OPEN ACCESS Freely available online

Journal of Infectious Diseases & Preventive Medicine

Research Article

Risk Perceptions and Attitudes Towards Influenza Infection and Influenza Vaccine among the General Public of Pakistan

Candella Abril*

Department of Infectious Disease, National University of Rosario, Rosario, Argentina

ABSTRACT

Purpose: Pakistan, including China and the United States, was severely affected by the rise of seasonal influenza in 2018. In the year 2020, Pakistan Medical Association has expressed concerns over the increasing influenza cases in different regions of Pakistan and has urged the general public to get influenza vaccine among other precautionary measures. However, traditional norms, high cost and low levels of education prevented people from getting influenza vaccination. Therefore, there is a need to assess the risk perceptions and attitudes towards influenza infection and influenza vaccination among the general public of Pakistan.

Methods: This multi-centered, cross-sectional study was conducted in three metropolitan cities of Pakistan. Four hundred and two participants took part in the survey using non-probability convenience sampling. The target population was males and females of age>15 years. Descriptive statistics were followed by the odds ratio analysis.

Results: The public (n=402) with risks perceptions (notably, serious effects on health (OR=5.2, $p<0.05$), and severe influenza outbreak (OR=7.1, $p<0.05$)); and attitudes towards influenza infections (influenza out of control (OR=3, $p<0.05$), and influenza may extend for a long time (OR=3, $p<0.05$)), were strongly convinced to go for the influenza vaccination. In addition, government and doctors' recommendations (OR=6, $p<0.05$), were found significant to urge public to take influenza vaccination.

Conclusion: Though the odds ratios are high for the public ready to take influenza vaccine in influenza season or outbreak, efforts are required to convince those who do not intend to take it and are unaware of the risks associated with contagious influenza infection. The government should promote knowledge and understanding of the risks associated with influenza infection by developing public awareness programs and supporting physicians in recommending influenza vaccination among the general public.

Keywords: Attitude; Influenza; Risks; Vaccine

INTRODUCTION

According to the World Health Organization, seasonal influenza causes approximately 290,000 to 650,000 respiratory casualties and about 3 to 5 million cases of severe illness globally. The consequences of seasonal influenza epidemics in developing countries are not fully known, but research suggested that 99% of deaths in children under the age of 5 with lower respiratory tract infections associated with influenza were reported in developing countries. However, in developed nations, influenza is the major cause of death among people of age 65 or older. The seasonal outbreak of influenza also results in high number of worker and student absenteeism, leading to loss in productivity and overcrowding of clinics and hospitals around the world. According to the study conducted on influenza vaccine coverage rate and perceptions on vaccination in South Korea, influenza caused critical consequences in both healthy individuals and people with any co-morbidity, leading to severe consequences such as hospital admissions. Healthy people when caught with influenza suffer from high grade fever, headache, and muscle pain whereas, elderly people or patients with multiple diseases or multiple clinical manifestations, are more susceptible to influenza, and may decease due to pulmonary collapse. Clinical course of influenza differs by many factors

Correspondence to: Candella Abril, Department of Infectious Disease, National University of Rosario, Rosario, Argentina, E-mail: Candelabri@gamil.com

Received: 25-Mar-2022, Manuscript No. JADPR-22-17170; **Editor assigned:** 30-Mar-2022, PreQC No. JADPR-22-17170 (PQ); **Reviewed:** 19-Apr-2022, QC No. JADPR-22-17170; **Revised:** 25-Apr-2022, Manuscript No. JADPR-22-17170 (R); **Published:** 02-May-2022, DOI: 10.35841/2165-8056.22.10.263

Citation: Abril C (2022) Risk Perceptions and Attitudes Towards Influenza Infection and Influenza Vaccine among the General Public of Pakistan. J Infect Dis Preve Med. 10: 263.

