HEALTHCARE WORKERS KNOWLEDGE, PRACTICES AND STRESS LEVEL AMID COVID-19 PANDEMIC

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ABSTRACT

Objective: To evaluate the knowledge, practicesand stress level of Healthcare workers amid COVID-19 pandemic.
Study Design: Cross sectional study.
Place and Duration of Study: Various hospitals and institutes of Pakistan, from Apr 2020 May 2020.
Methodology: The study was conducted for a period of One month amongst healthcare workers of Pakistan. After taking an approval from Ethical and Review Committee, a well-structured questionnaire, consisted of 18 questions was constructed and validated. It had two sections; Demography and responses covering knowledge, practices and stress level assessment of healthcare workers. The Perceived stress score 10 (PSS-10) was used to assess the stresslevels. The Questionnaire was uploaded at www.surveys. google.com and the link was distributed through e-mailandshared on social media. SPSS version-25 was used for statistical analysis.
Results: Majority of the healthcare workers (75%) had sufficient knowledge of COVID-19 presentation, progression and basic precautionary measures. 64.65% were following basic preventive protocols to combat COVID-19. Perceived stress scale scores were 29.93 indicating high stress-level amongst healthcare workers. Moreover, when perceived stress scale score was correlated with gender and different age groups a significant difference (p=0.04) and (p<0.001) were found.
Conclusion: Despite of having adequate knowledge and practices levels of healthcare workers to combat COVID-19, thestress level was found high. Hence strategy to overcome this stress and poor mental health are needed from team leaders or managers at health facilities. Additionally, in individual capacity managing mental health and psychosocial well-being during this challenging time is as important as managing one's physical health.

Keywords: COVID-19, Healthcare workers, Knowledge, Practices, Stress Levels.

INTRODUCTION

Corona Virus Disease-19 (COVID-19) is a novel and highly contagious viral infection caused by SARS-CoV-2 that has affected more than 5 million people worldwide, with a mortality rate of approximately 3.7%[1]. The virus is transmitted from respiratory droplets, or through close personal contact and touching surfaces or objects contaminated with SARS-CoV[2]. Patients with COVID-19 experience a wide range of symptoms, including high grade fever, headache, Cough, shortness of breath or difficulty breathing, myalgia, loss of taste or smell. Most patients report mild to moderate symptoms and recover with supportive treatment only. While those who developed the severe form, require artificial ventilation as they suffer from respiratory failure from acute respiratory distress syndrome (ARDS). Symptoms may appear 2-14 days after exposure to the virus[1-3].

This pandemic has put the world into a state of mental catastrophe, because of the unpredictable and highly contagious nature, varied clinical presentations, epidemiological features, seriousness of public health impact, novelty and under prepared health facilities. It is not uncommon to experience increased levels of fear, stress and anxiety amongst people particularly as a result of social isolation. Worldwide, as millions of people stay at home to minimize transmission of virus, health-care workers prepare to do the exact opposite. They have been working day in and out

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for their patients. As hospitals struggle to get their staffs what they need, the lack of Covid-19 testing and protective equipment does not just put health care providers at risk; it imperils their entire communities[4-7]. A recent study concludes that apart from causing the morbidity and mortality amongst the medical workers in china, the pandemic also had a serious impact on the mental and psychological states. They suffered from frustration, fear, anxiety, depression and insomnia[8]. Health care workers are also concerned they might die from COVID-19. This could seem like an irrational fear, but frontline health care workers have died in china, Italy, and United States[9].

These mental health problems not only affect the attention, understanding and decision-making power of healthcare workers, but also their well-being. Moreover, maintaining the mental health of healthcare workers is very essential to better control infectious diseases. At this point with so much going on it is very important to evaluate the stress level of front-line healthcare workers along with the update of their knowledge and practices so that in future necessary measures can be taken as these factors could hinder the fight against COVID-19. Thus in this study we aimed to evaluate the knowledge, practices, concerns and stress level of the healthcare workers of Pakistan.

