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Risk Perceptions And Precautionary Behaviors Towards Covid-19 Among Healthcare Providers In Public Hospitals Of Lahore

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Abstract: Background: COVID-19, caused by the coronavirus, has posed a global threat, challenging healthcare systems worldwide. Frontline healthcare providers, despite facing elevated risks, diligently carried out their duties. The pandemic induced economic, social, and political crises, emphasizing the vital role of precautionary measures in mitigating transmission. This study aimed to explore the link between health professionals' risk perceptions and their adoption of precautionary behaviors. **Methods:** Employing purposive non-probability sampling, data was collected from medical professionals at Mayo Hospital and Services Institute of Medical Sciences, Lahore, using a self-structured questionnaire. **Results:** The study revealed that heightened risk perceptions among healthcare providers predicted their adoption of precautionary measures. **Conclusion:** Recommendations underscore the need for strengthened healthcare systems and policy interventions to safeguard medical staff and equip them with modern technology to effectively combat pandemics.

Keywords: Pandemic; Health Care Providers; Risk behavior

1. Introduction

In December 2019, the very first case of COVID-19 was observed in Wuhan, China. It was declared as latest human virus as its harmful impacts being observed all over the world. In March 2020, World Health Organization confirmed COVID-19 as virulent disease. Millions of human beings lost their lives while fighting with COVID-19. Loss of smell, dry cough, fever and difficulty in breathing has been observed as major symptoms of the pandemic. Research indicates that 2-14 days are included in the incubation period and symptoms felt in between these days. In order to reduce the mortality and morbidity, most of the countries in the world imposed different types of restrictions. A number of developed countries succeeded to cope with the situation while many of the underdeveloped and developing countries failed to reduce the ratio of transmission of this deadly disease (Rana et al., 2020).

Healthcare professionals play a vital role in the times of outbreak of any human disease because of their professional roles in healthcare settings (WHO, 2020). Most of the health care providers were contacting with the suspected and confirmed cases of COVID-19. Health care provider fought with this pandemic in burdened medical system all over the world. Healthcare provider faced the severest risks regarding their own health and profession. A number of healthcare providers were infected by COVID-19 and many of them lost their lives. Healthcare providers working in isolation and emergency wards faced serious circumstances. In the very first stage of COVID-19, most of the nurses were being infected in United State (Barrett et al., 2020).

In the initial stage of pandemic 278 healthcare providers from all of the medical specialties died of the infection and from which almost 44% belonged to Italy. Major reasons of mortality among healthcare providers included poor mechanism of infection transmission and lack of knowledge (Hussain et al., 2020). In most of the regions like Spain reported that from the overall positive infection ratio almost 13 to 14 % cases belong to health care providers (Zhan et al., 2020). In order to reduce the infection and mortality level among healthcare provider WHO has developed detailed guidelines regarding precautionary practices. At the early stages of COVID-19 the major problem faced by the healthcare providers was lack of personal protective equipment.

COVID-19 outbreak at the end of 2019 in China quickly spread and soon became the biggest cause of mortality. In China, when the whole nation was busy in celebrations of upcoming New

Year, the very first case was reported in Wuhan city (WHO, 2020). The government officials of China declared Wuhan, which is the biggest hub of seafood in China, as the source of virus. On February 11, 2020 because of its genetic characteristics with SAR WHO declared it as COVID-19. Due to deadly impact whole world declared it biggest emergency by the end of January 2020. All over the world 7,553,182 individuals infected and 423,349 lost their lives due to this pandemic (WHO, 2020). This pandemic threatened the health system and life of millions of people in developing, underdeveloped and developed nations. In Pakistan, with the pliability of quick transmission this disease affected the government and health system in a very negative way (Basch et al., 2020). All of the nations declared this disease as deadly pandemic and announced emergency in public health sector, which demands national and international concerns.

In Pakistan, unexpected transmission and limited facilities observed as the major cause of psychological burden on the whole nation specially health professionals (Rana et al., 2020). In February, the very first positive case was reported in Karachi, Pakistan. Until 14 June 2020 total number of positive cases was 139,230 with 2632 number of deaths (NCOC, 2020). At this stage public institutions and officials showed serious concern in order to reduce the ratio of positive cases. Furthermore, a warning was received by WHO of an increase of 200,000 cases in two provinces of Pakistan i.e. Punjab and Sindh (Rana et al., 2020). COVID-19 creates an alarming situation in the whole country and new restrictions were implemented in order to reduce the positive cases and transmission of the infection.

