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Coronavirus Pandemic

Experience of physicians during COVID-19 in a developing country: a qualitative study of Pakistan

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Abstract

COVID-19 spread rapidly and jeopardised the physicians with not only treatment but also with limited resources and new working style. This study aimed to investigate the experience of physicians in Pakistan as frontline workers for the treatment of COVID-19 patients. The study employed a qualitative design and used Haas's adaptation of Colaizzi method for analysis. The respondents for the interview were selected based on purposive sampling and only those physicians were contacted who were treating COVID-19 patients in Lahore, Pakistan. The results of the study revealed many challenges faced by Pakistani physicians which included physical and psychological stress due to the treatment of COVID-19 patients. Moreover, infrastructural flaws have added in the vulnerabilities of the physicians. In developing countries, the fight is much harder for physicians as evidenced by their first-hand experience. The policymakers in developing countries especially in Pakistan can direct policies facilitating physicians to reduce their physical and psychological stress as well as increasing resources for the treatment of COVID-19 patients.

Key words: Physicians; experience; COVID-19; stress; developing; qualitative.

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Introduction

COVID-19 spread rapidly, and infected people across the globe. Until the 13 July, 2020 around 13 million people have been infected people with this virus in 213 countries [1]. The control of the spread of this virus has jeopardised every country depending on their resources and health infrastructure. Healthcare providers in developing countries are facing many problems while fighting with the disease. Taking Pakistan as a case of a developing country: it is a middle-income country, located in the South Asian region between China and Iran and shares its border with India as well. It is also struggling to fight with the disease and its spread. As of 13 July 2020, the number of confirmed cases in Pakistan are 240,175, and there are 5,266 reported deaths [2]. The disease has put tremendous pressure on the health care system, especially in Pakistan, because of scarce resources. According to Government of Pakistan [3], in 2019, Pakistan had 233,261 registered physicians and 112,123 nurses working in different hospitals and health units available for serving more than 200 million population. The government's expenditure on health in 2019 was 1.1% of the Gross Domestic Product. Pakistan has a meagre health infrastructure with insufficient expenditure focus from government, and the pandemic has put tremendous pressure on the healthcare system. After pandemic, the government has specifically shifted its focus towards health.

Healthcare providers are playing a very critical role in this pandemic. They are an essential resource for any country. In developing countries such as in Pakistan, where the healthcare system is not lavishly established, and resources are scarce, the safety and protection of healthcare workers become of the utmost importance. Past studies have shown that the healthcare providers working with Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS) faced stress, risk of infection, understaffing, stigmatisation, and lack of support [4,5]. It is also hard now for frontline physicians, who have no infection and are treating COVID-19 patients to adjust in a stressful environment with the constant threat of infection. It is essential to know the experience of frontline workers so

that the appropriate strategies and policies can be made to improve health care workers experience and eventually, the health care system. To our knowledge, we find very few studies on healthcare providers experience in developing countries [6-8]. We searched Google Scholar, PubMed and ScienceDirect with the keywords: "COVID-19" or "coronavirus disease" or "novel coronavirus" and "health-care providers" or "health-care professional" or "medical workers" or "medical staff" or "doctors" or "physicians" and "developing countries" or "Pakistan". We did not find any article on Pakistan similar to our study (search date: January 1, 2020). This study aims to qualitatively study the problems and challenges faced by physicians during their experience of treating COVID-19 patients, and for that purpose, we have taken the case of Pakistan. Where public health is the utmost priority of the government now, it is also important to know the experience of healthcare providers to understand the challenges faced by them. It will also be imperative to understand how healthcare providers in developing countries are struggling with the disease so that appropriate policies can be made to strengthen the health care system covering health care providers as well.

Overall, this study offered a picture of ground realities faced by the physicians on a day-to-day basis. This study highlights the challenges faced by the physicians which if solved can not only improve the experience of the physicians but will also improve the treatment of COVID-19 patients. The themes reported in this study can be further researched through other research methods such as structured interviews and surveys. The policymakers can benefit from the findings of this study to formulate relevant policies for improvement in the health infrastructure. This study is also an important contribution to the literature which can be replicated methodologically as well as in other countries to investigate the experience and provide a comparative analysis.

