Covid-19 is a Severe Acute Respiratory Syndrome Corona Virus-2 (SARS-CoV-2), which has exposed the issue of public risk perception among people in Pakistan. Previous research about public risk perception among people in Pakistan has been a neglected area till the writing of the current paper. The study aims to determine the level of public risk perception among people in Pakistan about the Covid-19 pandemic. Why and how public risk perception among health professionals and literate is more than the illiterate people in Pakistan? Data were collected through questionnaires and interviews of populations sampling from five districts through visits in KPK and other provinces via phone calls and online through internet. Theory of Health Belief Model (HBM) was utilized to explain public health risk perception in Pakistan. The lack of public health risk perception has more in illiterate people than literate among people in Pakistan, which has caused the Coronavirus to multiply rapidly in Pakistan. The findings have indicated that both health professionals and other literate people have different health behaviors than those who are illiterate in Pakistan about the Covid-19 pandemic.

**KEYWORDS**
Covid-19, HBM, literate and illiterate, Pakistan, public risk perception
increase and sharpen public sensitivity toward the infectious diseases. Within this context, sociologist and psychologist introduced the HBM theory. This attempt was successful. Similarly, the current paper has reconsidered the utility of HBM in the case of Pakistan where there is a significant gap in terms of public health risk perception.

The paper first has highlighted what is HBM theory and how it is applicable in the current paper. Second, what is health and its role as a social indicator has been examined briefly in a theoretical context. Third, the current epidemiological situation of Covid-19 both globally and in the context of Pakistan has been highlighted to map the study further. Fourth, while reviewing the spread of the virus in the country, the study has identified major issues related to the health behaviors among illiterate people. Fifth, the findings identified that there is negligence in health-related behaviors, particularly risk identification among the illiterate people nationwide. Finally, the current study is based to highlight one of the seminal roles of perception, which can improve public health perception toward risk management.

2 | THEORETICAL FRAMEWORK

When infections of tuberculosis and HIV/AIDS and other infectious diseases were spreading in majority of the developed nations such as the US and beyond, researchers began to devise models and theories to prevent further transmission of lethal microbes among population. Sociologists and psychologists identified flaws in the behaviors on the part of people who have given easy access to lethal microbes to cause worldwide catastrophe in the form of epidemics and pandemics. Against this backdrop, in the 1950s, a group of sociologists and psychologists developed the theory of Human Belief Model (HBM). HBM explained why infectious disease spread exponentially among people. To explain the cause of rapid spread of infection, it has identified many postulates that have guided public health practitioners to understand health-related behaviors of populations. HMB has the following constructs, which are useful to highlight public risk perception. These are the following:

1. Perceived susceptibility refers to show the level of sensitivity in terms of risk toward an infectious agent, such as TB infection, HIV/AIDS, and the current Covid-19.
2. Perceived severity refers to an individual level of feelings on the seriousness of contracting an illness or disease.
3. Perceived benefits indicate an individual perception of effectiveness of various actions available to reduce the risk of the disease.
4. Perceived barriers refer to an individual’s feeling on the obstacle to perform a recommended health action.
5. Cues to action, which explain a stimulus needed to trigger the decision-making process to accept a recommended health action.
6. Self-efficacy is the last assumption, which has explained the level of an individual’s confidence in his or her ability to perform a health-related behavior (Janz, 1984).

The current study is based on the theoretical construct of HBM that why Covid-19 has hit hard the population of Pakistan and other nations despite they knew from the established fact of the spread of the virus in China; however, states including Pakistan failed to stop the outbreak in their national domains. This study has found that it largely lacks public risk perception to give space to the virus to multiply in Pakistan (see Figure 1).

