

ORIGINAL CONTRIBUTION

COVID-19, Vaccination, and Conspiracies: A Micro-Level Qualitative Study in Islamabad, Pakistan

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Although vaccination is the only hope to fight against COVID-19, existing vaccine hesitancy is a thought-provoking phenomenon. Significantly, vaccine hesitancy is worsening the situation in Pakistan, leading to an increased number of COVID cases. In this context, this study aims to examine people's perceptions and attitudes towards vaccination. Here the focus was on determining the factors causing disease hesitancy among the masses. The researchers randomly selected a sample of $n=17$ individuals and gathered data by using telephone interviews and assessed data by using the Interpretive Phenomenological Analysis (IPA) approach. Results revealed that the increased vaccine hesitancy is due to misinformation, conspiracies, myths, and rumors about the side effects of the vaccination. It was also notable that the participants indicated digital media as the primary source of information, showing a potential relationship between social media and misinformation. Also, an intense uncertainty about the healthcare system in Pakistan is hindering the efforts to sustain herd immunity. Thus, due to several myths, rumors, and distrust of the healthcare system, vaccine hesitancy is halting the country's ability to overcome the COVID-19 outbreak. Misinformation is vigorously circulating due to ease of access to different communication platforms, instilling fear of presumed side effects. Hence, the researchers suggest some practical considerations for the government, healthcare workers, and media platforms to counteract the misinformation and increase vaccine acceptance among the masses.

INTRODUCTION

After almost two years, the fear and destruction of the COVID-19 outbreak are still looming. One of the critical issues is people's behavior towards the healthcare crisis, indicating disturbed everyday life activities. COVID-19 altered our life patterns resulting in reduced celebratory events and public meetings. However, Pakistan's government constantly struggles to counteract the healthcare, economic, social, and psychological challenges raised due to COVID-19 [1,2]. Along with the

government, researchers are also trying to search for the most suitable techniques to mitigate the looming threat of COVID-19 [3]. Researchers and stakeholders mutually agree that vaccination provides a strong immunity against COVID-19. Many studies show that vaccination is effective, efficient, and helps to keep us from contracting the virus. It is also notable that experts also agree that even if a person gets infected, immunization prevents serious illness among positive individuals [4]. As noted by Pandey et al. [5], vaccines do not ensure and increase immunity at the individual level; instead, they guarantee

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Abbreviations: IPA, Interpretive Phenomenological Analysis.

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community health and wellbeing. Vaccination saves lives by accelerating the body's natural immune system to fight against the virus. When people get vaccinated, the virus transmission is hindered, reducing the virus transmission among the community [6]. Also validated by Simoneaux and Shafer [7], they stated that vaccination inhibits the pathogen spread, which is also known as "herd immunity" or "population immunity." When most people build and sustain this immunity, it also protects the individuals who cannot be vaccinated, especially those who have a compromised immune system.

Moreover, COVID-19 is a severe and self-threatening condition, and there is no way to determine how it can affect an individual. If a person gets sick, they can further transmit the virus to many people. In this regard, both natural immunity and vaccinated-based immunity developed by vaccination can help fight against the risk of virus transmission in the best possible manner [8]. Thus, to find a suitable vaccination against COVID-19 infection, more than 120 vaccine manufacturers claimed to be in the process of developing the immunization. By mid-February 2021, more than 50 vaccine candidates were on the World Health Organization international trial platform [5].

Consequently, today the drive to vaccinate many regions, including Europe, Asia, and the Middle East, successfully meets its goals. These vaccination programs follow the framework proposed by the World Health Organization. This framework mainly involves collaboration, planning, strategies, access, execution, and community engagement [9].

However, there are still many areas where vaccination is facing several barriers due to a national action plan regarding the vaccine rollout [10]. For instance, all the preventive measures, including vaccination rollout, seem to be unsuccessful in Pakistan. According to the General Secretary of Pakistan Medical Association, Dr. Qaiser Sajjad, the government has desensitized people regarding the severity of the pandemic. Political leaders do not always follow standard operating procedures, nor do they always educate the public about the severity of the pandemic. In March 2021, Prime Minister Imran Khan was infected just a day after receiving the vaccination, which further accelerated the misconceptions and vaccine hesitance among the public [11]. Thus, misinformation, rumors, distrust of government policies, and a weak healthcare system are leading causes of hesitance towards vaccination in Pakistan. The government first declared the availability of vaccination in February 2021 across the country after receiving 500,000 doses of the Sinopharm vaccine from China, yet many believed that vaccination could be harmful [12,13].