Methodology

Study design and sampling

We conducted a qualitative study in Pakistan. The study was based on telephonic interviews. The interview was open-ended but broadly the purpose of interview questions was to identify the COVID-19 related experience, risks, and suggestions. The participants for this study were selected based on purposive sampling. The inclusion criteria for the participants in the study was the experience of work with critically ill COVID-19 patients and sufficiently available for interview. Physicians who were treating or treated the COVID-19 patients were approached for the interview. Five participants were known to the interviewer, and rest were approached through snowball sampling. Respondents varied in age, gender, marital status, and experience. These respondents belonged to the hospitals of Lahore which is one of the developed cities of Pakistan. Lahore is one of the main urban cities of Pakistan and tax revenue generated by the residents make 15% of the country's gross domestic product [9]. There are more than 54 government hospitals but only a few are fully equipped. A population of 9 million of Lahore face a deficiency of health facilities [10]. The city has several hospitals which are also approached by residents of neighbouring areas. Nonetheless, as mentioned earlier, due to minimal health expenditure by the government, the rural areas do not have sufficient healthcare units and fully functional hospitals. The respondents of this study gave their consent to participate in the study. The sample size was determined through data saturation (to the point where no new theme emerges in the data). The method of determination of sample size from the method of thematic saturation is based on literature [11,12]. Before data collection, ethics approval was sought from the hospital administration.

Data collection

The interviews were conducted during May-June 2020 on the availability of the physicians for the interview. The data was collected at a time convenient for the participants on the telephone. The responses were recorded and later transcribed by two researchers of this study.

Data Analysis

Colaizzi's method [13,14] to interpret qualitative data is a commonly used technique. For this study, the researchers followed Haas's adaptation of Colaizzi method [15]. The interviews were read several times to gain understanding. The statements from the respondents were converted into general understandable phrases. These phrases were then combined and organised into relevant clusters and themes. The themes which were extracted were analysed in detail to identify the challenges and problems faced by the physicians in Pakistan.

There can be arousal of the potential issue of credibility when a transcription is converted into broader themes. To address the credibility concern, each researcher of this study, individually read and extracted phrases, categories, and themes following Colaizzi method. The results were then compared to

Table 1. Demographic characteristics of the participants.

Identification code of physician	Gender	Age	Marital status	Employment experience
1	Female	32	Single	3rd year resident
2	Female	30	Single	2nd year resident
3	Male	35	Married	3rd year resident
4	Male	38	Married	3 years
5	Male	37	Married	2 years
6	Male	40	Married	4 years
7	Female	35	Married	3rd year resident
8	Male	34	Married	2nd year resident

The experience was counted after completion of their residency (specialisation). Residents are doing their specialisation in particular field and are registered physicians. All physicians originally belonged to anaesthesia department of public hospitals and treated COVID-19 patients in ICUs who were critically ill.

identify any discrepancies in the data analysis. Finally, after many discussions on the themes extracted, the researchers agreed on the results presented in Table 1 and 2, respectively.

Results

The sample of this study consisted of 8 physicians from COVID-19 dedicated hospitals located in Lahore, Pakistan. All the participants included in this study were physicians and were directly engaged with COVID-19 patients. They were on duty alternatively from May to June 2020. Thematic redundancy was accomplished after the fifth interview; however, to confirm the redundancy, three more interviews were conducted. In general, the interviews lasted for about 20-30 minutes. The demographic characteristics of the participants are presented in Table 1.

