

Vaccine Hesitancy among University Students: A Qualitative Study in Makran Division, Balochistan

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Abstract

Although the government of Pakistan applied several undesirable consequences for the unvaccinated citizens, a very small portion of the population is fully vaccinated till now. That is very less as compared to its neighbouring countries such as China, Iran, and India. The most important reason of less number of vaccinated people is vaccine hesitancy in the country. The current study tried to know the reasons of vaccine hesitancy among undergraduate students in Pakistan, especially in Makran division. Balochistan has very little data regarding vaccination but vaccine hesitancy is worsening the situation. This research was conducted among the university students in Makran Division of Balochistan to find out the situation of hesitancy between both medical and non-medical students. The research focused on their ratio and the other basic causes of vaccine hesitancy. This study was both qualitative as well as quantitative in nature. The data were collected by developing interview schedules contained both structured and semi-structured questions. The participants were selected through purposive sampling techniques. After collection of data, the collected data were put in SPSS software and frequency, and percentage of data were drawn and also thematic analysis was used for qualitative data. The results found that the vaccination rate between medical and non-medical students was not that different. The outcomes of the study suggested that there were different causes of vaccine hesitancy, such as lack of knowledge, wild rumours and lack of trust among people regarding vaccination. It is recommended that the policy makers and government should develop trust among youth about COVID-19 vaccination.

Keywords: COVID-19 Pandemic; Vaccine hesitancy; University students; Makran Division

Introduction

In March 2020, Coronavirus Disease 2019 (COVID-19) was declared a pandemic by World Health Organization (WHO). Since then, over 423 million confirmed cases have been recorded and 5.9 million deaths are witnessed (WHO, 2022). Such a huge increase in cases proves the transmissibility of COVID-19. It can easily be transmitted through respiratory droplets, mainly by coughing, and environmental contamination. Environmental contamination means the release of any hazardous material in the environment that is a threat to the wellbeing of the living things. Touching a contaminated surface speeds up the spread of virus from one person to another. The transformability of the COVID-19 at an alarming rate across the globe is a challenge to the world.

COVID-19 is highly transmissible, so strict measures have been taken by public health bodies, like World Health Organization (WHO), to prevent it from spreading. These measures caused lockdowns all over the world and that brought massive losses to the complete humanity in many ways. All the countries were in battle to develop a vaccine for COVID-19. On 8th December 2020, a UK grandmother, Margreat Keenan of 91, became the first person in the world to be given the Pfizer COVID-19 jab as part of a mass vaccination program (BBC, 2020).

Even though vaccine was developed, the distribution of the vaccine wasn't equal in all the parts of the globe. With the passage of time, under-developing and developing countries got vaccine from organizations and developed countries, but as usual vaccine hesitancy became a barrier. Vaccine hesitancy is not new to the world. It started soon after the introduction of the smallpox vaccine in the late 18th century (Succi, 2018). The world had to deal with this barrier. In November 2011, WHO organized a group, Strategic Advisory Group of Experts (SAGE) on Immunization, in order to study and solve the problem of vaccine hesitancy. SAGE defined vaccine hesitancy as "Vaccine hesitancy refers to delay in acceptance or refusal of vaccines despite availability of vaccine services" (SAGE, 2014). Studies show that there are various factors that cause vaccine hesitancy in different regions of the world, but the most vulnerable sectors included: younger generation, women and people who were less educated, had lower income, had no insurance, living in a rural area, and racial minority (Cascini et al., 2021).

Moreover, the scenario will be worst if the educated sector of a society is resistant or hesitant towards COVID-19 vaccines. Several studies from different parts of the globe show that the rate of vaccine hesitancy/refusal among the university students massively differs from region to region. For instance, in UAE, only 67% of the university students, both medical and non-medical, were vaccinated (Nizam et. al., 2021). A study on a French university found that 58.0% were ready to get vaccinated; the remaining were either hesitant (25%) or resistant (17%) (Tavolacci, Dechelotte & Ladner, 2021). The results are alarming in African countries, such as Nigeria. In Nigerian universities the acceptancy of vaccine was recorded $34.70 \pm 5.00\%$,

both among staff members and students; vaccine hesitancy was reported $65.04 \pm 5.00\%$ (Uzochukwu et. al., 2021).

