Factors Influencing Vaccine Hesitancy and Strategies to Address It: Evidence from COVID-19 Vaccination

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Abstract. The COVID-19 pandemic has made people pay more attention to vaccination for prevention and control of infectious diseases. Although many people in China have been vaccinated against COVID-19, the problem of vaccine hesitancy has not been solved. Currently, the results are scattered. Based on the case of COVID-19 vaccines, this paper will explore the main reasons for vaccine hesitancy and put forward possible countermeasures. Based on the above, it can be concluded that people are concerned about the safety and efficacy of vaccines. Misinformation spreading via social media and the Internet, as well as media coverage of vaccine-related events and public trust in the government, health institutions and pharmaceutical companies, are also factors that may influence people's decision to be vaccinated. In previous research, it has been found that women, people with lower incomes, those with lower levels of education, and some ethnic minorities are more prone to vaccine hesitancy. However, vaccine hesitancy is different in different areas and cultures, and also changes over time during the pandemic; thus, the results may not be generalisable. Future studies will explore the reasons for vaccine hesitancy in different cultures and develop more effective health communication and intervention strategies to encourage more people to get vaccinated and improve public health.

Keywords: COVID-19 vaccine; vaccine hesitancy; misinformation; public trust; public health.

1. Introduction

Since the start of the COVID-19 pandemic in late 2019, there have been significant changes to the health system and society around the world. The pandemic has shown that vaccines are to be used to prevent and control the spread of infectious diseases. Vaccines can activate the immune system to produce protective antibodies and immunological memory in the body to reduce the risk of infection, serious illness and death. Widespread vaccination will also help to achieve herd immunity and protect the vulnerable group of people. Although COVID-19 vaccines have shown good results, the rate of vaccination in some areas has been low. Vaccine hesitancy is a problem in public health around the world that has led some people to postpone or refuse vaccinations despite the availability of vaccines [1].

Vaccine hesitancy is a problem in public health that affects people's awareness of diseases and their own health. Previous research has consistently found that worries about the safety of vaccines and potential side effects are one of the main reasons for vaccine hesitancy. Kricorian and others have found that after the emergency use authorisation (EUA) of COVID-19 vaccines in January 2021, only 41% of the surveyed U.S. adult population believed the vaccines were safe; the rest expressed worries or had no opinion [2]. In addition, some studies have suggested that the very fast development and approval of COVID-19 vaccines have raised people's worries about their long-term safety and efficacy [3,4]. The above results show that there are still doubts about the rapid progress of vaccine development among people who do not take vaccines.

There are problems with vaccine safety; now, spread of false information has also begun to cause reluctance to get vaccinated. With the spread of the Internet, false or inaccurate vaccine information can spread widely on social media platforms and be easily confused with accurate scientific facts by the public. Studies have shown that people who are based on false or unscientific health information are more likely to have negative attitudes towards vaccination [2,5]. In addition, extensive media reports on side effects of vaccines may make people more fearful about vaccine safety and thus choose not to get vaccinated [4].

Demographics and Socioeconomic Factors are related to Vaccine Hesitancy. Studies have found that women, people living in rural areas, individuals with lower levels of education and lower incomes are more concerned about the safety of vaccines and are more reluctant to be vaccinated [2,6]. Health literacy, culture and trust in the government, health institutions and vaccine manufacturers are also reasons that affect people's acceptance of vaccines [4]. Taken together, the above results suggest that vaccine hesitancy is caused by the combination of people's own traits, the social environment, and the overall structure. Vaccine hesitancy will have some serious problems for the people and society. Lower vaccination rates increase the risk of an outbreak of infectious diseases, it is difficult to achieve herd immunity, and thus the disease will continue to spread in the community. Therefore, the mechanism that people are hesitant about vaccines in order to design good public health measures that can increase vaccination rates and enhance public confidence in them.

This paper takes the COVID-19 vaccination as an example to investigate the reasons for vaccine hesitancy, such as concerns about the safety and effectiveness of vaccines, false information, media influence, loss of trust in the government, changes in demographics, etc. It will also discuss the potential negative effects of vaccine hesitancy and present some evidence-based ways to boost people's acceptance of vaccines. Through the study of relevant research, this paper hopes to better understand vaccine hesitancy and provide new ideas for future public health work.