such as age; immunity of the body; prevalent influenza strain and its characteristics such as epidemiological behavior; presence of another disease; and pregnancy. The foremost compelling way to prevent healthy body from influenza is to immunize with influenza vaccines or influenza shots but due to changes in the antigenic sites in influenza virus, vaccines are prepared after the forecast of several influenza antigenic varieties such as trivalent vaccines containing influenza A(H3N2), pandemic A(H1N1) and one influenza B virus or quadrivalent vaccines including both subtypes of influenza A and both types of influenza B lineage viruses (Victoria and Yamagata).Findings of the meta-analysis and systematic review on global burden of respiratory infections due to seasonal influenza in young children showed that 99% deaths among children of younger than 5 years were caused by influenza related lower respiratory infections commonly seen in developing countries. Influenza vaccines, however, have demonstrated safety and efficacy, they are hardly used in developing countries due to lack of annual reformulation and yearly vaccination. In addition, most of the developing countries severely lacked the infrastructures needed to provide immunization facilities to older adults and to the public with chronic diseases. For instance, a review conducted in 2013 by Gavi, the Vaccine Alliance, identified many challenges in implementing influenza immunizations in developing countries, notably lack of awareness about influenza infection among stakeholders, lack of influenza disease burden data, technical issues providing immunization services, and significant uncertainty of vaccines impact on important health outcomes. Generally, developed countries have higher vaccination coverage than the developing countries ranging from 1% to 75% in vulnerable groups. For example, the European region's vaccination target was 75%, but only the Netherlands and the United Kingdom were able to achieve the target in older groups in the recent years. Similarly, the United States' vaccination coverage was 62.6% among children, against the national target of 70%. Influenza vaccination coverage in developing countries, contrary to developed countries, are very low despite of the WHO's recommended coverage targets of 75%. For example, Asia, with almost half of the world's population with a larger proportion of developing countries than in the West, is significantly vulnerable to influenza due to varying climatic regions that facilitate the constant survival and transmission of different influenza strains all year round in certain regions. Further, literature describing attitudes and behaviors towards influenza vaccine is hardly available for many Asian countries, specifically, Bangladesh, India and Pakistan. Influenza epidemics and pandemics continue to be a huge burden in these countries with limited or unavailable literature on influenza vaccine uptake attitudes. Pakistan has no influenza vaccine policy and the rate of immunization is suboptimal. Influenza vaccine coverage across countries varies due to the risk perceptions and attitudes of the general public towards influenza infection and influenza vaccine. Mostly, individuals with little awareness and negative attitude towards influenza immunization are hesitant to be vaccinated. It is important, however, for all stakeholders, especially the general public, to understand the consequences of influenza outbreak and its prevention using influenza vaccines to strengthen national security and pandemic preparedness. With general populations having the lowest vaccination uptake rate in Asia, and Pakistan sorely lacking the literature on the influenza immunization attitudes among the general population, this research asses the risk perceptions and attitudes among the general public of Pakistan towards influenza infection and influenza vaccine and their intention to receive influenza vaccination for upcoming influenza seasons.

Panorama of influenza disease and influenza vaccine in Pakistan

The influenza infection began to spread among the population of Pakistan in the beginning of June 2009 when influenza A (H1N1) pdm09 virus was reported in four young individuals who had a travelled back to Karachi from the United States of America where they developed influenza like illness (ILI). Altogether, suspected cases with ILI were 1242, out of which 262 were H1N1 confirmed laboratory cases. Deaths reported due to H1N1 were 29, with 15 males and 14 females. Most of the cases were reported from Punjab (35%), followed by Islamabad (30%), Sindh (majority from Aga Khan University Hospital, Karachi, 27.8%), and Khyber Pakhtunkhwa (Peshawar, 5.4%). During 2009-2010 pandemic period, Influenza A (H1N1) pdm09, in Pakistan, was the predominant strain. Resurgence of influenza A (H1N1) pdm09 cases were reported in 2011, A(H3) was predominated in 2012 season, whereas in 2013, surge of influenza B cases were recorded, and again in 2014 and 2015-2016, influenza A (H1N1)pdm09 was the predominant strain. The 2015–2016 influenza period was not severe as compared to the past seasons in Pakistan as vaccines were available to combat the burden of influenza. Twenty eight people died in 2015 by influenza A(H1N1)pdm09. Samples were taken from around 300 individuals during the 2016 season out of which 110 samples declared positive of influenza. Fifteen deaths were recorded in Punjab and one was from Khyber Pakhtun Khwa and Islamabad each. In 2017, around 1500 suspected cases and 45 deaths due to influenza-A (H1N1 pdm09) were reported from different parts of Pakistan [1].