METHODOLOGY

This cross sectional surveywas carried out at various hospitals of Pakistan from 20th April to 20th of May 2020. The study has been approved by an ethical and Review Committee AIDM ERC/01/2020/03 through an expedited process. Open Epi sample size calculator was used to calculate the sample size of this study, keeping the mean score of 13.8123 ± 6.34 for perceived stress scale. After keeping 95% confidence interval. The total sample size calculated was 1397. A well-structuredquestionnaire consisted of 18 questions were constructed and validated through Cronbach alpha. The internal consistency of items tested had a strong correlation value of (α=0.72). The questionnaire had two sections demographic part and Responses covering Knowledge, concerns, practices and Stress level assessment of Health care workers. The questionnaire was uploaded at www.surveys.google.com and the link was distributed through e-mail (Yahoo, outlook, Gmail, Hotmail) and shared on social media (Facebook, Instagram, WhatsApp, LinkedIn, Twitter) with HCWs.

The questionnaire was filled by 1397 participants including Physicians, Dentists, Physiotherapists, Nurses, Technicians and Assistants. Those Healthcare workers who were not in practice along with the hospital management staff were excluded. 1346 forms were included and 51 were excluded based on repetition and irrelevance to the study. The data collected were entered in Statistical Package Software version 25. Descriptive statistics were carried out for mean, frequency and percentage calculation of variable. Chi square, Independent t-test and Spearman correlation was used to assess the effect of age, gender and contact history with COVID-19 patient with Perceivedstress scores amongst HCW. The *p*-value of ≤0.05 was considered statistically significant.

Table-I: Demographic details of participants n=1346.

Age (Years)	**n %**
26-30	531 (39.5)
22-25	21.5 (290)
31-35	293 (21.8)
36-40	98 (7.3)
41-45	39 (2.9)
More than 45	36 (6)
Education	
MBBS	405 (30.1)
BDS	805 (59.8)
Nursing/Physiotherapy	116 (8.6)
Certificate holders	20 (1.5)
Gender	
Male	473 (35.1)
Female	873 (64.9)

The Perceived Stress Scale (PST-10) was adopted in this study each question had grade ranging from 0 to 4. Where 0-never 1-almost never 2-sometimes 3-fairly often 4-very often. The PSS Score were obtained by reversing the respon-

ses of questions number 3,4,7 and 8. Lastly adding the score of ten questions to obtain the final score of participants. The PSS score ranges from 0 to 40. Higher the score greater the perceived stress. The characteristics of PSS scoring followed in this study are given below: (a) The Scores ranging from 0-13 were considered low stress. b) The Scores ranging from 14-26 were considered moderate stress. c) The Scores ranging from 27-40 were considered high perceived stress.

RESULTS

Out of the total 1397 HCW responded, 873 (64.9%) females and 473 (35.1%) males participated in the study at a response rateof 346 (96.34%). Majority 531 (39.5%) were from 26-30 years of age. 1210 (89.9%) medical/dental professionals and 136 (11.1%) Physiotherapists, Nurse and Auxiliary staff members as presented in table-I.

The contact history of HCW with COVID-19 patients was 537 (39.9%). Moreover, the Knowledge level of HCW towards COVID-19 assessed was 75% that comprises of command on route of transmission 93.1%, sign and symptoms 79.8%, SARS-CoV-2 survival outside human body 27.8%,

Table-II: Characteristics of knowledge and practice levels of healthcare workers (n=1346).