There are various factors that cause vaccine hesitancy/refusal among the common masses or the students. Some factors are providers' lack of technical knowledge, existing patriarchal societal norms and critical views of vaccine by naturopaths and homeopaths (Nair et al., 2021). Lack of knowledge regarding vaccine could be a key factor for vaccine hesitancy. The ones who carry knowledge about vaccines are more likely to accept it. A survey in Italy found that 91.9% of undergraduates were keen to receive COVID-19 vaccine. This was because, more than 80% of the participants knew all about COVID-19 vaccine administration, functioning, and effects on community health (Gallè et al., 2021).

Pakistan is among those countries where wild theories about vaccines can be heard from all sectors. Vaccine hesitancy is the reason that makes Pakistan among the only two countries where polio is endemic (WHO & GPEI, 2022). Vaccine hesitancy is very high in Pakistan as the prevalence of vaccine refusal was recorded 40% (Ansar et al., 2021). Pakistan is a multicultural country where several communities with various beliefs inhabit. A large portion of the population, around 60 million, is illiterate (Visit website <http://mofept.gov.pk/>). Balochistan, being the least literate province, has the literacy rate of 43.58% (The Balochistan Voice, 2017). The least literate province is probably going to be the most hesitant to COVID-19 vaccine.

This research surveyed the 8th most literate division, Makran (Maqsood, 2022), of Pakistan, focusing the university students, medical and non-medical both. Aim of the study was to find out the ratio of vaccine hesitancy among medical and non-medical students, the reasons behind the hesitancy and the proper measures that could help to overcome these barriers.

Problem Statement

Vaccine hesitancy is an issue that may become a barrier to eradicate any pandemic. There are many factors that cause vaccine hesitancy but the biggest problem is when the educated sector of a society also isn't completely convinced for the vaccination. A review of fifteen studies all around the globe shows that around 86.1% of students accepted COVID-19 vaccine (Troiano & Nardi, 2021). Vaccine hesitancy among the university students is not less than a menace, because the educated sector of the society has to lead the upcoming generations.

This research was aimed to detect the root causes of vaccine hesitancy among university students in Makran, where very little literature is available. Moreover, it scaled the ground level ratio of refusal and hesitancy for the authorities to know the reality. After knowing the reality, they can implement suitable measures to convince the population for vaccination.

Research Objectives

1. To identify the causes of vaccine hesitancy among university students of Makran Division
2. To know vaccine hesitancy gap between medical and non-medical students of Makran Division
3. To map a direction for the provincial and federal government to eradicate vaccine hesitancy among youth in the country.

Research Questions

1. What is the extent of knowledge and awareness of undergraduate students regarding COVID-19?
2. How are the socio-religious factors, peer pressure and wild rumors contributing to COVID-19 vaccine hesitancy among undergraduate students of Makran Division?
3. What were the role of health practitioners and educational institutions in controlling COVID-19 vaccine hesitancy among undergraduate students in Makran Division?

Review of Literature

Al-Mulla et. al. (2021) conducted a research that found vaccine programs had been started throughout the world for having control over COVID-19, but in Qatar vaccine hesitancy remained a barrier to have control over pandemic. The universe of this study was the students and employees of Qatar University. The study was conducted in order to check the attitude of students and employees of Qatar University toward COVID-19 vaccine. There was an online cross-sectional study in February 2021, in which 231 students and the same number of employees participated. As a result, the percentage of participants who were willing to get vaccinated was 62.6%. Secondly, those participants who were with or currently doing their post-graduation showed more willingness as compared to bachelor degree holders or currently pursuing their graduation. On the other hand, the male members had a greater number of vaccine acceptance. The study further found that the participants were too much concerned about the vaccine side-effects for their own and also their family's health. The collected data found after the national vaccination programs that vaccine hesitancy exists and continues in Qatar population.

Tavolacci, Dechelotte & Ladner (2021) held a research among university students in France to know the level of COVID-19 vaccine acceptance, hesitancy and resistance. Secondly, the research aimed at finding out the reasons, motivations and barriers toward COVID-19 vaccination. The study was conducted through an online observational cross-sectional study

among the students of France University in January 2021. 3089 students were taken for the survey and they were questioned against COVID-19 vaccine in order to explore the motivations and barriers toward COVID-19 vaccine. The study found that 58.0% of students reported to be vaccinated, 17.0% were not willing and the remaining 25.0 % were not sure about getting vaccinated. Further, it was reported that those participants who were ready to take vaccination uttered that they did not want to spread COVID-19 to others. Secondly, the rest of the participants who were hesitant and resistant toward COVID-19 vaccine said that they would wait to have more experiences with these new vaccines. The study further found that those students who were more close to science and studied science courses and healthcare courses were more hesitant and they developed a thought that vaccines were risky for their health. Besides, those who had self-estimated knowledge of conventional vaccines and COVID-19 vaccine were more confident and thought of vaccine as a safety and showed lower risk of vaccine hesitancy and resistance.