While analysing the physicians' responses, three significant themes emerged, namely lack of infrastructure, physical and psychological stress. The challenges were mainly associated with insufficient infrastructure. Due to lack of infrastructure, the health workers faced physical as well as psychological stress. The physicians also floated suggestions deduced from their first-hand experience of dealing with COVID-19. The fundamental problem in infrastructure, which is reported by interviewees, is lack of proper air conditioning and rest areas. It is due to old buildings with old installations, which are damaged over the years. About the infrastructure problems faced by the physicians in Pakistan, they are facing problems with the availability of equipment required to treat the COVID-19 patients. The COVID-19 positive patients need dedicated equipment as they get infected and cannot be used for regular patients. An interviewee said, "right now facilities that are not available in our healthcare system is CRT (Continuous renal replacement therapy) haemodialysis (blood circulation) … that I feel during working in covered ICU…" (D7). It seems there is hope in the gloomy environment of problems faced by the physician associated with COVID-19.

In the developed world, hospital administrations provide healthcare staff with excellent infrastructure to

Table 2. Themes categories (Challenges).

1. Infrastructure
A. Absence of proper air-conditioning/ventilation
B. Unavailability of quality rest areas for the staff (especially physicians and nurses)
C. Lack of specialised equipment to treat COVID-19 patients
D. Lack of understanding in the supporting staff related to COVID-19
E. The availability and quality of protective gear provided to the healthcare providers
F. Monitoring and management of the procedures related to dealing with COVID-19 patient
G. Limited testing capacity and handling for COVID-19
2. Physical Stress
A. Work overload due to lack of COVID-19 training
B. Dehydration and fatigue caused by the constant wearing of PPE
3. Psychological Stress
A. Fear of COVID-19 contraction
B. Fear of being a source of infection for the family
C. Fatigue and depression due to hectic working hours
D. Others not following the standard operating procedures (SOP's) provided by the governing body
E. Lack of coordination among the hospital staff
F. Hurdles in communication with the COVID-19 patients
G. Post-ICU depression

rest and regain strength. However, in the developing world like Pakistan, there is a dearth of facilities for the hospital staff, especially in the hospitals owned and administered by the government. Sufficient rest and sleep lead to a better immune system [16]. It is increasingly important during a pandemic. The physicians complained about lack of sufficient spaces to rest and regain strength. It illustrates another infrastructural flaw in Pakistani hospitals. One of the interviewees responded to the problems faced with much frustration as "we are facing lack of donning and doffing area and lack of office for sitting…" (D1). The interviewee said, "in our Intensive care Units (ICUs) the air conditioning system is not very good, so a person sweats a lot and sometimes nausea feeling is felt…." (D7). The reduced availability of this primary facility can lead to deteriorating health of the frontline workers. The interviewee said, "in our Intensive care Units (ICUs) the air conditioning system is not very good, so a person sweats a lot and sometimes nausea feeling is felt…." (D7). The reduced availability of this primary facility can lead to deteriorating health of the frontline workers. If they are not in good health, they will not be able to provide care for the affected. Moreover, the physician to patient ratio is also one of the lowest in the world [17]. It adds more to the preciousness of the health workers at the outburst of a pandemic.

World health organisation (WHO) has defined supporting staff as those people that are directly engaged in health-enhancing activities [18]. As mentioned earlier in the discussion, the supporting staff for the physicians is inadequate. It created hurdles for physicians to perform their duty at an optimum level. Another problem associated with the supporting staff is insufficient training regarding COVID-19 management. One of the interviewees quoted, "As I was talking about earlier, our supporting staff is lagging in education and understanding…" (D2). The physicians have to simultaneously train and educate the supporting staff along with managing COVID-19 patients.

Another problem is that the PPE provided to the staff, and the physicians in some hospitals are of sub-standard quality. The material is damaged quickly. The lack of PPE quality adds to the mental pressure of physicians because they are then gravely concerned for their families. An interviewee says, "…in ICU we are facing a bit of problem with PPE like we did not have the proper size of PPE. Its quality was not that good, whenever we wear, it mostly tears…" (D3). Another physician says, "… many physicians have been infected because the quality of PPE is not very good…" (D4). The physicians remain in constant fear and stress, whether they are safe or not.