3 | SIGNIFICANCE OF HEALTH IN TERMS OF ECONOMIC AND SOCIAL INDICATORS

Health is wealth. In this regard, Mehbouil-Haq and his colleague introduced Human Development Index in 1990, which has examined human capabilities such as leading a long life, being knowledgeable, and enjoying a decent standard of living. These are represented as health, education, and income. Health has been a valued passion (Alleyne & Cohen, 2002). Economic thinkers have found health as one of human capitals contributing to economic growth and positively impacts on the GDP of the country (Sushant, 2020). According to endogenous growth theories, good health increases human capital, leading to productivity. People with good health are more productive, learn more in schools, they live longer, and thus it causes long-run economic growth of a country (Hanushek & Wobmann, 2010). The available literature on health and economy has shown that the level of per capita income is affected by the level of population health. The economic approaches have recognized that education and health are interlinked in their contribution to economic growth and human capital accumulation of a country. The government policies to increase spending on health might impact the economic growth (Bucci, 2019).

Besides, economic approaches to health both theoretically and empirically the sociological approaches to health have identified it as an important part of society. The functionalist approach, also known as consensus paradigm, dated to the work of August Comte, Emile Durkheim has important contribution to understand health. The functionalist approach has considered society as a living organism. The society functions like a social organism with interrelated and interdependent parts such as political institution that regulates the affairs of society, the economic institution serves to provide goods and services, and the health institutions as a subsystem to provide health care to the ill people. Any institution when does not function properly becomes dysfunctional. Functionalists have viewed health as a prerequisite for the smooth conduct of a society. They consider health as a social value and it is vital for survival and development for society (Amzat & Razum, 2014). Similarly, cultural theory identifies the impact of values and cultural settings on the perception of risk. Cultural context shape an individual perception of risk. In this context, values frame the interpretation of information. For example, individuals with health values will interpret the probability of risks to their lives (Rippl, 2002).

4 | GLOBAL EPIDEMIOLOGICAL SITUATION OF COVID-19 AND HEALTH

In the later weeks of December 2019, the cases of infectious diseases were reported in Wuhan city, Hubei province of China. The infection
was viral pneumonia of unknown etiology. The new viral infection was declared by World Health Organization (WHO) as the sixth public health emergency of international Concern (PHEIC), and on March 11, 2020 the WHO announced it as a pandemic (Abid, 2020). The data collected by John Hopkins University revealed the total infected from the virus is 10,063,319 and deaths 500,108 on June 28, 2020 (Thomson, 2020).

The new infection was caused by Severe Acute Respiratory Syndrome Corona Virus-2 (SARS-CoV-2). The transnational diffusion of the infection changed the infection from an epidemic to a pandemic within the first 3 months. In the initial phase of the infection, the symptoms of this viral infection are fever and dry cough, and these resemble other respiratory illness caused by other virus and bacteria. In a number of reported cases, many patients have not shown symptoms. Due to the lack of proper testing, the number of Covid-19 patients is more than the existing data (Hoffman, 2020).

The infection, before spreading to other regions, killed over 1800 and infected more than 70,000 in 50 days in Wuhan. Chinese Scientists of medical sciences have reported that the current virus is the member of the Beta coronaviruses. First, the virus was named as Wuhan Coronavirus or 2019 Coronavirus. Later, the virus was named by International Committee on Taxonomy of Viruses as Covid-19. Historically, the infection of SARS-CoV infected 8,098 with mortality rate of 9% in a total of 26 countries; however, the current Covid-19 outbreak began in December 2019 and is moving upward to infect and kill millions to date across the world (Shereen, 2020).

5 | CURRENT EPIDEMIOLOGICAL SITUATION IN PAKISTAN AND HEALTH

The Covid-19 virus soon spread in February 26, 2020 in Karachi city in Sindh Province of Pakistan. The estimated population of Karachi is 204.65 million. The virus easily swept across the country and has currently become an epidemic (Abid, 2020). The total number of confirmed cases are indicated below, which show that the virus multiplied more from April 2020 to the month of July 2, 2020 (see Figures 2–5).