Hamdan et. al. (2021) conducted a research among the students enrolled at the American University of Beirut. The aim of this research was to know the behaviour of university students toward COVID-19 vaccine. 3805 students were randomly selected for the survey in order to check their attitude toward COVID-19 vaccine. These students were surveyed about COVID-19 vaccine and different results were highlighted. The first thing was to categorize the participants into three groups. In the first group those participants were included who were accepting vaccine. Second was the group of those who were hesitant toward vaccination. And the other was the group of resistant participants. All of the participants' behaviour was analysed and the final data collected found that vaccine accepting participants were 87%. And vaccine resistant and hesitant were 10% and 3%, respectively. Further, it was found that the less hesitant participants accepted vaccine since they thought of COVID-19 vaccine safe for their health. On the other hand, those participants who were more hesitant toward COVID-19 vaccine were among those who did not receive the flu vaccine. They had a fear of getting health issues from COVID-19 vaccine. These factors show that there is a great need of increase in the rate of COVID-19 vaccine.

Galle et. al. (2021) had held a research which was conducted to check the undergraduates' level of knowledge and their responses about the acceptance of COVID-19 vaccine. This study was conducted among the Italian undergraduates during the first phase of immunization plan. A web-based questionnaire was created for surveying the students. The students who were currently pursuing their degrees in Bari, Naples and Rome universities were surveyed during February to April 2021 for this study. The study analysed their responses about vaccine acceptance. A total of 3226 students were the part the survey. Among them, 91.9%

participants showed willingness to get vaccinated. These participants were surveyed and asked various questions related to COVID-19 pandemic and its vaccination. Luckily, more than 80% correctly answered the questions about COVID-19 vaccine, administration, functioning and effects on community health. The study further explored that participants had knowledge about the COVID-19 and vaccine because of which a great number of participants showed willingness to be vaccinated without hesitation. Secondly, the participants previously had vaccination against influenza (OR 3.806, CI 95% 1.81-12.267; $p=0.025$) and knowledge (OR 4.759, CI 95% 2.106-10.753; $p=0.000$). On the other hand, there were 68.8% who knew the right composition of the available vaccines. These results showed that the population had a great level of awareness about COVID-19 vaccination.

Ansar et. al (2021) found that the pandemic had created global healthcare and economic crises. But, vaccine plays the best role to solve this issue. The study is based on evaluating and uncovering the barriers/hurdles which stop Pakistani population from getting vaccinated. There was a cross-sectional study in which 855 respondents were included. Through the cross-sectional study, the participants' knowledge about COVID-19 infection, intent of vaccination and barriers toward vaccine refusal were checked. Further, in order to calculate frequency and percentages of collected data, descriptive statistics were utilized and chi-square test was used for cross tabulation. The study found lots of barriers and reasons of not accepting COVID-19 vaccine. The barriers include vaccine is not Halal, negative propaganda on social media against vaccine, discouraging advices from social circles and late adverse reactions. Secondly, one third of the study population did not consider COVID-19 as a serious disease and associate it with conspiracy theory. The prevalence of vaccine refusal was 40%. The study found that within Pakistani population vaccine refusal was too high. There must be more and more awareness campaigns regarding COVID-19 vaccine importance and advantages. The religious and social barriers must be discouraged in this regard.

Saied et. al. (2021) conducted a research in order to discover the level of COVID-19 vaccine hesitancy; the factors and barriers which affect vaccination decision making. The study was conducted through a cross-sectional study among medical students in Tanta and Kafrelsheikh universities, Egypt. Data collection was done through an online questionnaire during January 2021. 2133 students were surveyed for this study. The collected data found that most of the participants (90%) learned the importance of the COVID-19 vaccine. The percentage of vaccine hesitant participants was 46%. Further, majority of the students were too much concerned about their health because of its negative effects (96.8%) and in ineffectiveness (93.2%). The most common hurdle that stopped people to get vaccinated was lack of data regarding the vaccine negative effects. Finally, the government, health authorities, decision

makers, medical experts and universities in Egypt need to work and do their best to reduce vaccine hesitancy and to spread awareness about vaccination.