The physicians fear that they may spread COVID-19 in the community as well as in their families, being a carrier of the virus. This fear is at supreme levels in the physicians who manage critical COVID-19 patients admitted in the ICU. One of the physicians expressed his concern in these words, "…COVID-ICU is a constant stress for us in a way that we have to take care of family first keeping ourselves as second..." (D5). Another respondent said, "what are the risks … obviously the risk of being infected and giving this infection to our loved ones…" (D2).

The physicians are also concerned with the Standard Operating Procedures for COVID-19. The hospital administrations must test entire staffs to rule out any asymptomatic person in the hospital, especially in the ICUs. The physicians are also anxious about the handling of COVID-19 patients' blood samples to be sent to the labs. The samples are not managed appropriately by the staff. In the words of a physician, "Currently, the issues we face is that in normal ICU, the documented work or sending samples were done casually by the staff but now if we have to send any sample of COVID-19 patient to the lab then we cannot do it casually. We need proper containers for sending them…" (D5). The hospitals have not made any strict procedures and monitoring about the management of the procedures related to the handling of COVID-19 patients, their blood sample.

All the infrastructural flaws have contributed to the physical as well as psychological stress to the physicians in Pakistan. Physical stress is accumulated in the physicians due to sub-standard quality of PPE suits, long working hours, inadequate supporting staff, and absence of other facilities; the physicians are physically exhausted. Even where all the facilities are

Table 3. Suggestions from the Physicians.

1. For masses	
A.	Strictly follow SOP's
B.	Help the governing bodies to spread the awareness
2. For hospital administration	
A.	Formulation of a multidisciplinary team to assist in COVID-19 treatment
B.	Dedicated space for physicians and helping staff for rest
C.	Better management of physicians and patients at the hospital who are COVID-19 positive

at par, the physicians feel dehydration and fatigue due to the constant wearing of PPE. One of the physicians mention, "PPE ...ah…which leads to dehydration...".

The paucity of rest has added physical stress. Subsequently, it has triggered psychological stress in most of the physicians that participated in this study. The fear of contracting virus was dominant in all the physicians that were part of this qualitative study. One of the interviewees says, "… if we compare COVID ICU with normal ICU, the environment gets very much different. One's personal fears while thinking about the disease arises as the transmission of the disease is totally aerosol generated….". The physicians in Pakistan are entirely committed towards their best contribution to curb the virus. Instead of personal fear to contract virus, fear for the family dominated and added to the phycological stress in the physicians.

Another interviewee resonated with the fear for family, "Other risks are going back home and meeting with the family and there is increased risk of transmitting the virus…." Similarly, another respondent stressed upon the fear of being a source of COVID-19 to their loved ones in these words, "…obviously the risk of being infected and giving this infection to our loved ones…." However, not all the physicians dealing with COVID-19 are fearful, rather they are excited about being able to contribute to treating pandemic hit patients. Nonetheless, the physician's families remain fearful because they certainly know that they are at the frontline of COVID-19 exposure.

On top of fear, the physicians had to face stress about the administrative duties in the hospital. The duties are burdening because the supporting staff as well as the masses are not following standard operating procedures defined by the government. To illustrate, the physician quoted, "…our population does not follow SOPs and we're moving on a time bomb and all of a sudden, the patients can increase…". The vulnerability of the population, lack of education and infrastructure has been the source of depression in the physicians. One of the physicians stated that "The other problem is we are facing is actually the staff which is very much untrained. As you all know we are third world country and we don't have a facility to train our staff. They are not that trained, and they are very highly exposed to patients…" It makes the hospital environment stressful for the administration, in general, to deal with the pandemic.

Moreover, the patients are also fearful of the societal stigma, and they also fear the concept of isolation. A physician stated the first-hand experience in these words, "…COVID-19 is a social stigma and patients who come with moderate symptoms are more fearful about the outcome and basically social isolation…." These fear in the patients create hurdles for the physicians, to make them understand about the basic procedure related to COVID-19. The physicians as well as the supporting staff has to work at an extra length to make patients comfortable and make them understand that isolation is beneficial for all the associated stakeholders.