Notably, the manufacturing and use of immunization also faced many challenges. Researchers faced several

obstacles from development, testing, cost distributions, and logistic matters, but vaccination hesitancy is one of the most significant challenges to attain herd immunity [14]. For many researchers, misinformation is the most prominent concern for an increased vaccine hesitance as it has consistently accompanied COVID-19 since its first outbreak [15]. According to the Pan American Health Organization [16], one of the significant differences between previous endemics and COVID-19 is that now information or news are instantly virtualized through digital media platforms. Despite the ease of access, largely facilitated by people, it also raises many concerns in how to mitigate the impacts of COVID-19. Primary rumors against the COVID-19 vaccination include: vaccination is unsafe as it was developed quickly, altering DNA due to vaccination, including a tracking device, severe reactions, causing infertility among women, and many others [17]. For instance, a renowned columnist and political leader publicly declared the conspiracy that COVID-19 is designed against Muslims to help Jewish people rule the world. Further, he claimed that the vaccine contains a micro-chip to control the individual through 5G towers. These conspiracy theories are under active discussion, hindering vaccine acceptance among people [18]. Hence, in a country where misinformation has primarily affected even healthcare individuals, vaccine hesitancy is not surprising [19].

By keeping in mind the current response to the vaccination process in Pakistan, this phenomenological study aims to analyze the perceptions of everyday citizens regarding the vaccination process. Although many studies examine these perceptions, no investigation has examined the relevant phenomenon qualitatively. Similarly, the researchers gathered responses in a broader context by using face-to-face, qualitative interviews. For this purpose, the study is described in the first section. The researchers discussed the importance of vaccination in the global context and Pakistan's response to the vaccination program, especially the circulating myths and rumors against the vaccination. In the second section, the name, chemical formulation, and the other essential details concerning vaccination and the response of healthcare workers in general and the public, in particular, are highlighted. In the third section, the researchers discussed research methodology and scales and justified the adopted study design. In the fourth section, the researchers have qualitatively analyzed and debated the gathered data. Finally, in the fifth section, the researchers have given practical implications and suggestions to cope with vaccine hesitancy among the public.

VACCINATION IN PAKISTAN

Vaccines protect against neutralizing antibodies.

However, T cells play an essential role in the protective mechanism related to vaccine administration. Vaccines that induce T cell response to cause the formation of antigen-specific memory T cells that remain in the blood for more extended periods and provide immunity against future infections [20].

Notably, Pakistan has actively participated in the clinical trials of the COVID-19 vaccine, initially made by China. In January 2021, AstraZeneca's COVID-19 vaccine, COVAX, was the first vaccine approved in Pakistan. Moreover, the vaccine company's Ad5-nCoV Covid-19 candidate nearly completed Phase III clinical trials [21]. Pakistan has also approved China's Sinopharm, Russia's Sputnik V COVID-19 vaccines, CanSino, and AstraZeneca for emergency use. After Mexico, Pakistan is the second country that supported China's CanSinoBio [22]. During the third wave, while the infection rate increased, rolling cases, and over-burdened hospitals, the vaccination program progresses slowly amidst the limited supplies and deferred deliveries [23].

MASS VACCINATION PROGRAMS

Pakistan had administered 1.3 million COVID-19 vaccines to frontline healthcare professionals and senior citizens free of cost by April 16, 2021. Healthcare professionals were the first to receive the Chinese COVID-19 vaccine in Pakistan [24]. Currently, senior citizens over 65 are getting vaccinated in Pakistan [25]. The Pakistani Government has enrolled senior citizens older than 50 years of age in a mass vaccination program in the next phase. To complete the registration process, residents must send their Computerized National Identity Card number from their mobile phones to #1166, and information regarding the date and vaccine centers is sent via SMS on their mobiles [26].