MATERIALS AND METHODS

By employing multi-center, cross sectional study design, the study was conducted in three metropolitan cities of Pakistan, namely Islamabad, Karachi and Lahore from October 2018 to May 2019. The target sample of males and females of age>15 years were recruited using convenience sampling. Convenience sampling was used to easily contact the citizens when and where available. For example, the respondents were approached at different places such as colleges, universities, hospitals and shopping malls. Data were collected through a pre-validated and self -administered questionnaire (see Appendix), extensively used

in various researches across the world for knowing the perception of public on influenza infection and influenza vaccine. The questionnaire included items on demographics, behavioral responses to influenza outbreak, risk perceptions and attitude towards influenza infection, attitude towards influenza vaccine, and intention to receive influenza vaccination in future. Following the descriptive analysis, associations of age, gender, risk perceptions and attitude towards influenza infection, and attitude towards influenza vaccine with the intention to get influenza vaccination in future was conducted using binary logistic regression [2,3].

Ethics approval

Permission to conduct this study was obtained from the Institute of Business Management, Ethics Review Committee (ERC) on 6 September 2018. The Ethics Approval Number is MHM-EA-01-FH-18/09. The ERC can be contacted at mrcquery@gmail.com. Data were collected with the consent of respondents, assuring privacy and confidentiality of their responses.

RESULTS

Descriptive analysis

Total 402 responses received from the three metropolitan cities, namely, Karachi, Lahore, and Islamabad. Most of the responses were from Karachi which is the most populated city of Pakistan. The characteristics of the participants are listed in Table 1. Majority of the respondents were of the age group 25-34 years, university graduates, employed, and were living with parents. Around 60% of the respondents did not receive any seasonal influenza vaccine. The most common behavioral changes to the influenza outbreak found were washing hands, followed by cleaning or disinfecting things of usage (Figure 1).

Gender	Frequency (n=402)	Percent
Male	187	46.5
Female	182	45.3
Not Specified	33	8.2
Age Group (years)		
18-24	72	17.9
25-34	182	45.3
35-44	62	15.4
45-54	32	8
55-64	13	3.2
≥65	10	2.5

Table 1: Demographics of the participants.

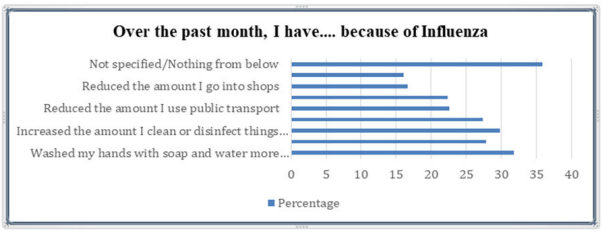

Figure 1: Behavioral response to Influenza outbreak.

Inferential analysis

The odds ratio analysis is presented. It was found that the crude odd ratio of IRV for gender is not significant, implying that both male and female have equal likelihood of being vaccinated. Moreover, the association between age and IRV was assessed by using dichotomous variables for each age group. The findings indicated that the age groups had equal likelihood of being vaccinated ($p>0.1$).