The environment in the ICUs is most stressful for the physicians in normal circumstances due to the critical condition of the patients admitted. In the time of COVID-19 pandemic, the COVID-19 patients admitted to ICU has added to the psychological stress in the physicians. One of the interviewees described COVID-ICU experience as "…COVID ICU was our first time. We have been dealing with other ICUs. As the disease was new, many things were new for us. If we compare COVID ICU with normal ICU, the environment gets very much different… COVID-ICU is a constant stress for us in a way that we have to take care of family keeping our self-second….".

Pakistan has a large population as mentioned earlier. The carelessness in following SOPs and high density of population made the spread of COVID-19 easier. This has caused a huge burden on physicians in Pakistan. In a nutshell, the physicians in Pakistan have to work with the limited tangible as well as intangible resources to restrain and to treat COVID-19 patients. Table 2 presents the summary of challenges identified by the physicians, through Colaizzi's method.

Being at the frontline of the COVID-19 situation, the Pakistani physicians have floated several suggestions to overcome the current problems faced by them (refer to Table 3). First and foremost, they have pleaded to the population, to follow standard protocols of social distancing properly. So far, the only way to curb COVID-19 is social distancing and to follow SOP's all the time. It will help the governing bodies to mitigate the impact of COVID-19. Furthermore, the Pakistani physicians suggested formulation of multidisciplinary teams to assist in COVID-19 treatment because we are yet to fully understand how COVID-19 behaves inside and outside of the human body. The multidisciplinary teams will be much more capable of handling positive COVID-19 physicians and patients. The physicians should have separate spaces where they can securely remove PPEs and get disinfected. Due to poor infrastructure, doctors face such difficulties. The operating procedures in the hospitals should be made and followed to properly

handle COVID-19 patients to mitigate the risk of others getting infected.

Discussion

In this pandemic, physicians are playing a critical role and taking much burden. In Pakistan where the health expenditure is low, the public healthcare system is not well established, and the density of registered physicians per 10,000 population is not appreciable [19], physicians have made a tremendous effort to control the disease. According to the Government of Pakistan, the national security was already threatened due to population growth, environmental pollution, rapid urbanisation and change in the living style of the masses. The COVID-19 has put further direct and indirect pressures on the healthcare system posing health risks to the vulnerable population with the inadequate healthcare system and infrastructure [3]. Amidst all these vulnerabilities, physicians have tried their level best to control the infection caused by COVID-19 in addition to managing other diseases in Pakistan. Although Physicians were stressed, fatigued, and overworked while dealing with COVID-19. They were fearful of catching the disease and infecting others. This finding is in agreement with another study conducted in China [6]. The fear of catching and infecting the disease was also found by another study in Iran [8]. As a mention, Pakistan's population health status is also not very appreciable with the presence of high stunting, child and maternal mortality rates and other infectious diseases as well [20]. Physicians also faced a lack of specialized equipment while treating COVID-19 patients. Another study also found the same finding [8]. The reason was unpreparedness for this pandemic.

Physicians have mentioned the inadequate knowledge and attitude of their staff and negligence of using Standard Operating Procedures while handling COVID-19 patients. The confusion of the staff to follow the procedures is also due to working in a completely new environment [6]. Particular donning and doffing areas have not been made for physicians going to ICU. The conventional management procedures have not been evolved to deal with COVID-19. The quality of healthcare is often deficient in developing countries. The quality of care does not necessarily lack compassion or resources, but it is also due to the gap of knowledge [21] and the inability of organisations to change [22]. The healthcare systems fail to measure their clinical practices which can help in quality improvement of health [23].