	n (%)		n (%)
Contact history with Severe Acute Respiratory Syndrome Coronavirus-2?		**Are you using Personal Protective Equipment during patient contact?**	
Yes	537 (39.9)	Always	697 (51.8)
No	809 (60.1)	Very often	267 (19.8)
The routes for Severe Acute Respiratory Syndrome Coronavirus-2 transmission are?		Sometimes	271 (20.1)
Respiratory droplets	75 (5.6)	Rarely	58 (4.3)
Airborne droplets	18 (1.3)	Never	53 (3.9)
All above	1253 (93.1)	**Signs and symptoms of COVID-19 are?**	
The Incubation period of Severe Acute Respiratory Syndrome Coronavirus 2 is?		Nausea, Vomiting, Diarrhea	1.8 (1.3)
2-14	1306 (97)	Fever, Cough, Myalgia, difficulty in breathing	1074 (79.8)
3 weeks	20 (1.5)	All of above	234 (17.4)
Do not Know	20 (1.5)	Do not know	20 (1.5)
The Mortality rate of COVID-19 is?		**The Survival period of Severe Acute Respiratory Syndrome Coronavirus-2 outside body is?**	
1-2%	483 (35.9)	9 hours	374 (27.8)
2-4%	444 (33)	> 48 hours	310 (23)
5-10%	174 (12.9)	Two Days	173 (12.9)
<10%	56 (4.2)	<24 hours	151 (11.2)
Do not know	189 (14)	**Treatment options of COVID-19 are?**	
Concern of Contracting virus to self from patients		Quarantine and social distancing	1152 (85.6)
Yes	1209 (89.8)	Vaccines	35 (2.6)
No	117 (10.2)	Preventive Measures	159 (11.8)
Do you frequently clean and wash your hands?		**Concern of spreading virus to the family**	
Always	925 (68.7)	Yes	1229 (91.3)
very often	288 (21.4)	No	8.7 (117)
Sometimes	8.5 (114)	**Do you wear N95 mask in Surgical Procedures?**	
Rarely	1 (0.1)	Always	985 (73.2)
Never	18 (1.3)	Very often	139 (10.3)
		Sometimes	114 (8.5)
		Rarely	35 (2.6)
		Never	73 (5.4)

Incubation period 97%, Mortality rate 35.9% and treatment options 85.6%.

A striking 1209 (89.8%) of the participants were concerned that they could contract the virus and 1229 (91.3%) had a fear that they can spread it to their families. Furthermore, correct practice level was 64.65% that includes washing hands frequently 68.7%, using N95 mask 73.2%, using PPE in Hospital and other close contact procedures 51.8%, Disinfecting essential surfaces and objects 64.9% amongst HCW as presented in table-II.

Table-III: Characteristics of perceived stress scale (n=1346).

	Perceived stress scale-10 score in the last month,	Mean ± SD
PSS-1	How often have you been upset because of something that happened unexpectedly?	3.27 ± 1.15
PSS-2	How often have you felt that you were unable to control the important things in your life?	3.17 ± 1.28
PSS-3	How often have you felt nervous and stressed?	3.13 ± 1.26
PSS-4*	How often have you felt confident about your ability to handle your personal problems?	2.60 ± 1.18
PSS-5*	How often have you felt that things were going your way?	2.89 ± 1.15
PSS-6	How often have you found that you could not cope withall the things that you had to do?	2.95 ± 1.20
PSS-7*	How often have you been able to control irritations in your life?	2.81 ± 1.01
PSS-8*	How often have you felt that you were on top of things?	3.02 ± 0.94
PSS-9	How often have you been angered because of things that happened that were outside of your control?	3.11 ± 1.15
PSS-10	How often have you felt difficulties were piling up so high that you could not overcome them?	2.98 ± 1.15
Total Score		29.93 ± 11.43**

*Scores arranged in reverse order, **High perceived stress levels

Additionally, when assessed the perceived stress level score of HCW was 29.93 ± 1.518 (table-III). When PSS score was compared with Gender and age, a significant difference (p=0.04) and (p<0.001) were found as shown in table-IV. Moreover, there was no significant relationship of perceived stress level with HCWwith and without history of COVID-19 patient contact (p=0.09).

Table-IV: Effect of gender on perceived stress scale score (n=1346).