6 | CAUSES OF THE RAPID SPREAD OF COVID-19

Viewing the health institution in Pakistan, it has many challenges both at the economic, functional, cultural context and lack of public health perception. The health institution ranks lower than the global level in Pakistan. The funds for health sector have been only 2% against the 10% of the global level (Pradhan & Mistry, 2020). Within this context, according to Global Security Index (GSI), Pakistan has poor preparedness for pandemics. The GSI has ranked Pakistan 105th of 195 countries. Besides poor health indicator, Pakistan lacks essential healthcare infrastructure, communication during public health emergencies, infection control, and availability of instruments. Moreover, the health sector in the country is divided and fragmented, lacking coherence due to limited
resources, expertise, and the power among many ministries, authorities, and institutes. It has no specialized plan of coordination, real-time monitoring, predictive modeling, policy formulation, legislation, and workforce planning and development. The International Association of National Public Health Institutes (IANPHI) indicates about the capacity to disease surveillance to investigate pandemics and epidemics, promotion of relevant research, and evidence based policy making in partnership with public and private stakeholders in the health sector (Ahsan, 2020).

Moreover, the country lacks behind in public perception of health-related behaviors. The results of the current study have indicated that the general public has inappropriate risk perception about their health at the susceptibility and severity levels. The detail of the finding is discussed elsewhere in the paper.

Both low public expenditure on health and impaired function of the health sector, and the arrival of novel Coronavirus have exposed the vulnerability of public health sector in Pakistan. The virus caused landmark spread as well as increasing death both in general public and health professionals.

The situation in July 2, 2020 has revealed further casualties and infection in all provinces of Pakistan. The government has utilized smart lockdown as means to prevent further spread of the infection. However, due to the lack of public health related behaviors among the provinces, the virus killed and infected more people every day. The province wise breakdown of the infection is shown in Figure 6 and Table 1.

## 7 | CONTAINMENT POLICY

To combat the virus, many containment measures are used with meager resources available, for example, detection, tracking, tracing of contacts, risk communication, social distancing, quarantine, and isolation. Other measures include special arrangements in hospitals in all provinces, such as Punjab, KPK, Sindh, Baluchistan, GB, Islamabad, and Azad Jammu and Kashmir. Standard Operating Procedures (SOPs) were enacted, which would guide state's ministries and public to adopt health-related behaviors as long as the virus prevails in the country. Moreover, isolation wards and quarantine facilities were established as a risk management strategy. The details of province wise hospital and quarantine managements are shown in Figures 7 and 8.

![Figure 3](https://www.zmescience.com/medicine/coronavirus-updates-news-pakistan/)  
**Figure 3** Total no. of deaths in Pakistan. Source: https://www.zmescience.com/medicine/coronavirus-updates-news-pakistan/

![Figure 4](https://www.zmescience.com/medicine/coronavirus-updates-news-pakistan/)  
**Figure 4** Total no. of infected per day in Pakistan. Source: https://www.zmescience.com/medicine/coronavirus-updates-news-pakistan/

![Figure 5](https://www.zmescience.com/medicine/coronavirus-updates-news-pakistan/)  
**Figure 5** Total no. of deaths per day in Pakistan. Source: https://www.zmescience.com/medicine/coronavirus-updates-news-pakistan/
Besides the Government of Pakistan’s provision of health to their public against the virus, majority of the public violated the preventive measures due to many factors, such as poverty, lack of health education, religious factor, culture, and first large-scale encounter with the catastrophic epidemiological situation in the country.

### Study Motivation

The current study motivated me when I observed for over many months, March–July, 2020, about the negligence on the part of general public to consider Covid-19 as a severe risk to their lives and properties. For example, the government’s SOPs were violated in congregational prayers in mosques, wedding functions, market areas, religious ceremonies such as funerals. Against this backdrop, I began to map my mind about what is missing currently, which has given the virus a golden chance to spread among the public in Pakistan. First, I found that there are many barriers to contain further spread of the virus, however, among many barriers, I chose and identified that public risk perception is one that can become the most important preventive strategy and barely missing among the Pakistani public.

### Study Method

For this, to fill the very gap, I studied the available books, journal articles, newspaper articles, and news channels, which enlightened me about many aspects of the Covid-19 pandemic, however, what is largely missing in these sources is what is public risk perception in the case of Pakistan and why it is helpful to make the part of public health policy at state level to minimize the risk associated with the current pandemic and the upcoming infectious disease, both viral and bacterial.

Thus, the present study is based on my own observation, distributing questionnaires and interviews among literate people while using interview solely as means of collecting data from the field to prove and test my hypothesis. In addition, secondary sources were utilized to analyze and interpret to know what other researchers have examined.