2. Factors Influencing Vaccine Hesitancy

2.1. Safety and Efficacy Concerns

People are still concerned about the safety and effectiveness of vaccines; thus, they are reluctant to be vaccinated. Although there has been strong support from all sides showing that COVID-19 vaccines can prevent infection and serious illness, there are still doubts about their safety and long-term protective effects among the public. Troiano and Nardi have found that, for some people, one of the reasons they did not get the COVID-19 vaccine is fear of the unknown regarding its long-term effects [3]. With the rapid development and widespread distribution of COVID-19 vaccines, some people did not have enough time to assess their long-term safety and were therefore reluctant to be vaccinated.

The same problem has also arisen in other places and among other groups. Dror and others have found that both healthcare workers and the general public in Israel have been concerned about the potential risks of the rapidly developed COVID-19 vaccines, which is related to a high level of vaccine hesitancy [1]. Similar Patterns have also appeared in the United States. Kricorian and others surveyed 1,950 American adults, and after the COVID-19 vaccines received Emergency Use Authorisation (EUA), only 41 per cent of the people were sure that they were safe; more than half were either concerned or uncertain [2]. It was also found that people with less education and income were more likely to have negative opinions about vaccine safety and were easily misled by false information. Thus, the idea of vaccine safety is likely one reason why people are reluctant to be vaccinated. There are also worries about the safety of vaccines in the choice of childhood vaccinations. Ruiz and Bell found that about 28.9% of parents were reluctant to get their children vaccinated for COVID-19, and the main reason for this reluctance was safety concerns, not doubts about the effectiveness of vaccines [7]. Schilling and others also found that parents from low-income and minority families are more worried about the possible risks of vaccines. Many of these parents thought that the chance of severe COVID-19 in children was relatively small and thus did not believe they needed to be vaccinated [8]. Thus, the parents are less willing to have their children vaccinated.

In short, worries about the safety of vaccines are still a reason for vaccine hesitancy among all age groups. To promote the use of vaccines, it is necessary to enhance the public's understanding of vaccine safety and build confidence in scientific evidence.

2.2. Misinformation and Social Media Dissemination

With the spread of the Internet and social media, many more people have gained access to health information. At the same time, these platforms have also promoted the spread of false information and rumours. Misinformation about vaccines that has spread on the Internet is one reason for vaccine hesitancy. Garrett and Young pointed out that the World Health Organization has named vaccine hesitancy as one of the foremost issues in global public health, and misinformation is one reason why it has been so persistent [5]. False information about adverse reactions to vaccines, conspiracy theories and other unsubstantiated medical facts have been spreading online, leading to people's fear of getting vaccinated.

Previous studies have shown that false information is also a reason for people's negative attitudes towards vaccination. Kricorian and others have found that people with little knowledge about COVID-19 are more susceptible to believing vaccine myths and think that the vaccines are not safe [2]. In addition, if people do not know how to verify the credibility of health information, they may be easily persuaded by false information online.

In addition to the content of health information, the source of that information can also affect people's willingness to get vaccinated. Sieber and others have surveyed more than 10,000 primary care patients in the United States to find that people who mainly obtain their health information from social media, religious organisations or family and friends are more likely to be vaccine-hesitant. On the other hand, people who thought that healthcare institutions and medical professionals were their primary sources of health information were more willing to get vaccinated [9]. Based on the above results, it can be concluded that people's attitudes towards vaccines are influenced by information sources' trustworthiness. Therefore, there will be more doubts among the public about the vaccines due to the spread of fake news. Therefore, it is necessary to strengthen science-based health communication and improve people's ability to evaluate the accuracy of information in order to reduce vaccine hesitancy.