Pakistan has only administered the Chinese vaccine so far. Additionally, by the end of April 2021, Pakistan had received 6 to 7 million doses of Oxford-AstraZeneca's AZD1222 under the umbrella of COVAX, a global vaccine-sharing initiative with discounted or free doses for lower-income countries [26]. Pakistan has become one of a few countries to involve the private sector to import and sell COVID-19 vaccines. While few private companies and hospitals are in the process of applying for approval and placing orders, pharmaceutical company AGP Pharma has already received 50,000 doses of the two-shot Sputnik vaccine [27]. Despite increasing COVID-19 cases in Pakistan, the vaccine rollout has been progressing much slower due to insufficient funding and a limited supply of COVID-19 vaccines.

Notably, frontline healthcare workers were the first to receive vaccination shots. Overall, people are receptive to mass vaccination. However, conspiracies and hesitan-

cy towards vaccination still exist in remote areas where authentic information regarding proper vaccination is scarce. However, with the involvement of the private sector, the Pakistan COVID-19 vaccination program is expected to pick up the pace progressively over the next few months. Further, the registration for mass vaccinations was based on age in descending order due to the limited availability of vaccines globally [28]. However, with the improvement in vaccine supply and enhanced capacity of units, the categories of the eligible population continued to expand. As of May 16, 2021, registration was opened for all individuals aged 30 years and above [29]. While the vaccination process is currently taking place in Pakistan, vaccines are also being sold in a few cities. According to the Drug Regulatory Authority of Pakistan, the Sputnik vaccine currently costs 12,000 Pakistani rupees (\$80) for two doses, four times the international market price, which is less than \$20 for two doses [27].

VACCINATION AND CONSPIRACIES

Vaccination is one of the remarkable achievements in human history to hamper the morbidity and mortality rates during disease outbreaks. However, different social, personal, cultural, and other factors remain prominent regarding vaccine decisions [30]. As noted by Salmon et al. [31], vaccine hesitancy indicates several uncertainties regarding vaccination. The primary concerns are based on the need for the vaccination, their perceived benefits, and risks. For instance, parental concerns regarding the vaccination process are strongly associated with vaccine reluctance among individuals. Besides lack of knowledge, uncertainty, and subjective norms are other important factors that increase this hesitancy.

Similarly, conspiracies exist almost in every era and during every crisis. They exist for longer periods, even if there is no decisive evidence about them. Conspiracies are formed and prevail when unreliable thinking patterns depend on unreliable ways to track reality [32]. According to Uscinski et al. [33], conspiracy beliefs concerning science, religion, medicine, healthcare, and politics are widely spread and can harm people in multiple ways.

It is notable that there is zero evidence to support any of these beliefs, yet the misinformation still prevails from different resources. Consequently, they undermine the thinking and create uncertainty among the masses about different phenomena. The wider availability of internet-based platforms is further aiding the creation and dissemination of the conspiracies across the globe. Relating to this, Marcellino and their colleagues cited an example of Twitter where messages are shared/posted in written posts, videos, images, and emojis. These posts give special consideration to spread different conspiracies regarding COVID-19, its origins, and vaccination,

which target the other users' re-sharing behavior [34]. As noted by Buturoiu et al. [35], conspiracy against vaccination programs have drastically harmed the efforts to mitigate COVID-19. Online news availability, consumption, claims, and conspiratorial claims are hampering the efforts of healthcare workers and governments to counteract the healthcare crisis. People's belief regarding social media as accompanied by perceived ease of use and usefulness are two critical factors that accelerate their tendency to believe these conspiracies, misinformation, and rumors. According to Ali [36], a significant difference between the current pandemic and previous epidemics is the availability of social media. Accompanied by independent usage patterns, conspiracies regarding the disease outbreak and vaccination are further endangering policies and strategies regarding the mass vaccination programs.

A study conducted by Knobel et al. [37], further validated the role of conspiracies and rumors regarding vaccines in Austria. The researcher executed the case study method and found a strong vaccination hesitancy among the public. Although subjective norms also remained a contributing factor, conspiracy ideation was a prominent reason behind vaccine reluctance. As Ullah et al. [38] argued, besides social media, philosophical beliefs and religious convictions play an essential role in increasing vaccination hesitancy among people. A common misconception regarding "artificial medicine" is that it is less effective than natural herbs. Additionally, a common misconception is that the vaccine contains gelatin from pigs, which is *haram* (forbidden) in Islam; this creates more vaccine hesitancy.