### Results

Prior to the results of the current paper, it would be not useless to understand what perception is and why its role is important to contain infectious diseases in Pakistan. In the current study, perception is understood based on the HBM theory. To apply HBM on the current
study, I studied the research conducted by Rosenstock, Stretcher, and Becker on HIV and earlier research studies in the 1950s to prevent TB in the US. Their studies based on HBM identified that people change their health related behaviors when they think risk is imminent.

Similarly, to determine public perception of Covid-19, the current study applied the theory of HBM. Questionnaires were distributed among the prospective respondents such as health professionals and literate non-health professionals in the initial phase—one of the research studies. A total of five respondents were sampled among health professionals. All of the respondents were local physicians. The results showed greater awareness among health professional about the Covid-19 virus (see Table 2).

| Health professionals | Provinces/capital | Perceived susceptibility | Perceived severity | Perceived benefits | Perceived barriers |
|----------------------|-------------------|--------------------------|-------------------|-------------------|-------------------|
| Attendant#1          | Punjab            | Yes                      | Yes               | Yes               | No                |
| Attendant#2          | Sindh             | Yes                      | Yes               | Yes               | No                |
| Attendant#3          | KPK               | Yes                      | Yes               | Yes               | No                |
| Attendant#4          | Balochistan       | Yes                      | Yes               | Yes               | No                |
| Attendant#5          | Islamabad        | Yes                      | Yes               | Yes               | No                |

Source: Field data (May–June 2020).

Health-related behaviors are fair among the health professionals, showing that perception depends on the knowledge about the risk of the disease. Within this context, HBM is applicable, which has already postulated that health-related behaviors depend on when people perceive that the condition is serious; however, it fairly falls down even among the health professional when the condition is not serious.

The study in the second phase collected samples from literate people who were nonprofessional. The findings of this phase revealed similar results in terms of perceiving the Covid-19 pandemic (see Table 3). In the second round of the study, samples were collected from literate people who have indicated that fair level of risk perception prevails among them. This is largely because of where they work and the type of...
environment. In fact, all of them were not similarly engaged in the same profession; however, their sensitivity has revealed that they have fine health-related behaviors compared to the one who is illiterate.

The third phase of the study included illiterate people. No questionnaires were distributed, but only interviews were taken with people of different ages and experiences, such as youths and older people. The perception about the Covid-19 virus has dropped dramatically. The study has found that when they were being interviewed, their behaviors revealed disbelief about the Covid-19 pandemic (see Table 4).

| Literate (non-health professionals) | Perceived susceptibility | Perceived severity | Perceived benefits | Perceived barriers |
|------------------------------------|--------------------------|--------------------|--------------------|--------------------|
| Attendant#1                         | Yes                      | Yes                | Yes                | Yes                |
| Attendant#2                         | Yes                      | Yes                | Yes                | Yes                |
| Attendant#3                         | Yes                      | Yes                | Yes                | Yes                |
| Attendant#4                         | Yes                      | Yes                | Yes                | Yes                |
| Attendant#5                         | Yes                      | Yes                | Yes                | Yes                |
| Attendant#6                         | Yes                      | Yes                | Yes                | Yes                |
| Attendant#7                         | Yes                      | Yes                | Yes                | Yes                |
| Attendant#8                         | Yes                      | Yes                | Yes                | Yes                |
| Attendant#9                         | Yes                      | Yes                | Yes                | Yes                |
| Attendant#10                        | Yes                      | Yes                | Yes                | Yes                |
| Attendant#11                        | Yes                      | Yes                | Yes                | Yes                |
| Attendant#12                        | Yes                      | Yes                | Yes                | Yes                |
| Attendant#13                        | Yes                      | Yes                | Yes                | Yes                |
| Attendant#14                        | Yes                      | Yes                | Yes                | Yes                |
| Attendant#15                        | Yes                      | Yes                | Yes                | Yes                |

Source: Field data (May–June 2020).