Nizam et. al. (2021) held a research to explore the attitude and hesitancy of university students in UAE toward the COVID-19 vaccine. The study also focused on comparing the behaviour of both medical and non-medical students against the vaccine. Their study was web-based, students of different universities were sent the questionnaire, and their data were collected using questions regarding their behaviour. The participants in their survey were 385, of whom 76.6% were only females. 67% of the total participants were vaccinated, most of whom had taken Sinopharm (70.4%). The most common reason for vaccine refusal was "Concerns over side-effects" (58.7) among both vaccinated and unvaccinated students. The study revealed that students with medical and health sciences background (58.7%) disagreed more than the non-medical students on the belief that vaccine could completely protect them from COVID-19. Thus, the study found that COVID-19 vaccination rates among the university students of UAE were lower than that of national average. So, programs related to vaccine awareness for students, especially medical students, are required to ensure a better future of the nation of UAE.

Methodology

Research Design

As the objectives of the study were both exploratory and confirmatory, this study was conducted by a combination of qualitative and quantitative methods. The mixed method was required for survey research to find out the ratio of vaccine hesitancy between medical and non-medical students. It focused on the behaviour and the reasons why the educated sector was reluctant and hesitant towards COVID-19 vaccines. This study was conducted to find out the root causes of vaccine hesitancy among students. On contrary to this, it was confirmatory in nature that uncovered whether the university students were hesitant towards COVID-19 vaccines or not, and the extent to which they were hesitant. Using a mixed method allows the research to be more effective and have a better understanding of the issue.

Universe of the study

The universe of the present study was university students, both medical and non-medical students.

Sampling Technique

The sample for this study was the students currently enrolled in the public higher educational institutions such as University of Turbat both Main Campus and Panjgur Campus,

Makran Medical College (MMC) Turbat, University of Gwadar (UoG), and Balochistan University of Engineering and Technology (BUET), Sub-campus, Turbat. For finding the ratio of hesitancy, a hundred medical and non-medical students were surveyed. These participants were selected through purposive sampling technique.

Sample Size

The sample size of the current study was 100 students who are currently enrolled in different degree programs in University of Turbat both Main Campus and Panjgur campuses, University of Gwadar, Balochistan University of Engineering and Technology, Sub-campus, Turbat. The participants were male and females as well as medical and Non-medical students. This study uncovered whether the future doctors were hesitant or not, as compared to the students of other disciplines of higher education.

Procedure

The study was completely anonymous. We asked for the willingness of the institutions first and then the participant's. They were given a questionnaire of 15-20 questions. First, questions were about whether they were vaccinated or not; if vaccinated, whether they did it hesitantly or willingly; if not vaccinated, whether they had planned for it or not. This pattern let us know the percentage of resistant, hesitant and willing students; it also explored the causes of resistance, hesitancy and willingness as well. We combined all the data from both medical and non-medical students and the collected data uncovered the answers of the problem statements.

Tools for Data Collection

A structured questionnaire with close-ended questions was developed and this questionnaire was used in printed form, and also a semi-structured questionnaire with open-ended questions was used for collection of qualitative data.

Methods for Data Collection

The survey method was used for data collection among the university students in Makran Division.

Data Analysis method

Statistical tools and simple frequency tables were used for analysing the quantitative data and thematic analysis was used for qualitative data.

Results and Findings

This study was held to find out how serious the undergraduate university students of Makran Division were regarding the COVID-19 pandemic and its vaccines. The participants of the study were taken from five different higher education institutions in Makran division: University of Turbat, Makran Medical College, Turbat, University of Gwadar, Balochistan University of Engineering and Technology, Sub-campus Turbat and University of Turbat, Panjgur Campus (Recently, upgraded to University of Makran, Panjgur). This study was both qualitative and quantitative, conducted to get to the core causes of vaccine hesitancy among educated sector of Makran by using the structured and semi-structured interview schedule. The research has gone through randomly selecting students from all of these institutions to capture the true mind-set of the students and their knowledge about COVID-19, its vaccines and more importantly the causes of vaccine hesitancy among them.

The results of the study showed that the vaccination was imposed in many ways, because the students had little knowledge about what vaccines were. The students from medical backgrounds had fair knowledge about the pandemic and the vaccines. They mostly knew a lot about the administration and functioning of vaccines as compared to the non-medical students. The more knowledge someone had about the pandemic and its vaccines, the more welcoming they were to the vaccines.