In addition, the association between IRV and RPAI as showed, suggested that the public who perceived themselves and other people at risk of catching influenza were 2.5 times more likely (OR=2.47, 2.599, $p<0.0001$) to go for vaccination than those who did not. Furthermore, the public who believed that the influenza would have serious effects on their health were 5.2 times more likely ($p<0.0001$) to get influenza vaccine than the respondents who perceived the effects on health as non-serious. Similarly, the public who perceived influenza outbreak serious were 7.2 times more likely ($p<0.0001$) to opt for influenza vaccine than those who perceived the outbreak as non-threatening. Further, people who were unable to comprehend the outbreak situation, perceived that the outbreak may continue for a long duration and believed that influenza is out of personal control were almost 3 times more likely (OR=2.78, 2.98, 3.04, $p<0.0001$) to go for the vaccination than those who had negative views. However, the respondents who were able to acknowledge the role of authorities in controlling the outbreak were 1.7 times more likely ($p<0.05$) to be vaccinated than their counterparts with opposing views. Therefore, these results imply that risks perceptions and the negative attitudes towards influenza infections strongly convinced public to go for the influenza vaccination.

Furthermore, the results in Table 2 showed the association between IRV and AIV. The results see Table 2 showed that the public strongly value the recommendation of government and doctors (almost six times) ($p<0.0001$) to go for the influenza vaccination. Similarly, the public believed that the vaccine could protect them from influenza (OR=2.6, $p<0.0001$). Also, public who believed that ill and pregnant should be vaccinated or that the vaccine could stop the spread of influenza were 1.6 times ($p\leq0.05$) more likely to be vaccinated than those with the opposing attitude. However, the respondents who were concerned about the side-effects of vaccine or those who believed that the vaccine was not adequately tested were 2.5 and 2 times more likely ($p<0.01$) to go for vaccination, respectively, as compared to the respondents with no such concern [4].

Dimensions	Stated intention to receive influenza vaccine		
	Yes	No/Will wait	Odds Ratio
	N=223	N=152	(p value)
	n (%)	n (%)	
Believe that ill and pregnant should be vaccinated	77 (34.5%)	36 (23.7%)	1.637 (0.038)
Need government's recommendation	190 (85.2%)	72 (47.4%)	5.938 (0.000)
Need doctor's recommendation	202 (90.6%)	92 (60.5%)	6.258 (0.000)
Believe vaccine can protect from influenza	179 (80.3%)	94 (61.8%)	2.630 (0.000)
Concerned about side-effects	152 (68.2%)	71 (46.7%)	2.498 (0.000)
Believe vaccine is not adequately tested	120 (53.8%)	54 (35.5%)	2.082 (0.001)
Believe vaccine is ineffective for some people	71 (31.8%)	40 (26.3%)	1.278 (0.296)
Believe vaccine can stop the spread of influenza	179 (80.3%)	109 (71.7%)	1.605 (0.05)

Table 2: Attitude towards influenza vaccine and intention to receive its vaccination in future.

DISCUSSION

Statement of principal findings

The responses (n=402) were taken from the three metropolitan cities of Pakistan, namely, Karachi (Sindh) and Lahore (Punjab), and the federal capital, Islamabad. Mostly, the respondents were university graduates with ages between 25-34 years, working, residing with parents and almost 60% of them were never immunized for seasonal influenza.

The public with risks perceptions (notably serious effects on health (OR=5.2, p<0.05 and severe influenza outbreak (OR=7.1, p<0.05)) and attitudes towards influenza infections (influenza out of control (OR=3, p<0.05) and influenza may extend for a long time (OR=3, p<0.05)) were strongly convinced to go for the influenza vaccination. In addition, government and doctors' recommendations (OR=6, p<0.05), can play a significant role in leading public to take influenza vaccination in future. However, public with negative attitudes towards influenza vaccination, regarding its side effects and safety (OR=2.4, 2.0, p<0.05), also agreed to take vaccination for future influenza outbreaks.