RESEARCH METHODOLOGY

The phenomenological approach is one of the leading techniques in qualitative research that provides an essence of phenomena by investigating from the experience of others who have confronted it [39]. In this regard, the researchers also adopted Interpretive Phenomenological Analysis (IPA) to examine the general vaccination hesitancy resulting from myths, rumors, and distrust of the government healthcare system [40-42]. According to Smith and Osborn, IPA examines how individuals make sense of their social and personal world. Precisely speaking, IPA helps determine how people perceive something and act accordingly [43].

DATA COLLECTION

Using the simple random sampling method, the researchers obtained data from the $n=17$ respondents, confronting myths and rumors about the vaccination, and conducted telephone interviews with them as suggested

by [44]. The researchers ensured the random selection of the participants to avoid any potential bias as also suggested by [45]. Notably, the sample of $n=17$ was ideal as an ideal sample size of a qualitative study should be a minimum of $n=12$ respondents [46]. The researchers initially selected a sample of $n=25$ individuals, however, due to the unavailability of all the respondents, the researchers gathered responses only from the relevant number of respondents.

Furthermore, the respondents were selected based on their availability for the telephone interviews. Judicious prompts of responses such as "what is our perception about COVID-19 vaccination?" ensured the participants would focus on their personal experiences and opinions. Interviews were conducted one by one as the availability of all the respondents simultaneously was not possible. All the responses were saved in written form, and respondents' gender and affiliations were only recorded to sustain their anonymity.

DATA ANALYSIS

The data analysis was based on three stages. After the data collection, first, the researchers carefully examined the data indicating relevance with the asked questions. Second, the researchers carefully noted down all the responses aligned with the gender and affiliation of the respondents to keep an accurate record. The researchers noted that $n=2$ of respondents were male and $n=15$ were female. Most respondents were well-educated and had a strong professional history, ie, university teachers, healthcare workers, and self-empowered homemaker. Finally, at the third stage, the researchers merged all the responses into a single file and carefully summarized them without undermining their integrity or the actual interpretations of the responses.

INFORMED CONSENT

The researchers also gave our respondents the autonomy to quit the telephone interview anytime they wanted. As noted by Flegel et al. [47], informed consent is a vital research ethic that provides the respondents with crucial details about the research, its outcomes, potential influence, and procedures. However, this research does not involve any Institutional Review Board approval as this study does not include any clinical trials. Besides, informed consent was already used, so data privacy and confidentiality were fully ensured.

Similarly, it is also important to mention that $n=5$ items were chosen from different studies witnessing vaccination hesitancy, the role of information resources, the relationship between the healthcare system, and people's general fears about the side effects of vaccination.

RESULTS AND DISCUSSION

Several studies have witnessed the significant physical and psychological issues raised by myths and rumors about COVID-19 and its vaccination. As noted by [48], traditional healthcare measures during COVID-19 can help if rumors and myths do not accompany them. However, sustaining these measures is challenging for several reasons [38,49,50].

PERCEPTIONS ABOUT COVID-19 VACCINATION

Our study respondents revealed their perceptions about the COVID-19 vaccination. According to the respondents, vaccination is an effective measure, yet pharmacists and researchers delayed its execution for unnecessary reasons. Additionally, they believed the vaccination is not strong enough to protect people from the infection, as several people got re-infected after vaccination. However, it is notable that coronaviruses are adopted to destabilize immunity. After vaccination, seasonal disorders can occur, but the effects would be mild due to epidermal immunity, which is poorly protective during the infections [51]. Respondents also expressed their acknowledgment for government and healthcare professionals to start vaccination programs in Pakistan, yet the vaccination might not be as effective as it should be. These results are consistent with the study conducted by Saiful Islam et al. [52]. The study respondents also believed that preventive measures could be a better option to mitigate the transmission of COVID-19. Although the vaccine might help, prevention is better than vaccination.