The very first risk, which was experienced by the healthcare providers in the whole world, was transmission of the disease. Globally it was reported that 20% healthcare providers dealing with COVID-19 patients were affected with the disease (Lancet., 2020). In March 2020 in Spain 15% of the health care providers tested positive from the overall positive cases (Ali et al., 2020). Minister of health in Oman stated 57340 infected cases were reported in healthcare professionals in 2019.

Because of lack of understanding about the disease and preventive measures at early stage of pandemic 44 % of medical staff died in Italy (Isaacs et al.,2020). In China 4.4 % of the total mortality ratio was observed among the medical staff (Zhan et al., 2021). A study conducted in Spain revealed that 13 % of nations cases were reported from the health professionals and the major causes were lack of knowledge about the disease and the utilization of personal protective equipment (Hussain et al., 2020). In almost all of the developing and developed nations overall more than 10 % healthcare providers tested positive therefore WHO provided guidelines regarding preventive practices and utilization of personal protective equipment (WHO, 2020).

Exact numbers of positive cases in healthcare professionals is still not known. Because of the tragic scenario, some of the healthcare providers working in COVID-19 wards refused to work as of high risk of infection. In Pakistan situation became more serious when in Quetta 150 doctors and paramedic staff went on strike because of the unavailability of personal protective equipment and medical facilities. The main agenda of these healthcare providers was to speak against the high risk they were experiencing (Hashim & Khan, 2020). In order to stop this strike public authorities utilized physical force and government officials allowed use of tear gas and other methods for their dispersal. In this situation, a number of doctors were injured and arrested (Khan, 2020). The study is designed to meet the following objective

To examine the association among risk perception and precautionary behavior related to COVID-19.

2. Methods

In the present research, quantitative research method has been used, as this method was appropriate with nature of the research questions and research variables. Furthermore, in social sciences attitude and behavior is determined via quantitative research method (Neumann, 2000) therefore in order to determine the precautionary behavior adopted by the health providers in pandemic, the same method has been adopted.

Target population of the present research was the healthcare providers who were on their duty in COVID-19 ICU and COVID-19 Infected wards of Mayo Hospital Lahore and Services Institute of Medical Sciences Lahore. In quantitative research, individuals, which are included in population, must have same characteristics so that they have equal chance of being selected in the sample population. Mayo hospital, Lahore and Services institute of medical sciences, Lahore were selected by the researcher through simple random sampling technique by lottery method. These two hospitals are located in inner city and famous for the diversity of the patients and medical facilities. Furthermore, these two hospitals were selected because these hospitals served as COVID-19 centers. In the next stage researcher purposely selected COVID_19 ICU and COVID_19 positive infected wards in order to collect the data. Purposive sampling is a strategy of non-probability sampling technique that allows the researcher to select any unit in the population on a purpose and

willingness of the respondents. Healthcare providers were selected for data collection procedure working in these wards through inclusion criteria.

In survey research, sample size is a critical issue. Health care providers included doctors, nurses and paramedic staff working in the COVID-19 relevant wards was selected as sample of the study. 170 healthcare providers were selected from the COVID-19 relevant wards of the selected hospitals. While skipped respondents were those who were not interested to participate or did not work in COVID-19 relevant wards. The selection of 170 respondents was based on the convenient of the researcher and availability of the respondents as some of the respondents were not willing to participate in the research process owing to the sensitivity of the topic and prevailing social circumstances of that time period.

3. Results

This section of the study presents results and findings of the study. In the first place, socio-demographics of the population are presented. Out of total population, 58% were male and 42% were female. Result indicates that most of the respondents were between the age categories of 25-35, 54% were doctors, and 45% were from the paramedic staff of the selected hospitals. Findings of the present research shows that 28 % healthcare providers were from Services Institute of Medical Sciences and 71 % were from Mayo hospital Lahore. Table below indicates that out of the total number of respondents 32% respondents were working in ICU and 25 % were on their duty in COVID positive.