Strengths and limitations

The study included a large sample size of around 400 respondents from the federal capital Islamabad and the highly populated metropolitan cities, Karachi and Lahore. This sample represented the majority of the population of Pakistan and can be generalized to other low-middle-income countries having similar mind-sets, large populations and seasons such as Bangladesh, India, Sri Lanka and many other African countries. In addition, similar studies were conducted solely in different cities of Pakistan and for specific populations such as parents, medical students and medical doctors but hardly for the general population. Finally, as Pakistan did not have any influenza immunization policy, results of this study can be helpful in developing national and regional policies against influenza.

Views from the rural population should have been taken as they comprise to 63% of the total population. In addition, people living in the cities have higher awareness than the rural population. Also, there is a possibility of self-selection bias as people who agreed to respond might be more informed about the influenza infection and vaccine than who chose not to participate in the study [5].

Interpreting the findings in the context of wider published literature

Notably, large population countries in Asia such as Bangladesh, China, India, Pakistan, and Sri Lanka, representing almost 45% of the world's population, did not have any public policy against the influenza infection. Generally, seasonal influenza vaccination coverage in most parts of Asia and Africa was less than 1% and only receive 1-4% of the global supply of the seasonal influenza vaccine.

Influenza vaccine uptake rate in Asia among the general population is lowest when compared with healthcare workers and high-risk groups. For instance, India's Healthy People 2020 goals for influenza immunization were to achieve target of 70% but the coverage remained stagnant at 30-40% since the last eight influenza seasons. In Asia, subsidies were usually provided to healthcare workers as they were considered more critical than the general population and this could be one the reasons for low immunization rates among the general public. Many studies conducted in different regions of Asia, for example, China, Hong Kong, and Japan and highlighted that the belief in vaccine's effectiveness, perceived severity, susceptibility towards influenza and minimal cost ('free vaccination') for vaccination, influenced the uptake of influenza vaccination among the general population. In addition, similar to our results, people in China, Hong Kong and India, were motivated to uptake influenza vaccination from the influence of healthcare authorities, media, and community groups. In contrast to these promoters, perceived low vulnerability towards influenza, lack of trust over the vaccine's efficacy and doubts over its safety were

the major reasons for vaccination refusal in the general public in Asia [6].

Majority of the developed countries, however, had immunization national policies against seasonal influenza, For instance, 41 of the 52 upper middle-income and 54 out of 59 high-income member states of the WHO have national influenza immunization policy targeting children, adults with chronic illness, pregnant women, healthcare workers and elderly. WHO regions such as America, Europe and Western Pacific reported circulating 97% of all influenza vaccine.

Despite the availability of safe influenza vaccines, low immunization uptake within the specific risk-groups remain a global challenge and contribute to the disease burden. Specifically, influenza vaccine coverage in the general population all over the world was very low, not achieving even 50% of the desired coverage in target populations. Specifically in Europe and the United States, sociodemographic variables such as age, education gender, income, and additional risk factors were frequently related to the uptake of seasonal influenza vaccine among the general public. Moreover, negative attitude towards vaccine, perceived low vaccine effectiveness, perceived high risk of side effects, decreased perceived severity and decreased worry about influenza were most repeatedly reported barriers to the seasonal influenza vaccine uptake. However, our results showed that people with negative attitudes towards vaccination were also inclined to get the influenza vaccine, possibly because of realizing the threats of viruses and following safety practices for the coronavirus disease as propagated by the government during the COVID 19 pandemic [7].

Implication for practice, policy and research

Several developing countries lacking influenza immunization policies did not have functional National Immunization Technical Advisory Groups 31 (NTIAGs). It is important to strengthen NITAGs for making vaccine recommendations in Pakistan and other countries by reviewing evidence.