| Illiterate people | Perceived susceptibility | Perceived severity | Perceived benefits | Perceived barriers |
|-------------------|--------------------------|--------------------|--------------------|--------------------|
| Attendant#1       | Yes                      | Yes                | Yes                | No                 |
| Attendant#2       | Yes                      | No                 | Yes                | Yes                |
| Attendant#3       | No                       | No                 | No                 | Yes                |
| Attendant#4       | No                       | No                 | No                 | Yes                |
| Attendant#5       | Yes                      | Yes                | Yes                | Yes                |
| Attendant#6       | No                       | No                 | No                 | Yes                |
| Attendant#7       | No                       | No                 | No                 | Yes                |
| Attendant#8       | No                       | No                 | No                 | Yes                |
| Attendant#9       | Yes                      | Yes                | Yes                | No                 |
| Attendant#10      | No                       | No                 | No                 | Yes                |

Source: Field data (May–June 2020).

11 | DISCUSSION

The current paper has used the HBM theory to understand risk perception in the population of Pakistan in every province. The result has identified that risk perception is high in literate people both in health care workers and non-health professionals about Covid-19. Many health-related factors emerged across the population, such as lack of knowledge about the susceptibility, severity, benefits, and perceived barriers among illiterate public who are the bulk of population in rural areas of Pakistan.

However, the results identified fair level of risk perception among literate people, particularly in health professionals. Many factors proved significant. For example, they have fair knowledge about infectious disease, which has fixed in them the belief in susceptibility, severity, and benefits of a viral infection. The experience with the infected cases and the risk associated with the virus are pro-social. This is one and major cause among them, to play a role not only being health ambassador for Pakistan but also for his or her life.

The result of the paper is harmonious with the constructs of HBM. When HBM was developed, which had to increase risk perception among the infected people from TB in the US as well as infection from HIV/AIDS, and ultimately controlled the rate of infection previously successfully. However, little research, particularly in developing countries such as Pakistan where I am observing lack of risk perception of
Covid-19, is missing. This is the reason where negligence and little risk perception have proliferated the virus among the people of Pakistan. The cases are mounting, for example, on February 26, 2020, when only two cases were detected; however, from March to July, the cases jumped to 6000, 5000, 4000 in 20 hrs every day.

Other finding has indicated that the general public has lacked trust in the government to prevent the spread of the virus. When I interviewed both young and older people, they disclosed ideological disbelief in Covid-19. It means that an ideological factor plays the role of catalyst. The general public, particularly the illiterate, trusted more their religion rather than the policies of the government. For example, they violated the SOPs when gathering in worship places, wedding functions, and market areas. It is not an ideology in terms of Pakistan but the government’s strict actions were imposed on the public to abide by the SOPs. The major lack of risk public risk perception was observed in the villages of all provinces of Pakistan. Many factors are responsible to increase risk perception about the virus among villagers are little level of governance, villagers religious perception level, poverty, lack of teaching among the religious figures, called Maulvies, to create higher risk perception among the public though every religion has much about the pandemics.

12 | CONCLUSION

During the Covid-19 pandemic in Pakistan, public health-related behaviors are fair among literate including health care workers; however, the results obtained from illiterate people revealed dramatic differences due to the lack of literacy rate in the rural areas. The Covid-19 pandemic spread to other states via person to person contacts from China. It soon arrived to Iran’s and China’s neighboring country, Pakistan. The spillover effects have exposed Pakistan’s vulnerability in many aspects, such as poor health preparedness against the pandemic and most importantly health-related behaviors of illiterate people, including some literate people. The current study was designed to understand public health perception through HBM theory to test the hypothesis for the sake of theoretical implications.

The study further recommends more research to highlight public health perception as an integral part of the preventive strategy currently and for upcoming epidemics and pandemics. This would give the field of epidemiology to flourish in Pakistan in order to provide the governments full preparedness to combat the microbes, which will reduce both mortality and morbidity among public.

The current study has created novel insights in the current literature, which were previously not considered properly due to the lack of both state and public level attention. Public health behaviors are not specialized in Pakistan; however, the current paper has just advanced theoretical and empirical findings to recommend for policy formulation in the health sector to reduce further loss to the economy of Pakistan.

DATA AVAILABILITY STATEMENT

All the available data in the article is permitted to be published as deemed appropriate.

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