Similarly, according to some respondents, vaccination can be an effective solution, yet we should consider it the only option to raise herd immunity during the healthcare crisis. Notably, the threshold of herd immunity is attainable only through vaccination. The researchers believe if 60%-70% of the population gets vaccinated, it will increase immunity against the infection [6].

FEAR OF SIDE EFFECTS

Fear of side effects and conspiracy theories greatly halt the vaccination process in developed and developing regions. Achieving herd immunity is impossible until people stop perceiving vaccination as a danger or capable of bringing out serious side effects [53]. Rzymiski and their colleagues noted that myths, rumors, and misinformation about vaccination are a leading cause of vaccine hesitancy among the public. Several scientifically unsupported claims are causing these fears, and people believe vaccinations have a profile of solicited adverse effects [54].

Thus, in the current study, the respondents also indicated their fear concerning vaccination in Pakistan. According to the participants, they fear the side effects of the vaccination as many news reports indicated side effects and conspiracies about the vaccination. Participants also pointed to the development of vaccination in such a short period as also questionable. Notably, the respondents indicated their fear about short-term side effects, yet no one could justify their fears through real-life examples. These results are consistent with the study conducted in Malta, as the people were found to fear the side effects of vaccination in Malta. However, the fear of vaccination was moderate, with more willingness to gather vaccine-related information [55]. Furthermore, despite the fear of side effects, respondents also indicated some support towards the vaccination. Accordingly, participants considered vaccination the only option to mitigate the infection, yet uncertainty and ambiguity were incredibly dominant.

TYPES OF SIDE EFFECTS

A widespread vaccine hesitance or downright rejection is another primary concern after the COVID-19 outbreak. Many countries, including Pakistan, have made vaccination freely available for its people, but perceived side effects are halting the vaccination process [56]. In this regard, the respondents indicated perceived side effects such as fever, flu, nausea, body aches. However, one of the respondents also revealed “blindness” and damaging the “nervous system” as the perceived side effects of the vaccination. However, the clinical trials by the World Health Organization showed that side effects could be mild to moderate lasted no longer than a few days. Common side effects involve headache, fatigue, diarrhea, muscle pain, and pain at the injection site. The chances of the relevant side effects may differ depending on the body type and strength of the immune system [57]. Notably, some respondents also indicated their concerns about side effects based on age. As one of the respondents argued:

“I do, not so much when it comes to youngsters but the elderly. Their bodies can't take as much and the side effects can compromise their health a great deal.”

Government reports and ongoing research studies address COVID-19 vaccination and old age concerns. For instance, the information presented by Australian Government's Department of Health [58], argued that Comirnaty (Pfizer) is safe for the elderly. Currently, Comirnaty is given to millions of people worldwide; as a result, it has lowered the chances of older people getting infected and transmitting the disease to others. It is also important to mention that when a person gets vaccinated with the Comirnaty (Pfizer), its cells instantly read the

mRNA instructions and produce the spike protein. The individual's immune system then recognizes this protein, activates T Cells, and produces antibodies to fight against the infection [59].

Moreover, most participants also revealed "paralysis or death" as potential long-term side effects leading to vaccination hesitancy among them. On the contrary, the clinical trials conducted by the World Health Organization only indicated short-term previously indicated side effects. Yet, none of the cases noted death, paralysis, or a damaged nervous system [57].

SOURCE OF INFORMATION

During the COVID-19 pandemic, there were many sources of information. Despite the official government suggested measures like lockdowns and social distancing, people still rely on conventional and new media platforms to avail themselves of relevant information. Healthcare organizations, government officials, reports, and statutes are also significant sources of information [60]. Hence, in the current study, participants also indicated diverse sources of information, including television, social media platforms, healthcare professionals, and surroundings. However, most respondents revealed social media as the primary source of information during the COVID-19 pandemic. Notably, contemporary trends in mass media raised severe concerns about misinformation, especially during crises. Despite previous studies witnessing traditional media's role in spreading misinformation, the effects were short-term and mitigated shortly. However, the current pandemic is different and comparatively more intense as it is accompanied by misinformation, rumors, and myths spread primarily through social media resources [61].