Currently there is no national policy for influenza vaccination in Pakistan. Established in 1976, the Expanded Programme on Immunization (EPI) of Pakistan included vaccination for six preventable diseases, namely, diphtheria, measles, pertussis, poliomyelitis, tetanus, and tuberculosis, through free or subsidized immunization. Health experts in Pakistan, keeping in view the high prevalence of influenza, its changing trends (patients taking more time to recover than previously), high cost of vaccine for the unskilled daily wage workers, and low levels of education, demanded to include influenza immunization in EPI. Furthermore, healthcare infrastructure of a country also impacts immunization rates. For example, vaccines require cold storage and cold chain transportation for safe distribution but due to power breakdowns and fluctuating temperatures, Pakistan wasted $3.7 million worth of vaccines donated to protect children from deadly contagious diseases. Hence, Pakistan needs to emphasize on the uptake of influenza vaccine among the general public by including it in the EPI and take measures to maintain and safely transfer influenza vaccine all over the country.

Public awareness of influenza disease and attitudes towards influenza vaccination in Pakistan are indispensable issues that need utmost attention. Sending personal letters to public providing information on influenza signs, symptoms, and prevention, and offering free vaccination was found effective in the uptake of influenza immunization in the European countries and can, therefore, be also effective in Pakistan. Other developing countries such as Egypt, South Africa and Thailand were successful in improving influenza vaccination rates through national vaccination policy against influenza. For example, health education provided through educational videos increased the acceptance attitude towards influenza vaccine among older people in Thailand.

Finally, along with promoting influenza vaccination among the general public, it is therefore, also important that healthcare professionals in Pakistan and other developing countries are also vaccinated against influenza. The percentage of influenza vaccination among the healthcare professionals in Pakistan is quite low, hence, hospitals should make it compulsory for all the staff to get vaccinated because healthcare professionals have a huge responsibility towards the community and should set a good model for the community to get themselves vaccinated [8].

CONCLUSION

Majority of the general public realize the risks associated with influenza virus, and as a precaution, intend to take influenza vaccine in times of influenza seasons and outbreaks, based on the recommendations of government and/or healthcare providers. Government should promote knowledge and understanding of the risks associated with influenza infection by developing public awareness programs and support physicians to recommend influenza vaccination among the general public. Finally, a national policy on influenza vaccination is urgently needed to control and reduce morbidity and mortality of the disease.

ACKNOWLEDGEMENT

We would like to thank all the participants who took part in this study and provided their valuable responses.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

REFERENCES

1. Kee SY, Lee JS, Cheong HJ, Chun BC, Song JY, Choi WS, et al. Influenza vaccine coverage rates and perceptions on vaccination in South Korea. J Infect. 2007;55(3):273-281.

2. Warren-Gash C, Hayward AC, Hemingway H, Denaxas S, Thomas SL, Timmis AD, et al. Influenza infection and risk of acute myocardial infarction in England and Wales: A CALIBER self-controlled case series study. J Infect Dis. 2012;206(11):1652-1659.

3. Song JM, Hossain J, Yoo DG, Lipatov AS, Davis CT, Quan FS, et al. Protective immunity against H5N1 influenza virus by a single dose vaccination with virus-like particles. Virology. 2010;405(1): 165-175.

4. Nair H, Brooks WA, Katz M, Roca A, Berkley JA, Madhi SA, et al. Global burden of respiratory infections due to seasonal influenza in young children: A systematic review and meta-analysis. Lancet. 201;378(9807):1917-1930.

5. Sheldenkar A, Lim F, Yung CF, Lwin MO. Acceptance and uptake of influenza vaccines in Asia: A systematic review. Vaccine. 2019; 37(35): 4896-4905.

6. Bukhsh A, Rehman H, Mallhi TH, Ata H, Rehman IU, Lee LH, et al. Parents' attitude, awareness and behaviour towards influenza vaccination in Pakistan. Hum Vaccines Immunother. 2018;14(4): 952-957.

7. Seale H, Heywood AE,McLaws ML, Ward KF, Lowbridge CP, Van D, et al. Why do I need it? I am not at risk! Public perceptions towards the pandemic (H1N1) 2009 vaccine. BMC Infect Dis. 2010;10(1):1-9.

8. Hasan F, Khan MO, Ali M. Swine flu: knowledge, attitude, and practices survey of medical and dental students of Karachi. Cureus. 2018;10(1).