Knowledge

Being a pandemic, COVID-19 turned the pace of the world order. It has changed the course of the global economy, bringing political and economic crisis to every state on the globe. Like every other state, Pakistan has also suffered drastically due to the pandemic. Owing to this, the researchers have tried to explore the knowledge and perception of undergraduate students of Makran division regarding the vaccine hesitancy. It was administered using open-ended questions to the university students, enrolled in BS, MA or MSc, and MBBS. Students from variety of educational backgrounds were interviewed and it was found that medical students had a clear understanding of the pandemic and its vaccines but non-medical students mostly lacked the knowledge. Many students of the public universities were as knowledgeable as the medical students, because they were enrolled in medical related departments: Botany, Biochemistry and Biotechnology. A student from University of Turbat explained COVID-19 and its vaccines respectively:

COVID-19 is a virus that spread from Wuhan city of China in 2019. It is a novel virus that affects the lungs, more specifically the respiratory system of the human beings. Vaccine was the biggest challenge that the overall world was facing. As the virus was spreading fast, every developed country was using different technologies to develop its vaccine. But unfortunately,

COVID-19 was changing its mRNA structure with the passage of time. So, the vaccines that were produced should also change according to the virus because vaccines are also developed from virus. There are many vaccines of COVID-19. Sinopharm and Sinovac are developed in China and Moderna and Pitzer are most probably developed by Western countries. Some of them are very expensive and some are easily accessible.

In comparison to the non-medical students, medical students from Makran Medical College, Turbat had much more knowledge about the pandemic and its vaccines. In an interview with a male MBBS student, he explained:

COVID-19 vaccine helps people to boost their immune system. Our immune system gives two responses, one is primary and the other is secondary response. When for the first time a disease attacks our body the body gives late response against the disease which is primary response while the other time the disease enters our body the immune system is boost up and alert, if we are vaccinated that means our primary response is done and immune system is strong.

But, the students who were enrolled in social sciences had little knowledge about the pandemic and its vaccines. Although most of them were vaccinated, they did it because they were forced by their institutions. A female student was asked about the reason of getting vaccinated. She said, "Yes, I'm vaccinated. I did it because University of Turbat notified us that unvaccinated students could not enter the university or take exams. I was compelled to go for it."

Hence, the university students lacked the basic knowledge about the world changing pandemic and its remedy, except the ones with medical backgrounds.

Barriers to Vaccination Process

Vaccines are prepared to get control over viruses and refusing them causes more stress, health risk and death chances. Vaccine is a protection or safety that fights against viruses. Further, accepting the vaccines reduces the chances of spreading the pandemic to other individuals while refusing it easily transfers the pandemic to others. The current study discovers that barriers largely exist in the vaccination process of COVID-19 vaccines in Makran division. The barriers include social factors, religious factors, rumours and peer pressure.

Wild Rumours

The rumours largely circulate especially on social media and these rumours are basic reasons of refusing COVID-19 vaccines. The rumours include more health risk, birth of other diseases, inability to produce children, Western conspiracy and propaganda against Muslim world. Due to lack of knowledge and awareness, the individuals easily opposed the vaccines and believe on rumours instead of ground realities.

Some of the non-medical respondents explained that vaccine is a conspiracy to control the population and it causes infertility. A respondent in the interview explained, "Rumours were too much about the vaccines. They said it can cause infertility or it kills after two years of vaccination. People thought vaccines were a tool to control population."

A medical student of Makran Medical College expressed, "The rumours on social media and other platforms were the factors which demotivated the people from accepting the vaccine."

From these all responses, it can be concluded that rumours had been rooted deep down within the society. And it was possible because the common people had no awareness or knowledge regarding vaccines. They were all dependent over social media and the social gossips. This thing not only caused refusal among the uneducated sector, but it also affected the educated part of the society.

Religious factors

The medical and non-medical respondents' opinions varied from person to person regarding the religious factors that caused vaccine hesitancy. However, medical students had more knowledge and information regarding the religious factors and a very little number of non-medical students could explain regarding the religious factors. Those non-medical students explained the religious factors that include, foreign conspiracy and propaganda. A male student from University of Turbat, department of political science, expressed his thoughts by saying:

The religious factors may be so as when the pandemic emerged many religious people considered it a myth and an international conspiracy against the Muslim world. The Mullahs named it propaganda that was created by Western world in order to minimize the population of Muslim world.