Gender		Perceived stress scale-10 score	*p*-value
Male	Mean ± SD	27.72 ± 1.11	0.04
	N	473	
Female	Mean ± SD	31.05 ± 1.17	
	N	873	

DISCUSSION

Although medicine is already considered as a stressful profession under normal circumstances, But Covid-19 pandemic has placed HCWs in an unprecedented situation; they are not just treating a flood of COVID-19 patients under extreme pressures but also risking their own health. In order to effectively manage the current pandemic situation it is very important to evaluate the mental status and stress level of HCWs along with their knowledge about the disease and precautionary measures they are taking. According to our study the Knowledge level of HCW towards COVID-19 assessed was 75%, which is in accordance with a study in which 88.4% of the HCWs possessed good knowledge[10]. However, Poor knowledge levels persist amongst HCWs as shown in a previous study by Zhou *et al*, conducted in March 2020 in china[11]. 93.1% of the participants believed that SARS-COV-2 can be transmitted from respiratory droplets, or through close personal contact and touching surfaces/ objects contaminated with SARS-CoV-2 which is in accordance with other studies that also confirmed that Person-to-person transmission occurs primarily via direct contact or through

droplets spread by coughing or sneezing from an infected individual[12,13].

Majority (79.8%) of the participants had an idea that fever, cough, shortness of breath and myalgia are the most common sign and symptoms of COVID-19 which is in accordance with study by Guan *et al*, in which they found that the common clinical manifestations of COVID-19 are fever (88.7%), cough (67.8), fatigue (38.1%), shortness of breath (18.6%) and headache (13.6%)[14]. In contrast another study showedthe evidence of it presenting as asymptomatic[15]. Furthermore, in this study majority (27.8%) believed that the virus could survives only 9 hours outside the body which is in contrast with a study that proved that SARS-CoV-2 can remain viable and infectious in aerosols for hours and on surfaces up to days, which is striking and recommended precautions should be taken to prevent its exposure[16]. Majority (97%) of the participants were well aware of the Incubation period been 2-14 days and (85.6%) believing that symptomatic treatment is the best way to fight against COVID-19, which is in accordance to Guo *et al*[17], the best possible treatment is symptomatic relief and respiratory support as vaccines and antiviral drugs are yet to be developed[17].

A striking 89.8% of the participants were concerned that they could contract the virus and 91.3% had a fear that their family can contract virus family which is in accordance with other studies which concludes that the HCWs had concerns for personal safety and their families that they might contract the virus, also they were concerned for patient mortality and these were the important stress-triggering factors in the medical staff[18,19].

Furthermore, the practices level was 64.65% which is not enough in the current circumstances as the virus is extremely contagious and, in some cases, asymptomatic occurrence can happen therefore, strict cross infection protocols are recommended. In this study, majority 68.7% of the HCWs do practice hand hygiene frequently, 73.2% uses N95 mask in high risk areas and 51.8% uses PPE in Hospital and other close contact procedures but according to a study, the widespread use of recommended precautions (such as masks, gloves, gowns, and face shields) must be of highest priority. Apart from that enhanced hand hygiene and surface decontamination are key to safety as the virus is very stable on some surfaces and can live up for hours or days, but can be effectively killed by available disinfectants when properly used. The precautionary barriers will fail to protect HCWs who later encounter contaminated surfaces and fail to wash their hands. In our study only 64.9% HCWs disinfects essential surfaces and objects. So, in a nutshell HCWs must focus on meticulous hand hygiene, surface decontamination and universal precautions[20,21].

Ironically, the perceived stress level score of HCW of Pakistan was 29.8 which isquite higher as compared other studies by Limcaoco RS (PSS-10 score was 17.4)[22], and Du J, (PSS score was 13.81)[23], although a few studiesdid conclude that there is increasing evidence that COVID-19 can be an independent risk factor for stress in HCW. This could be the result of certain factors including excessive workload/work hours, inadequate PPEs, over-enthusiastic media news, inadequate government support and increasing morbidity and mortality of HCWs due to COVID-19[18]. Our study is also in accordance with other studies in which more than half of the participants suffered from moderate to extremely-severe stress when assessed with other tools[24,25].