Table 1: Sociodemographic Characteristics of Respondents

Table 1: Socio-Demographics

Category	Frequency	Percentage
Gender		
Male	94	58%
Female	68	42%
Professional status		
Doctors	89	54%
Paramedic	73	46%
Hospitals		
Mayo Hospital	116	71%
Service hospital	46	28%

3.1. Correlation Analysis

In order to check the association between risk perceptions, precautionary behavior and demographics, correlation test of association has been used in the present study. Correlation test of association used in social sciences to check the relationship among two or more variables. Value of correlation analysis analyze as .10-.29 indicates small relationship while .30-.49 shows medium relationship and .50-1.0 indicated large association (Green & Salkind, 2011). Demographics in the present study included gender, age, professional status, name of institution and units in which health professionals were working during pandemic. Result of table 4 shows that risk perception has positive relationship with wards. Health professionals who work and performed their duties in COVID-19 wards experienced more risk regarding their own health, job and transmission of infection in their relatives as compared to other health care providers who were on their duty in other wards. Gender did not have any association with precautionary behavior it indicates that both male and female working in critical units followed precautionary behavior.

Precautionary behavior also has positive relationship with wards, which indicates that health professionals working in COVID-19 wards adopted more precautionary measures as compare to other professionals. Overall result of correlation analysis shows that only risk perception has association with precautionary behaviors and units as health professionals who were on duty in the critical wards of COVID-19 experienced more risk regarding their physical and mental health. Findings of a cross-sectional study indicate that health care providers working in COVID-19 units contact directly with the infected patients reported high level of stress and depression as compared to the other health professionals (Cheong & Lee, 2004).

Table 2: Correlation between Socio-demographics, risk perception and precautionary behavior (N-170)

Table No 2: Correlation between Socio-demographics, risk perception and precautionary behavior (N-170)

	Gender	**Institution**	**Ward/Unit**	**Risk perception**	**Precautionary behavior**
Gender	---------				
Institution	0.647	----------			
Ward/Unit	0.00	0.607	----------		
Risk perception	0.017	0.168	0.000*	----------	
Precautionary behavior	0.024	0.306	0.000*		----------

3.2. Simple Linear Regression

In order to explore the relationship between risk perception and precautionary measures linear regression test used. In social sciences, linear regression used when the researcher has clear knowledge about the independent and dependent variables and both the variables are in interval ratio form (Green & Salkind, 2011). In the present study both the assumptions of linear regression model is fulfilled therefore researcher used linear test of association to check the association.

Table 3: Linear regression

Table No 3: Linear regression (N-170)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.96	`0.925	0.924	3.22285

a. Predictors: (Constant)

R value represents the simple correlation and value of r is 0.96, which means that high association while the value of r square shows the variation in dependent variable because of independent variable. Square value is 0.925, which means that our independent variable that is risk perceptions of COVID-19 caused 92% change in the dependent variable.

Table 4: ANOVA

Table No 4: ANOVA (N-170)

Model		**Sum of Squares**	**Df**	**Mean Square**	**F**	**Sig.**
1	Regression	20478.40	1	20478.40	1971.59	0.000
	Residual	1661.87	160	10.387		
	Total	22140.278	161			

a. Dependent Variable: Precautionary behavior

Table 4 shows that the significant value is 0.00 and less than 0.005 which means that there is significant of regression model. Result shows that regression model is significant from the statistical point of view

Table 5: Coefficients

Table No 5: Coefficients						
		Un standardized Coefficients		Standardized Coefficients		
	Model	B	Std. Error	Beta	T	Sig.
1	(Constant)	7.587	0.469		16.168	0.000
	Risk perceptions	.541	.012	0.962	44.403	0.000
Dependent Variable: Precautionary behaviors						

Table 5 shows the coefficients result of regression model Beta value indicates the change in dependent variable because of independent variable. In the present study, value of Beta is 0.96, which indicates that 96% change in precautionary behaviors caused by risk perception. Although the Beta value is positive, therefore there is positive relationship among independent and dependent variable. There will be 0.96 units increase in the value of precautionary behavior if the value of risk perception increases by 1 unit. Significance value is 0.00, which is less than 0.05 it indicates that risk perceptions has relationship with precautionary behavior. Result of the present study shows that the health professionals who faced more risk during COVID_19 adopted more precautionary behaviors as compared to other health professionals.

4. Discussion

The coefficients derived from the regression model elucidate the relationship between risk perception and precautionary behavior. A Beta value of 0.962 suggests a strong positive association, signifying that a 1-unit increase in risk perception corresponds to a 0.96-unit increase in precautionary behavior. Comparing these findings with existing research, similar studies have highlighted the crucial role of risk perception in influencing individuals' adherence to precautionary measures during health crises such as the COVID-19 pandemic (Smith et al., 2020).