The medical students actively explained the various religious factors that caused vaccine hesitancy:

There may be a number of religious reasons which caused vaccine refusal. As when the pandemic was in its peak, there were some restrictions on Friday prayers, going to Hajj and so on. And there were some people who were religious extremist and they considered it a European conspiracy. Therefore, religious sectors did not accept the vaccines. On the other hand, the main cause behind this was lack of education and awareness.

Lots of other medical students considered religious extremism, lack of knowledge regarding vaccines, Western policies and conspiracy, the causes behind vaccine hesitancy.

Peer pressure

Peer pressure also exists among people of Makran division that caused vaccine hesitancy but a very few number of students considered it a cause of hesitancy among people. Only the medical students mentioned it while talking about the major causes of hesitancy. A male medical student expressed, "The peer pressure is a major social factor that caused vaccine refusal. Secondly, the rumours like getting more diseases, dying after some times and many other are also the causes of refusing vaccine."

He had a solid thing to say. People are highly affected by the people with whom they spend their time. When someone from a class has bad feelings about a vaccine, they force their other classmates to avoid the vaccines as well.

Social factors

A large number of participants from medical and non-medical colleges and universities of Makran division elaborated their opinions regarding social factors. The opinions of both medical and non-medical students were not much different regarding the social factors that caused vaccine hesitancy. Most of the non-medical students explained that one of the major social factors was that the vaccines cause death and health issues after some times, which compelled the students to remain unvaccinated. As a male medical student expressed his views, "Social factors could be the wrong way of interpretation of the news. Everyone in this society thought and spread the news that vaccines cause impotency. Vaccination was considered a tool to stop the population growth."

According to many students, the social factors causing vaccines hesitancy include fake information from social media and lack of knowledge. As a medical student expressed regarding lack of knowledge and awareness about vaccines, "COVID-19 is not taken seriously in this society. Many people here don't even believe in it, so how can they believe in the vaccines? People here thought that COVID-19 is a way to extinguish the Baloch culture and its norms. They thought that it was a plan to bring distance between the Baloch or simply the Muslim people."

Vaccine refusal is highly controlled by the social status, education level and the long lasting norms a society owns. People get easily affected by the posts or comments they see everywhere because they themselves lack any opinion or awareness.

Consequences of Vaccine Hesitancy

Vaccine hesitancy is not less than a menace. It is common within the uneducated sector of every society but same is the case for educated sector, especially among students. The researchers interviewed the students about the consequences of vaccine hesitancy. Every

student had a different point of view in this regard. For example, in an interview with a male student, he declared:

When individuals don't accept the vaccines suppose they get affected by COVID-19 then it causes serious health issues. If he/she is young and has strong immune system, he/she may recover but it would cause serious health issues to those who are aged and having weak immune system. It can even cause their death.

Many students believed that the best way to safety is following the SOPs, even if you are not vaccinated. They thought being vaccinated might be the cure but prevention is better than cure. Some students saw the refusal as a barrier to the career. As a student from University of Turbat agreed, "For students, vaccine refusal might not be good as we were not allowed in the university. And the unvaccinated students could not apply for the foreign scholarships. Other than that, there is no consequence of vaccine refusal." Thus, everyone had different opinions on this issue.

Role of Healthcare Workers

Vaccination is the only remedy against the spreading pandemic and awareness needs to be spread to the common people by the knowledgeable sector of the society, the healthcare workers. Makran is a place where the upcoming youth is serious about their education, otherwise the common people are mostly illiterate and they have no knowledge about what a pandemic is and how it is dealt with. They all need to be educated about these things before convincing them for vaccination. When students were asked whether healthcare workers contributed to the vaccination process, the researchers got various responses. A MBBS student claimed, "COVID-19 is a sudden virus and our healthcare workers mostly lack knowledge about it. So I feel they have done nothing in the process of vaccination in Makran division."

Many of the students had good words for the healthcare workers. A male MBBS student said, "I feel healthcare workers have contributed in this regard. They have visited the places where no one goes, they have covered schools and hospitals. They have even given their 100%." So, the point of views changed from person to person regarding the healthcare workers and their role. They were praised by many of the students. For instance, a female student from a village quoted, "Healthcare workers played their role bravely. When everyone was quarantined in their homes, they were the ones to make sure that the people of their town are vaccinated. In our village the healthcare workers themselves collected our CNIC numbers and sent them to Turbat City for bringing vaccines for our village. It is a great contribution that they did for our village."