Moreover, when PSS score was correlated with gender and different age groups,significant difference (p=0.04) and (p≤0.001) were found, with high stress levelsin women and young HCWs (82.76% between 22 to 35 years). Also, no significant relationship of perceived stress level was found with HCW with and without history of COVID-19 patient contact (p=0.09). This is in accordance to Limcaoco *et al*[22], in which a significantly higher perceived stress scores were observed among women,younger individuals and students during COVID-19 pandemic.

To summarize, these acute stresses and extreme pressure can lead to mental health issues, thus affecting the performance and well-being of the HCWs. So, in order to support them, experts need to intervene to help protect their mental health, not just their physical health. Developed nations are already working on it and we should follow their lead.

LIMITATION OF STUDY

The findings in this research are based on recall ability of participants at a single point of time, in our opinion this can cause recall bias. Furthermore, our findings are specific to certain demographic regions and based on local community. Hence further investigation grounded on a large-scale audience from developed and developing countries are needed for clarification. Despite these limitations our study came up with valuable insight on current knowledge and practices of healthcare workers with emphasizes on identifying mental health issues and suggesting efforts for improving mental health levels to combat this challenging time.

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CONCLUSION

The present study depicts adequate knowledge and practices levels of Health care workers to combat COVID-19 working in different stations and capacities. Despite of that, the mental stress level is found high. Hence strategy to overcome acute stress and poor mental health are needed from team leaders or managers at health facilities. Additionally, in individual capacity managing mental health and psychosocial well-being during this challenging time is as important as managing one's physical health.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

REFERENCES

1. Guo YR, Cao QD, Hong ZS, Tan YY, Chen SD, Jin HJ, et al. The origin, transmission and clinical therapies on coronavirus disease 2019 (COVID-19) outbreak–an update on the status. Military Medical Res 2020; 7(1): 1-10.
2. Ahmed N, Shakoor M, Vohra F, Abduljabbar T, Mariam Q, Rehman MA. Knowledge, Awareness and Practice of Health care Professionals amid SARS-CoV-2, Corona Virus Disease Outbreak. Pak J Med Sci 2020; 36(COVID19-S4): S49–S56
3. Ahmed N, Maqsood A, Abduljabbar T, Vohra F. Tobacco Smoking a Potential Risk Factor in Transmission of COVID-19 Infection. Pak J Med Scien 2020; 36(COVID19-S4): S104-7.
4. Wang C, Pan R, Wan X, Tan Y, Xu L, Ho CS, et al. Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. Int J Environ Res Public Health 2020; 17(5): 1729-32.
5. Ahmed MA, Jouhar R, Ahmed N, Adnan S, Aftab M, Zafar MS, et al. Fear and practice modifications among dentists to combat Novel Coronavirus Disease (COVID-19) outbreak. Int J Environ Res Public Health 2020; 17(8): 2821-24.
6. Ahorsu DK, Lin CY, Imani V, Saffari M, Griffiths MD, Pakpour AH. The fear of COVID-19 Scale: development and initial validation. Int J Ment Health Addict 2020; 1(1): 1-9.
7. Lu W, Wang H, Lin Y, Li L. Psychological status of medical workforce during the COVID-19 pandemic: A cross-sectional study. Psychiatr Res 2020; 288(1): 112936-40.
8. Spoorthy MS, Pratapa SK, Mahant S. Mental health problems faced by healthcare workers due to the COVID-19 pandemic-A review. Asian J Psychiatr 2020; 51(1): 102119-22.
9. Lancet T. COVID-19: protecting health-care workers. Lancet (London, England) 2020; 395(10228): 922-25.
10. Huynh G, Nguyen TN, Tran VK, Vo KN, Vo VT, Pham LA. Knowledge and attitude toward COVID-19 among healthcare workers at District 2 Hospital, Ho Chi Minh City. Asian Pac J Trop Med 2020; 13(1): 260-65.
11. Zhou F, Yu T, Du R, Fan G, Liu Y, Liu Z, et al. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. Lancet 2020; 395(10229): 1054-62.
12. World Health Organization (WHO). Modes of transmission of virus causing COVID-19: implications for IPC precaution recommendations: scientific brief, 27 March 2020. Available at: https://www.who.int/news-room/commentaries/detail/mode-of-transmission-of-virus-causing-COVID-19-implications-for-ipc-precaution-recommenda-tions (accessed on: 23/03/2020).
13. Rothan HA, Byrareddy SN. The epidemiology and pathogenesis of coronavirus disease (COVID-19) outbreak. J Auto 2020; 109(1): 102433-36.
14. Guan WJ, Ni ZY, Hu Y, Liang WH, Ou CQ, He JX, Liu L, et al . Clinical characteristics of coronavirus disease 2019 in China. New Engl J Med 2020; 382(18): 1708-20.
15. Hu, Z, Song C, Xu C, Jin G, Chen Y, Xu X, et al. Clinical characteristics of 24 asymptomatic infections with COVID-19 screened among close contacts in Nanjing, China. Sci China Life Sci 2020; 63(1): 706–11.
16. Van Doremalen N, Bushmaker T, Morris DH, Holbrook MG, Gamble A, Williamson BN, et al. Aerosol and surface stability of SARS-CoV-2 as compared with SARS-CoV-1. Engl J Med 2020; 382(16): 1564-57.
17. Guo YR, Cao QD, Hong ZS, Tan YY, Chen SD, Jin HJ, et al. The origin, transmission and clinical therapies on coronavirus