A higher dependency of the respondents also indicates a potential relationship between social media and misinformation [34,37,62,63]. Previous studies also witnessed the "manageable" outbreak due to limited information sources and a quick filtration of misinformation [61]. As Burki [64] argued, although it is difficult to determine the extent to which social media misinformation affects people's perceptions, online platforms contain many posts that have counterfeit sources. Similarly, the current study participants also reflected their vulnerability to misinformation and believing the online myths and rumors about the vaccination [65-67].

TARGETING ETHNIC GROUPS OR RACES

Myths and rumors about vaccination are not a new phenomenon in Pakistan as the polio vaccination hesitance has been a topic of consideration. During the polio vaccination campaigns, several rumors such as vaccina-

tions are not Islamic (*haram*), they cause impotence, and concerns about poor quality serums remained the main topics. As a result, we witnessed many attacks on health-care workers, polio vaccination team members, health-care centers; all are halting the movement to eradicate polio from Pakistan [68,69].

Likewise, rumors about the COVID-19 vaccination remained evident. As mentioned earlier, the newspaper column by a renowned political leader attributed vaccination to Jewish propaganda against Muslims, resulting in skepticism and hesitancy among the public [18]. Another example can be cited from the statement given by the former foreign minister of Pakistan, Abdullah Hussain Haroon, by sharing a WhatsApp message. According to Hussain Haroon, COVID-19 is not natural; instead, it was created by the United Kingdom, United States, and Israel to harm fast-emerging China. He claimed that the virus is a chemical weapon from America against Syria [70]. Thus, to account for this claim, the current study involved a question regarding respondents' perceptions of believing any relevant conspiracy. However, a majority of respondents denied these conspiracies. According to one of the respondents:

"Well, Pakistan is a country where misinformation and conspiracies spread easily. Here the example of polio vaccination cannot be denied. So I believe that these are just rumors, and it is not against any group."

In the above response, the participant attributed the relevant possibility to misinformation and mentioned the polio vaccination's case to strengthen the argumentation further. Similarly, another respondent said:

"Absurd totally, you know! If it's targeting ethnic groups, it shouldn't be universally applicable in every corner of the world, either affected or not affected. I hope it clears."

Therefore, despite many rumors and myths against the COVID-19 vaccination [16], all the respondents in this study explicitly denied potential conspiracies. Denial of conspiracies can positively impact people's overall perceptions regarding immunization, leading to an increased acceptance among them [58].

TRUST LOCAL HEALTHCARE SYSTEM

With a population of nearly 227 million people, Pakistan has a weak healthcare infrastructure, indicating insufficient capacity to confront the COVID-19 crisis. Initially, the lack of quarantine centers, protective equipment, and black-marketing of facemasks and hand sanitizer reflected the insufficient local healthcare system [71].

In this context, increased distrust of the healthcare system can be a potential reason behind vaccine hesitancy. As Chandir et al. [72] attributed Pakistan's healthcare system to "mixed health systems syndrome" due to insufficient healthcare planning, crisis management system, financing, service delivery, and human resource management.

Thus, by keeping in mind the existing challenges for the health system in the country, the researchers asked participants whether and to what extent they trust the local healthcare system and services. All the participants precisely indicated a strong distrust of the local healthcare system. They indicated bad governance leading to inadequate healthcare facilities for the masses. Once again, the respondents criticized infrastructure, financial resources, technology unacceptance, and lack of credible stakeholders and policymakers. According to one of the participants:

"Trust is something different. We are a part of a system that lacks basic infrastructure and implementations of public-friendly policies. Money-making is the primary concern for the stakeholders rather than empathy for the patients. Trusting the healthcare system is much questionable. Besides, the rise of COVID-19 unveiled all the weaknesses in our healthcare system. Frankly speaking, no, I don't trust it because policymakers and stakeholders are indifferent about its betterment, so how can I trust?"