Physicians are also facing the problems of PPE. The airborne COVID-19 needs special protection for avoiding contraction of the infection [24]. The problem of PPE is present worldwide [25] as well as in Pakistan [26]. PPE is vital to prevent physicians from infection, and they can keep helping to control the infection. The unavailability and poor quality also give stress to the physicians, which is not suitable for their health. Stress can affect the sleep and mental health of physicians ad eventually their immune system and general health [24]. The problems reported by physicians are genuine, which need to be taken care while making policies such as providing proper infrastructure and specialised protection equipment and taking care of the mental and physical health of physicians.

Conclusions

During this pandemic, the physicians have put their lives at risk and helped the world to fight against the infection [27]. In developing countries, the fight is much harder for physicians as we can see from their first-hand experience that they are stressed, exhausted, fearful of carrying the infection to their homes and anxious of not getting exposed to the virus. PPE if available, still adds to the trouble as wearing PPE for extended duty hours is still not easy, especially when they cannot change or remove it safely in separate donning and doffing areas. The knowledge gap of the physicians and staff and the novel coronavirus itself is troublesome for physicians. They have to educate their staff along with insufficient resources, infrastructural deficiencies, and weak management. In addition to procuring equipment and increasing the capacity of hospitals, public health policy should also focus on the wellbeing of doctors and the skill development of the staff.

Practical Implications

This paper has practical implications for the policymakers of the health sector in developing countries and Pakistan, specifically. There is a need to increase the focus on the development of health infrastructure and system, especially when more outbreaks are predicted for the future. Physicians should also be facilitated with isolation areas where they can stay for some days if they feel that they are infected during duty instead of bringing it to their homes. Where they mostly are responsible for taking care of their parents and live with them. They can introduce make and shift infrastructure to replace the long-term infrastructural development programs to facilitate the physicians as well as the patients.

Moreover, they can formulate short-term policies to facilitate the physicians; for example, they can recruit more physicians so that physical stress is reduced. A massive campaign needs to be launched to aware and bring a behavioural change in the general masses. The policymakers must make compulsory the wearing of face masks in the public areas. The countries that successfully managed COVID-19 crisis was able to do so because of the collaboration of masses to follow all the safety precautions and standard operating procedures.