2.3. Media Influence and Public Trust

During the COVID-19 pandemic, the media have become a primary source of health information for the public. As a result, the media coverage has had an impact on people's views of COVID-19 vaccines. Although news reports helped increase people's awareness of the pandemic and vaccination, many frequent reports about vaccine side effects and adverse reactions also made people anxious. Paris et al. found that the willingness of healthcare workers in France to receive the AstraZeneca vaccine dropped from 74.8% to 58.3% after widespread media coverage of adverse events after vaccination [6]. Therefore, the extent of media coverage will alter people's sense of danger from vaccines and their intention to get vaccinated.

Besides the effect of media, people's trust in the government, health institutions and vaccine manufacturers may also motivate them to get vaccinated. Troiano and Nardi found that a reason for the reluctance to accept the vaccination was distrust of public health institutions and doubt about the developers of vaccines [10]. If people do not trust the openness of the institution or doubt the accuracy of the information it provides, they will be reluctant to take the vaccine despite evidence that it is safe and effective.

Therefore, to increase the number of vaccinated people, trust is virtually important. The government and health authorities should release correct and timely information, strengthen communication with the public, help people form a reasonable view of the advantages and potential risks of vaccination, etc. These measures will reduce the anxiety of the public and thus encourage them to be vaccinated.

2.4. Demographics and Socioeconomic Conditions

In addition to the issues of vaccine safety and the spread of false information, people in different groups of the population have different attitudes towards vaccination. Based on previous research, the will to accept vaccination among the public is correlated with various factors such as age, gender,

ethnicity, education level, income, etc. Caiazzo and Witkoski Stimpfel found that younger adults, women, Black and Hispanic populations, and some groups of healthcare workers were more hesitant about vaccination [4]. Therefore, despite the availability of good health services in China, there are still differences among different groups in their attitudes towards vaccines.

All other research has come to the same conclusion. Kricorian and others have found that women and those living in rural areas are more concerned about the safety of COVID-19 vaccines. They also found that people with a lower level of education and income were more likely to have negative opinions about vaccination [2]. These groups are also more susceptible to false information and thus have increased vaccine hesitancy.

Demographics and socioeconomic conditions of the parents also affect their choice of children's vaccinations. Ruiz and Bell found that mothers and guardians of minor children, single-parent families, lower-income groups and those with relatively poor educational levels were less likely to get their children vaccinated for COVID-19. Parents affiliated with the Republican Party were also more reluctant to have their children vaccinated [7]. Schilling and others have examined the circumstances of 50 low-income families in six areas of the United States, most of which are Hispanic (64 per cent). Only 38 per cent of the parents said they would take their children for vaccination, and most were uncertain or hesitant [8]. Therefore, it can be concluded that parents with socio-economic disadvantages are more likely to be vaccine-hesitant.

3. Conclusion

Through the case of COVID-19 vaccination, this review examined the main reasons for vaccine hesitancy and proposed some possible ways to increase people's acceptance of vaccines. Overall, based on the available evidence, people's fears about the safety and efficacy of vaccines are still the primary reasons for vaccine hesitancy. Misinformation, media reports on adverse events of vaccines, and a loss of public trust in the government, health system and vaccine companies are also reasons why people do not get vaccinated. The results also show that the attitude of people towards vaccinations differs among different demographics and economic circumstances, and more people are reluctant to get vaccinated, especially women, people with lower incomes or education, and certain racial and ethnic minorities.

This paper shows that vaccine hesitancy is no longer just a problem in medicine but should be regarded as an issue affecting the entire public's health due to various reasons in society and culture, education, communication, etc. To raise vaccination coverage, it is necessary to have safe and effective vaccines, enhance public health education, deal with the spread of fake news, build trust in health authorities, and so on. The evidence presented in this review can help us better understand the reasons for vaccine hesitancy and guide the design of more targeted health education and vaccination promotion programmes.

There are many reasons why people are hesitant about vaccines, such as different areas, different cultures and the spread of diseases. Therefore, the results of this review may not be the same for all groups of people and places. In the future, more research should be carried out on how vaccine hesitancy manifests in different cultural contexts, and new ways of communication and intervention should be developed. With the development of social media, which has started to alter people's thoughts, in the future, some research will focus on reducing online false information and improving health awareness.

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