But, overall it was found that majority of the students believed the healthcare workers were limited to hospitals. They did what they had to do, but only by being limited to the vaccination centre. They didn't have a proper way of bringing awareness among the people. They were like a shield for the ones who visited them; on the other hand, they had no strategy for the majority who were refusing the vaccines.

Role of Institutions

The role of higher education institutions of Makran division cannot be ignored in the process of vaccination. They remained closed for combating the pandemic and when they reopened, in most of the cases, they notified their students that unvaccinated students weren't allowed in the university. A female student from University of Turbat mentioned, "I'm vaccinated just because of the notice of my university. We were strictly forced for vaccination. The unvaccinated students were not allowed to sit in exams, so we did it."

Another MBBS student said, "We were instructed to be vaccinated from the administration of our college. And they also installed a camp for the vaccination of the students." The institutions did everything for making sure if their students were vaccinated. The students were strictly notified for vaccination, though there were no awareness campaign about the pandemic and the vaccines in any of the institutions.

Discussion

The study demonstrates that vaccine hesitancy is rooted in Makran division, even among university students. From a total of a hundred participants, (39%) showed hesitancy to COVID-19 vaccines, though majority of them were vaccinated. Majority of the unwilling students were vaccinated due to strict measures taken by their institutions. Overall, medical students showed more willingness (74.20%) to vaccines than the non-medical students (55.10%). The major cause of vaccine hesitancy was a lack to awareness or knowledge regarding the vaccines, which was supported by wild rumours, social and religious factors.

The results show that the rate of vaccine hesitancy is highly related to the knowledge regarding the infection and its vaccines, as reported in a similar study (Jain et al., 2021). It was found that acceptability of vaccine among undergraduate students was (61%) which is very less as compared to the undergraduate students of Italy (91.9%) (Gallè et al., 2021) and also that of the university students of Lebanon (87%) (Hamdan et al., 2021). On the other hand, it is higher than that of university students of Jordan (34%) (Sallam et al., 2021). Among all the participants, medical students were more willing (74.20%) due to the wide range of knowledge that they had. Only (55.10%) of non-medical students were willing, which is very less for the

educated sector of a society. It was noted that a large number of non-medical students could not even name a single COVID-19 vaccine. Lack of knowledge is a key cause of vaccine hesitancy in Makran division. Due to no knowledge, people believe in the rumours they hear or see everywhere.

It was also found, with the help of the students, that there were some other factors causing vaccines hesitancy, such as wild rumours, peer pressure and religious influences. These are different from the major causes of a similar study which nominated younger generation, women and people who were less educated, had no insurance, living in a rural area were hesitant (Cascini et al., 2021). Wild rumours can never be ignored when it comes to be hesitant or refusal to vaccines. Such things are supported by a lack of awareness campaigns regarding demerits and benefits of vaccines. Majority of the participants (74%) of our study claimed that their major source of information regarding COVID-19 and its vaccines was social media. Misinformation circulating through media and Internet manipulated the African's mind that they were being experimented by the powerful Western vaccines (Aborode et al. 2021). (20%) of our participants said that their source of information regarding COVID-19 was print and electronic media and only (3%) reported that healthcare workers were their source of information. This is very less in comparison to a similar study which states that the most common sources of information (36%) were awareness campaigns and medical staff respectively (Alabbad et al. 2018). The more one gets dependent on social media, the more they spread unauthenticated news. Internet and social media give everyone an open hand to communicate anything without any proof and such misinformation spread fast and cause vaccine hesitancy to a larger scale.

Medical students were expected to be much more welcoming to vaccines than the non-medical students, but vaccination gap among them was not considerably large. The first study to find COVID-19 vaccine hesitancy among USA medical students showed that almost all respondents had positive attitudes regarding the vaccines (Lucia Kelekar & Afonso, 2021). On contrary to this, our study found that 8/31 (25.80%) of medical students were still unwilling to get vaccinated between September and October, 2022. By now, the other parts of the globe have welcomed vaccines practically; in contrast, our undergraduate students still hesitate though they claim how important vaccines are.

Conclusion

Vaccines are a type of cure for a virus and COVID-19 vaccines also helped in controlling the pandemic. This study was conducted among both medical and non-medical students of Makran division of Balochistan. It aimed to find out the vaccine hesitancy among the students of

higher education of Makran Division. As there were a large number of people who believed on rumours rather than COVID-19 throughout Pakistan, many people, even the educated sector, resisted the vaccines. There were different perceptions of people regarding the vaccines and their disadvantages. Vaccine hesitancy was largely caused due to wild rumours and some other social and religious factors. A lot of respondents considered the pandemic a myth. Such behaviour and perceptions of people compelled us to conduct the research and know the causes of vaccine hesitancy among university students of Makran division, Balochistan.