References

1. Organization WHO (2020) Coronavirus disease 2019 (COVID-19): Situation Report-178. Switzerland. Available: https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200716-covid-19-sitrep178.pdf?sfvrsn=28ee165b_2. Accessed 11 May 2020.
2. Ministry of National Institute of Health (2020). Islamabad, Pakistan. Available: https://www.nih.org.pk/. Accessed 5 June 2020.
3. Government of Pakistan (2019) Pakistan Economic Survey 2018-19. Available: http://www.finance.gov.pk/survey/chapters_19/Economic_Survey_2018_19.pdf. Accessed 2 July 2020.
4. Maunder R, Hunter J, Vincent L, Bennett J, Peladeau N, Leszcz M, Sadavoy J, Verhaeghe LM, Steinberg R, Mazzulli T (2003) The immediate psychological and occupational impact of the 2003 SARS outbreak in a teaching hospital. Cmaj, 168: 1245-1251.
5. Lee SM, Kang WS, Cho A-R, Kim T, Park JK (2018) Psychological impact of the 2015 MERS outbreak on hospital workers and quarantined hemodialysis patients. Comprehensive Psychiatry 87: 123-127.
6. Liu Q, Luo D, Haase JE, Guo Q, Wang XQ, Liu S, Yang BX (2020) The experiences of health-care providers during the COVID-19 crisis in China: a qualitative study. Lancet Glob Health 8: e7990-e798.
7. Zhang Y, Wei L, Li H, Pan Y, Wang J, Li Q, Wu Q, Wei H (2020) The Psychological Change Process of Frontline Nurses Caring for Patients with COVID-19 during Its Outbreak. Issues in Mental Health Nurs 41: 525-530.
8. Karimi Z, Fereidouni Z, Behnammoghadam M, Alimohammadi N, Mousavizadeh A, Salehi T, Mirzaee MS, Mirzaee S (2020) The lived experience of nurses caring for patients with COVID-19 in Iran: a phenomenological study. Risk Manag Healthc Policy 13: 1271-1278.
9. Annual Status of Education Report (ASER) (2020) Annual status of education report. Lahore, Pakistan. Available: http://aserpakistan.org/document/aser/2019/reports/national/ASER_National_Urban_2019.pdf. Accessed 5 July 2020.
10. Rana IA, Bhatti SS (2018) Lahore, Pakistan–Urbanization challenges and opportunities. Cities 72: 348-355. doi: 10.1016/j.cities.2017.09.014.
11. Fusch PI, Ness LR (2015) Are we there yet? Data saturation in qualitative research. The qualitative report 20: 1408-1416. Available: https://nsuworks.nova.edu/tqr/vol20/iss9/3/. Accessed 11 December 2020.
12. Guest G, Bunce A, Johnson L (2006) How Many Interviews Are Enough?: An Experiment with Data Saturation and Variability. Field Methods 18: 59-82. doi: 10.1177%2F1525822X05279903.
13. Morrow R, Rodriguez A, King N (2015) Colaizzi's descriptive phenomenological method. Psychol 28: 643-644.
14. Colaizzi PF (1978) Psychological research as the phenomenologist views it. In: Valle RS, King M, eds. Existential-Phenomenological Alternatives for Psychology: Oxford University Press.
15. Haase JE (1987) Components of courage in chronically ill adolescents: a phenomenological study. ANS Adv Nur Sci 9: 64-80.
16. Besedovsky L, Lange T, Born J (2012) Sleep and immune function. Pflügers Arch 463: 121-137.
17. Sommerstein R, Fux CA, Vuichard-Gysin D, Abbas M, Marschall J, Balmelli C, Troillet N, Harbarth S, Schlegel M, Widmer A (2020) Risk of SARS-CoV-2 transmission by aerosols, the rational use of masks, and protection of healthcare workers from COVID-19. Antimicrob Resist Infect Control 9: 100.
18. Khalid F, Abbasi AN (2018) Challenges faced by Pakistani healthcare system: Clinician's perspective. 28: 899-901. Available: https://ecommons.aku.edu/cgi/viewcontent.cgi?article=1065&context=pakistan_fhs_mc_radiat_oncol. Accessed 6 December 2020.
19. UNICEF (2018) UNICEF Global Annual Results Report: Health, 2018. Available: https://www.unicef.org/reports/global-annual-results-2018. Accessed 1 June 2020.
20. Murray CJ, Frenk J (2000) A framework for assessing the performance of health systems. Bull World Health Organ 78: 717-731.
21. Berwick DM (1989) Continuous improvement as an ideal in health care. N Engl J Med 320: 53-56.
22. John P, Tauiwalo M, Robalino D, Frenk J (2004) Improving the Quality of Care in Developing Countries. In: Jamison DT, Breman JG, Measham AR, Alleyne G, Claeson M, Evans BD, Jha P, Mills A, Musgrove P, eds. Disease Control Priorities in Developing Countries. Washington (DC): The International Bank for Reconstruction and Development Oxford University Press.
23. Unadkat S, Farquhar M (2020) Doctors' wellbeing: self-care during the covid-19 pandemic. BMJ 368: m1150.
24. Ranney ML, Griffeth V, Jha AK (2020) Critical supply shortages—the need for ventilators and personal protective equipment during the Covid-19 pandemic. N Engl J Med 382: e41.
25. Ali S, Noreen S, Farooq I, Bugshan A, Vohra F - Risk Assessment of Healthcare Workers at the Frontline against COVID-19. Pak J Med Sci 36 (COVID19-S4): S99-S103
26. Liu Q, Luo D, Haase JE, Guo Q, Wang XQ, Liu S, Xia L, Liu Z, Yang J, Yang BX (2020) The experiences of health-care providers during the COVID-19 crisis in China: a qualitative study. Lancet Glob Health 8: e790-e798.

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