disease 2019 (COVID-19) outbreak–an update on the status. Military Med Res 2020; 7(1): 01-10.
18. Cai H, Tu B, Ma J, Chen L, Fu L, Jiang Y, Zhuang Q. Psychological Impact and Coping Strategies of Frontline Medical Staff in Hunan Between January and March 2020 During the Outbreak of Coronavirus Disease 2019 (COVID-19) in Hubei, China. Med Sci Monit 2020; 26(1): e924171-75.
19. Mohindra R, Suri V. Issues relevant to mental health promotion in frontline health care providers managing quarantined/isolated COVID19 patients. Asian J Psy 2020; 51(3): 102084-84-86.
20. Singhal T. A Review of Coronavirus Disease-2019 (COVID-19). Ind J Ped 2020;87(4): 281-86.
21. Adams JG, Walls RM. Supporting the health care workforce during the COVID-19 global epidemic. J Am Med Assoc 2020; 323(15): 1439-40.
22. Limcaoco RS, Mateos EM, Fernandez JM, Roncero C. Anxiety, worry and perceived stress in the world due to the COVID-19 pandemic, March 2020. Preliminary Results Med Rxiv 2020;
23. Du J, Dong L, Wang T, Yuan C, Fu R, Zhang L, et al. Psychological symptoms among frontline healthcare workers during COVID-19 outbreak in Wuhan. Gen Hosp Psychiatr 2020; S0163-8343(20): 45-49.
24. Chew NW, Lee GK, Tan BY, Jing M, Goh Y. A multinational, multicenter study on the psychological outcomes and associated physical symptoms amongst healthcare workers during COVID-19 outbreak. Brain Behav Immun 2020; 21(1): 23-27.
25. Huang JZ, Han MF, Luo TD, Ren AK, Zhou XP. Mental health survey of 230 medical staff in a tertiary infectious disease hospital for COVID-19. Chinese J Ind Hygien Occup Diseas 2020; 38(3): 192-95.