Notably, Pakistan is a developing country with minimal resources. Even macro-level outbreaks (endemics) in the past (polio, leprosy, tuberculosis, measles, dengue, typhoid) challenged the local healthcare system; the issues raised by the COVID-19 pandemic is not surprising [73]. Butt and their colleagues noted that immunization programs have always been largely unsuccessful in Pakistan due to weak healthcare policies and implementation strategies. These failures of immunization programs both in the past and during the COVID-19 have increased concerns towards the healthcare system [74]. As a result, we have seen high mortality rates, leading to an increased distrust towards the local healthcare system, hampering the vaccination process in Pakistan [18].

PRACTICAL IMPLICATIONS AND STRATEGIC CONSIDERATIONS

If we do not address vaccine hesitancy effectively and in a timely manner, it can halt the progress of healthcare programs and create enormous challenges to eradicate the disease. Vaccine hesitancy adversely affects the strategic implementation of the program and overall immunity levels [75]. For example, the execution of the Extended Program for Immunization (EPI) to eradicate polio from Pakistan remained unsuccessful due to solid vaccine hes-

itancy and low interest of the Federal Government. As a result, the polio outbreak is still a looming threat, especially in the northern frontier province of Pakistan [74].

Similarly, vaccine hesitancy due to myths, rumors, conspiracies, misinformation, distrust on the local healthcare system, and fear of the side effects create several fallacies about the vaccination. Vaccine hesitancy appears to be an imminent threat which compromises reduction of disease transmission [14]. Further validated by Asad and their colleagues, they also witnessed a majority of respondents expressing uncertainty regarding vaccination, eventually deciding against it. Thus, by keeping in mind the vaccine hesitancy revealed by the respondents, the current study suggests some practical implications, equally applicable for the local government, healthcare professionals, and social institutions including media platforms [76]. As argued by MacDonald et al. [77], a proper understanding of the reasons and people's attitudes towards vaccination can provide in-depth consideration for the policymakers, immunization program administrators, healthcare workers, and researchers. For this purpose, taking the following essential points under consideration can bring fruitful outcomes. Notably, these strategies are also supported by existing literature to obtain a strategic approach to counteract vaccine hesitance across the globe. These implications mainly involve the following in Tables 1, 2, and 3.

CONCLUSION

The second and third-wave of COVID-19 continue to wreak havoc on social, economic, and healthcare systems worldwide. In such a devastating situation, vaccination is the only hope to halt the virus transmission. However, information resources, social, and personal factors play an essential role in decision-making regarding vaccination acceptance. Anti-vaccination conspiracies and controversies primarily lead to vaccine reluctance among the masses. Existing stereotypes and exposure to mainstream media are among the factors that halt vaccine implementation.

This current research is a micro-level qualitative study that indicated people's concerns regarding vaccination due to lack of knowledge and unauthentic information causing vaccine hesitancy in Pakistan. Results suggest that immediate healthcare programs, community engagement, and access to reliable information resources are the first priority. Although the researchers did not find any relatable concern regarding vaccines targeting specific ethnic groups or races, the role of social media as a significant source of information and further lack of trust in the local healthcare system are some major considerable issues.

Thus, it is crucial to address the concerns related to

Table 1. For Government Officials and Policy Makers

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- 1 The government should create some community engagement programs that may educate the public about the importance of vaccination. For example, a few months ago, the mass immunization campaign “Typebar T.C.V.” in Lyari Town, Karachi, depicted a massive engagement from the public. As a result, many people got vaccinated, which also affirmed the importance of mass vaccination programs to eradicate vaccine hesitancy [78].
 - 2 Social Mobilization campaigns, especially in remote areas, are in need today. For this purpose, tactical strategies can help increase the social mobilization process [78].
 - 3 Families play an essential role in the vaccination-related decision-making process. In this regard, if the government initiates community awareness through different social institutions, they can help the families to get vaccinated. As both father and mother are significant components of the family, they can make a favorable decision and require the other members to get vaccinated as well [74].
 - 4 The sale of vaccines should be banned, and people need to be immunized based on their eligibility and priority. Additionally, the government of Pakistan should redouble its efforts and take necessary measures before anti-vaccine rumors penetrate the local community [12].
 - 5 The registration mechanism should be rapid and efficient enough to immunize such a large population. Regarding vaccine administrations, concerns should be proactively addressed, and misconceptions should not be permitted to prevail [12].
 - 6 Bring necessary improvements to the local healthcare system and focus more on building trust in the healthcare system. As noted by [13], it is essential to pay attention to our shabby and depilated healthcare system, which may also reinforce the public to take every possible measure to halt the outbreak.

