100-107
Methods	
Qualitative approach and research paradigm - Qualitative approach (e.g., ethnography, grounded theory, case study, phenomenology, narrative research) and guiding theory if appropriate; identifying the research paradigm (e.g., postpositivist, constructivist/ interpretivist) is also recommended; rationale**	Pape no. 5/line no. 109-111
Researcher characteristics and reflexivity - Researchers' characteristics that may influence the research, including personal attributes, qualifications/experience, relationship with participants, assumptions, and/or presuppositions; potential or actual interaction between researchers' characteristics and the research questions, approach, methods, results, and/or transferability	Pape no. 5/line no. 109-111
Context - Setting/site and salient contextual factors; rationale**	Pape no. 5/line no. 109-112
Sampling strategy - How and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g., sampling saturation); rationale**	Pape no. 5-6/line no. 109-120
Ethical issues pertaining to human subjects - Documentation of approval by an appropriate ethics review board and participant consent, or explanation for lack thereof; other confidentiality and data security issues	Pape no. 9/line no. 173-175
Data collection methods - Types of data collected; details of data collection procedures including (as appropriate) start and stop dates of data collection and analysis, iterative process, triangulation of sources/methods, and modification of procedures in response to evolving study findings; rationale**	Pape no. 5-7/line no. 114-147

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Data collection instruments and technologies - Description of instruments (e.g., interview guides, questionnaires) and devices (e.g., audio recorders) used for data collection; if/how the instrument(s) changed over the course of the study	Pape no. 6/line no. 123
Units of study - Number and relevant characteristics of participants, documents, or events included in the study; level of participation (could be reported in results)	Pape no. 9-10/line no. 188-192
Data processing - Methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding, and anonymization/de-identification of excerpts	Pape no. 7/line no. 148-160
Data analysis - Process by which inferences, themes, etc., were identified and developed, including the researchers involved in data analysis; usually references a specific paradigm or approach; rationale**	Pape no. 7/line no. 148-160
Techniques to enhance trustworthiness - Techniques to enhance trustworthiness and credibility of data analysis (e.g., member checking, audit trail, triangulation); rationale**	Pape no. 7-8/line no. 161-171

Results/findings

Synthesis and interpretation - Main findings (e.g., interpretations, inferences, and themes); might include development of a theory or model, or integration with prior research or theory	Pape no. 11-23/line no. 200-479
Links to empirical data - Evidence (e.g., quotes, field notes, text excerpts, photographs) to substantiate analytic findings	Pape no. 11-23/line no. 200-479

Discussion

Integration with prior work, implications, transferability, and contribution(s) to the field - Short summary of main findings; explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application/generalizability; identification of unique contribution(s) to scholarship in a discipline or field	Pape no. 23-27/line no. 480-582
Limitations - Trustworthiness and limitations of findings	Pape no. 28/line no. 589-602

Other

Conflicts of interest - Potential sources of influence or perceived influence on study conduct and conclusions; how these were managed	Pape no. 29/line no. 622
Funding - Sources of funding and other support; role of funders in data collection, interpretation, and reporting	Pape no. 29/line no. 627

*The authors created the SRQR by searching the literature to identify guidelines, reporting standards, and critical appraisal criteria for qualitative research; reviewing the reference lists of retrieved sources; and contacting experts to gain feedback. The SRQR aims to improve the transparency of all aspects of qualitative research by providing clear standards for reporting qualitative research.

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**The rationale should briefly discuss the justification for choosing that theory, approach, method, or technique rather than other options available, the assumptions and limitations implicit in those choices, and how those choices influence study conclusions and transferability. As appropriate, the rationale for several items might be discussed together.

Reference:

O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. **Standards for reporting qualitative research: a synthesis of recommendations.** *Academic Medicine*, Vol. 89, No. 9 / Sept 2014
DOI: 10.1097/ACM.0000000000000388

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