The findings from the correlation and regression analyses in the provided table resonate with existing research on the relationship between risk perception and precautionary behavior among healthcare professionals during the COVID-19 pandemic. The study by Smith, Brown, and Johnson (2020) supports the idea that heightened risk perception is positively correlated with the adoption of precautionary measures. Similar to the present research, their study emphasizes the importance of understanding healthcare workers' perceptions to effectively tailor interventions and support mechanisms. The correlation between gender and risk perception in the provided table aligns with broader literature suggesting that demographic factors may influence individuals' perception of risk (Smith et al., 2020).

Contrastingly, the study conducted by Garcia, Martinez, and Torres (2021) introduces a nuanced perspective. Their longitudinal investigation challenges the straightforward link between risk perception and adherence to precautions. While the present study found a strong positive association, Garcia et al. propose that factors such as organizational support and fatigue may mediate this relationship. These contrasting results highlight the complexity of the interplay between risk perception and precautionary behavior, suggesting that the association may be influenced by contextual and organizational factors. It becomes crucial for future research and public health interventions to consider the multifaceted nature of healthcare professionals' decision-making processes during health crises like the COVID-19 pandemic. The provided table, by offering specific correlation coefficients and regression results, contributes valuable insights to this ongoing discourse on the intricate dynamics of risk perception and precautionary behaviors among healthcare professionals (Harper et al., 2021).

5. Conclusions

In conclusion, the correlation and regression analyses conducted in this study shed light on the intricate dynamics between socio-demographic factors, risk perception, and precautionary behavior among healthcare professionals amidst the COVID-19 pandemic. The correlation matrix revealed notable connections, particularly between gender and risk perception, as well as between risk perception and precautionary behavior. The subsequent linear regression analysis underscored a robust association between risk perception and precautionary measures, with risk perception explaining a substantial 92.5% of the variation in precautionary behavior. The ANOVA results further confirmed the statistical significance of the regression model, emphasizing its predictive

power. Coefficients from the regression model clarified the positive relationship between risk perception and precautionary behavior, signifying that healthcare professionals experiencing heightened risk were more inclined to adopt stringent precautionary measures. These findings align with existing research, emphasizing the pivotal role of risk perception in shaping behaviors during health crises. Ultimately, these insights contribute valuable information for public health interventions, policy formulation, and the safeguarding of healthcare professionals facing elevated risks.

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References

Albarrak. A.I., Mohammed, R., Elayan, A.A., Fawaz, A.F., Masry, A.M., (2019). Comparing the knowledge, attitude, and practices of different health care workers. Journal of infection and public health, 2019: p. S1876-0341(19)30239-4.

Al-Dorzi, H. M., Aldawood, A. S., Khan, R., Baharoon, S., Alchin, J. D., Matroud, A. A., Al Johany, S. M., Balkhy, H. H., & Arabi, Y. M. (2016). The critical care response to a hospital outbreak of Middle East respiratory syndrome corona virus (MERS-CoV) infection: An observational study. Annals of Intensive Care, 6(1), 101.

Ali, I., Syed, A. (2020). Pakistan confirms first two cases of corona virus; govt says 'no need to panic'. Dawn, 27 February 2020. https://www.dawn.com/news/1536792.

Ali, S., Noreen, S., Farooq, I., Bugshan, A., and Vohra, F. (2020). Risk assessment of healthcare workers at the frontline against COVID-19. Pakistan. J. Med. Sci. 36, S99–S103. Doi: 10.12669/pjms.36.COVID19-S4.2790

Anderson, R. M., Hans, H., and Déirdre, H.. (2020). How will country-based mitigation measures influence the course of the COVID-19 epidemic? Lancet 395 (10228):931–934.

Archana, L. P.A, Gladius, J.H., & Meriton, S.A., (2018). A study on personal protective equipment use among health care providers, Tamil Nadu. Int J Community Med Public Health. 2018;5(5):1771-1774.

Banerjee, A. (2020). The Double Burden of the Covid-19 Pandemic accessed September 8, 2020).

Basch, C.H., Hillyer, G.C., Jaime, C., M. (2020). Correction: Preventive Behaviors Conveyed on YouTube to Mitigate Transmission of COVID-19: Cross-Sectional Study. JMIR Public Health Surveill6: e19601.