Table 2. For Healthcare Professionals

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- 1 Healthcare professionals and policymakers should come forward to educate the public about the significance of vaccination to hinder virus transmission.
 - 2 Given that concerns related to side effects are the primary reason behind vaccine hesitancy, demand is demanded to reassure the public about expected side effects [76].
 - 3 Develop new action plans that may facilitate vaccine acceptance by keeping unique characteristics and considerations under consideration [79].
 - 4 Make sufficient efforts for trust-building and informing the public about the potential misinformation regarding the vaccine in general [79].
 - 5 Healthcare professionals, especially senior doctors, should introduce new strategies to address vaccine hesitancy in Pakistan effectively. In addition, they should also consider the conventional methods of public awareness, as although the outbreak is recent, hesitancy has always existed in Pakistan [74].
 - 6 Studies show that emphasizing only population benefits when communicating with the public is insufficient. Keeping individual services under focus is also much important. The previous endemic also validated that keeping personal benefits under focus is an essential technique for effectively engaging the individuals were to vaccinate themselves [79,80].

Table 3. Media Platforms

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- 1 Media platforms can play a significant role in decreasing vaccination hesitancy as the role of both conventional and new media platforms regarding the “infodemic” is undeniable. Relevant guidelines can be taken from a study conducted by Cinelli and their colleagues, as they also utilized media platforms to increase vaccine acceptance in the United States [81].
 - 2 Media-based healthcare advertising campaigns can also reinforce vaccination acceptance among the public. For instance, a study conducted by [82] also witnessed media advertising campaigns raising COVID-19 awareness in Jordan, highlighting the significant role of media platforms in increasing healthcare awareness.
 - 3 Notably, digital media has revolutionized the world by connecting the masses and spreading information. Although misinformation is primarily attributed to social media, the government, policymakers, healthcare professionals, and others should resort to online platforms and ensure the transmission of accurate information that can also decrease vaccine hesitancy [83].
 - 4 Media researchers and practitioners should actively participate in the policymaking process by suggesting validated approaches and strategies enhance the media’s role in spreading vaccine-related awareness. As mass media platforms are highly accessible, this accessibility can effectively mitigate the current healthcare crisis [44,83].

vaccine hesitancy among the public to mitigate the impact of COVID-19. The availability of vaccines in Pakistan is a positive sign to create herd immunity; however, hesitancy is halting the outbreak. This is mainly due to ease of access to different communication platforms, misinformation about vaccination vigorously circulating, and instilled fear of presumed side effects [84]. This situation needs stronger efforts to diminish conspiracy theories, myths, and rumors about vaccines to increase acceptance.

LIMITATIONS AND CONTRIBUTION

This study has some significant limitations. First, this study represents the perceptions and opinions of people living in Pakistan, which questions the generalizability of the results. Second, unlike other investigations, it comprises a qualitative technique that further narrows its scope. Third, this study involves only five questions. However, there could be more queries that may examine the perceptions in-depth. Nevertheless, although it is a micro-level study, it is of greater significance, especially for the readers, healthcare professionals, and policymakers, to cope with vaccine hesitancy in general.

RECOMMENDATIONS FOR FUTURE RESEARCH

The researchers recommend more investigations to examine people's perceptions regarding vaccination to determine the mechanisms behind vaccine hesitancy. Mainly, a macro-level study to explore these reasons will be helpful to eradicate misinformation, myths, and rumors, leading to increased vaccine acceptance among the masses.

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Appendix A

Questionnaire

Name: _____

Age: _____

Gender: _____

Q1: What are your perceptions about Covid-19 vaccination?

Q2: What do you think about the side effects of the vaccination?

Q3: In your opinion, what can be the side effects of the vaccination?

Q4: What is your primary source of information, and why?

Q5: In your opinion, whether and to what extent Covid-19 vaccination is targetting some particular ethnic group or race?

Q6: What is your opinion about the local healthcare system? Do you trust its ability to counteract the healthcare emergency?