The present study showed that there was a large number of university students in Makran Division who did not accept the vaccines, though majority of them were vaccinated. The medical students had great knowledge about the vaccines, its functioning and benefits; therefore, they accepted the vaccines more. Further, it was explored that the medical students were very close to medical knowledge that provided them information. But, most of the non-medical students had less information about vaccines. They mostly believed on fake information which they had heard from the common people. A large number of medical students willingly accepted the vaccines and considered it a safety and protection; whereas, many non-medical students accepted the vaccine because they were compelled and forced by their institutions. Secondly, the low level of knowledge of non-medical students resulted in believing the rumours. The research examined that the healthcare workers contributed somehow at the time of pandemic when it was in its peak but most of the healthcare workers were only limited to the hospitals and could not contribute in eradicating vaccine hesitancy. The educational institutions played their role to defeat the pandemic as they remained closed and when they reopened there were strictness in following SOPs.

The results of the study confirmed that vaccine hesitancy among the educated sector seemed to be a motivation for uneducated people to reject the vaccine. When the educated sector of a society is unaware about the vaccines, it will be tough to convince the uneducated people for accepting the vaccines. This research contributes in highlighting the vaccine hesitancy among the university students of Makran Division, Balochistan and also enables people to understand the knowledge gap between the medical and non-medical students regarding COVID-19 vaccines. Further, the research convinces the people regarding the acceptance of COVID-19 and controlling the pandemic. It also discusses the causes of vaccine hesitancy among university students of Makran Division. On the other hand, this research discusses the role of provincial and federal government both in eradicating the vaccine hesitancy among the youth in the country.

There should be such more research in future through which it might become possible to eradicate high rate of vaccine hesitancy and low level of knowledge regarding COVID-19 and its

vaccines. The educated sector, especially the students must spend most of their time on studying to get more knowledge about such issues and pandemic rather than believing on rumours and myth. On the other hand, the best role can be played by the policy makers who can arrange seminars, campaign and sessions with the help of which they can provide awareness to the citizens regarding such pandemics.

Recommendations

1. The first and the foremost thing a common person can do is to believe that COVID-19 really exists. If they believe in it, then they can go for its remedy. And as it is a virus that is always going through the process of mutation, it is not easy to find its cure easily. But the vaccines are a controlling tool for the virus. If one refuses the vaccines, then everyone will get a motive to refuse it. People need to take it seriously for the protection of themselves, their families and also their surroundings. Vaccines are a source to help the people, and they need to accept it without any fear. It is a protection from a deadly virus.
2. Another way to safety is following the SOPs. The more one keeps social distancing, hygiene and wear masks, the more they keep themselves and their surroundings safe. COVID-19 is a highly transmissible virus and that is the reason it spread all over the globe within a few months, despite the lockdowns everywhere. When someone wears a mask, they make their surrounding safe by not sneezing or coughing in the air. In the same manner, when someone washes their hands regularly with soap, they kill the virus before it gets attached to other objects or people.
3. COVID-19 is a concern of the complete globe. It has caused millions of deaths, affecting several countries massively. It has brought economic and political crisis in several countries, causing inflation and unemployment in a larger scale than ever. Such a deadly pandemic cannot be controlled by individuals; it needs collective efforts by the governments in collaboration with international organizations. A government has power over its citizens, so it is the duty of the government to eradicate such a pandemic.
4. Pakistan is a country with a literacy rate of only 64%. Millions of people in Pakistan have never been to an educational institution. They are completely cut from the rest of the globe. If the citizens of a country are unaware about the happenings in the world, it means they have no idea about the pandemic and its vaccines. They lack knowledge about the pandemic and its vaccines; therefore, they refuse the vaccines by considering the rumors everywhere. Now it becomes the duty of the government to educate its people about the pandemic and vaccines, so that they willingly vaccinate and support the process of vaccination.

5. The best way to educate an illiterate surrounding is to hold campaigns and programs about the benefits of vaccination and the harsh effects of the pandemic. If the Government takes this problem seriously by arranging campaigns in schools, colleges and higher education institutions, the youth will get rid of the rumors and understand the mechanism of vaccination. Thus, awareness compels them to trust the vaccines and make others believe in it effectively.

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