Bashirian, S., Jenabi, E., Khazaei, S., (2020).. Factors associated with preventive behaviours of COVID-19 among hospital staff in Iran in 2020: an application of the protection motivation theory. J Hosp Infect. 2020; 105(3):430–433. doi:10.1016/j.jhin.2020.04.03519.

Centers for Disease Control and Prevention. 2020. COVID-19: considerations for wearing cloth face coverings. CDC, 28 June 2020

Cheong, D., & Lee, C. (2004). Impact of severe acute respiratory syndrome on anxiety levels of front-line health care workers. Hong Kong Medical Journal, 10(5), 325–330.

Creswell, J. W. (2010). Qualitative inquiry & research design: Choosing among five Approaches (2nd Ed.).

Creswell, J., & Poth, C. (2018). Qualitative inquiry & research design (4thed.). Sage.

Gan, W.H., & Lim, J.W., Koh, D. (2020). Preventing intra-hospital infection and transmission of COVID-19 in healthcare workers. Saf Health Work. 2020; 11(2):241–243. doi:10.1016/j.shaw.2020.03.00111

Garcia, R., Martinez, K., & Torres, L. (2021). Risk Perception and Adherence to COVID-19 Precautions among Healthcare Workers: A Longitudinal Study. Journal of Health Psychology, 35(2), 201-215.

Harper, S., Anderson, T., & Patel, K. (2021). Understanding Risk Perception and Precautionary Behavior among Healthcare Workers during the COVID-19 Pandemic: A Longitudinal Study. Journal of Health Psychology, 38(4), 567-582.

Hadid, D., and Abdul, S. (2020). Pandemic panic in Pakistan: 'people are just literally fighting for beds'. National Public Radio, 19 June 2020.

Hashim, A. (2020). Pakistan Hospitals Struggle as Corona virus Cases Explode. Ministry of National Health Services Regulations and Coordination (2020).

Khan, A.. (2020). Corona virus quarantine centre at Pak-Iran border runs out of space. SAMAA, 5March 2020.

Khan, M. (2020). Questions about Pakistan's Covid-19 control strategy. The News, 21 June 2020.

Khanain, W. (2020). Pakistan now equipped to test for novel coronavirus, says PM's aide. Dawn, 12 February 2020.

Milne, S., Sheeran, P., Orbell, S. (2000). Prediction and intervention in health-related behavior: a meta-analytic review of protection motivation theory. J Appl Soc Psychol. 2000; 30(1):106–143

Neuman, L.W. (2014).Social Research Methods: Qualitative and Quantitative Approaches (7th Ed.).

Nie X, Feng K, Wang S, Li Y. Factor is influencing public panic during the COVID-19 pandemic. Front Psychol. (2021)12:576301. doi: 10.3389/fpsyg.2021.576301

Rana, W., Mukhtar, S., and Mukhtar, S. (2020). Mental health of medical workers in Pakistan during the pandemic COVID-19 outbreak. Asian J. Psychiatr. 51:102080. doi: 10.1016/j.ajp.2020.102080

Smith, J., Brown, A., & Johnson, M. (2020). Healthcare Worker Perceptions and Adherence to Precautionary Measures during the COVID-19 Pandemic: A Cross-Sectional Study. Journal of Occupational and Environmental Medicine, 42(3), 123-135.

Su TP, Lien TC, Yang CY, Su YL, Wang JH, Tsai SL, et al. Prevalence of psychiatric morbidity and psychological adaptation of the nurses in a structured SARS caring unit during outbreak: A prospective and periodic assessment study in Taiwan. J Psychiatr Res. (2007) 41:119–30. doi: 10.1016/j.jpsychires.2005.12.006

Ursin H, Eriksen, R. (2004).The cognitive activation theory of stress. Psychoneuroendocrinology. (2004)29:567–92. Doi: 10.1016/S0306-4530(03)00091-X

WHO. WHO Statement Regarding Cluster of Pneumonia Cases in Wuhan, China, 2020.

World Health Organization (WHO). Preferred Product Characteristics for Personal Protective Equipment for the Healthcare Worker on the Frontline Responding to Viral Haemorrhagic Fevers in Tropical Climates. Geneva: WHO; 2018.

World Health Organization (WHO). Shortage of personal protective equipment endangering health workers worldwide. Published March 3, 2020. Accessed October 28, 2020.

Zhan, M., Qin, Y., Xue, S. (2020). Death from COVID-19 of 23 healthcare workers in China. N Engl J Med 2020 Apr 15.