

Knowledge, attitude and practices towards seasonal influenza vaccination among healthcare workers

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ABSTRACT

Background: Vaccination as a primary prevention strategy is a well-established public health policy for preventing influenza. Despite strong recommendation, vaccination coverage among health workers is still not satisfying. The intention of the current study is to evaluate the knowledge, attitudes and practices towards influenza vaccination among healthcare workers. **Materials and Methods:** In this cross-sectional, single-centre study, 789 healthcare workers (out of total 1380) participated. Institutional ethical committee clearance was obtained before the study. It was conducted in October 2021. A structured questionnaire in the form of Google sheet was sent to all healthcare professionals (HCPs) affiliated with the institution. Data collected was tabulated using MS Excel and analysed using appropriate statistical tools. **Results:** Of the 1380 approached, a total of 789 (57.17%) HCPs responded to the questionnaire. The overall vaccination coverage in the study population was 71.6%. The overall vaccination acceptance rate drops to 36.78% when those taken vaccine as a recommended pre-employment requisite and got never vaccinated again were excluded. Also, 88.21% of the respondents believed that influenza is a potentially dangerous disease and 93.16% believed that flu vaccination is effective against preventing influenza. Although 736 participants (93.28%) were aware that seasonal influenza vaccine is recommended for healthcare workers, irrespective of age and comorbidities, only 411 (52.1%) intended to take vaccine in the coming year. Also, 97.34% of the participants considered vaccine as safe. **Conclusion:** Influenza vaccination coverage among healthcare workers is still at an unsatisfactory level. This is despite majority of the HCPs accepting that the vaccine is safe and preventive against influenza. Efforts are still needed to improve the coverage.

KEY WORDS: Healthcare Workers, influenza, vaccine

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INTRODUCTION

Influenza tops the list of major public health issues in the world. Influenza viral infection is an important cause of morbidity and mortality, with annual infections leading to an estimated 291,243–645,832 seasonal influenza-associated respiratory deaths (4.0–8.8 per 100,000 individuals) annually, with the highest estimated

mortality rates in sub-Saharan Africa (2.8–16.5 per 100,000 individuals), southeast Asia (3.5–9.2 per 100,000 individuals) and among people aged 75 years or older (51.3–99.4 per 100,000 individuals).^[1] Although most of the infected people recover without sequelae, it has the potential to cause serious illness and death, particularly among the extremes of age, pregnant women and those

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with certain chronic medical conditions. Healthcare professionals (HCPs) are at a high risk for contracting the disease due to close contact with cases. Transmission of influenza virus from patients to HCWs, from HCWs to patients and among HCWs has been well documented.^[2] Since nosocomial infection of influenza among hospital staff and patients is common, the Advisory Committee on Immunization Practices (ACIP) and the Centers for Disease Control and prevention (CDC) recommend annual influenza vaccine for all HCPs.^[3]

Annual influenza vaccination is an effective strategy to prevent the development of the infection and its potentially severe complications. International as well as Indian consensus-based recommendations on influenza vaccination in adult groups consider healthcare workers working in hospitals/institutional settings (doctors/nurses/paramedics) to be at a high risk for contracting influenza, and hence recommend annual vaccination for them.^[3] Previous studies have highlighted the fact that annual influenza vaccination reduces the mortality and morbidity of HCPs as well as patients.^[4,5] It reduces employee illness and absenteeism.^[6] But ensuring regular adherence to seasonal influenza vaccination appears challenging.^[7,8] Many factors contribute to the same, which include, but are not limited to, poor risk perception, inadequate knowledge, concerns and misperceptions about vaccine safety and efficacy, misinformation/unfounded rumours, hesitancy and a disconnect between the perceptions and practice.^[9,10] HCPs play an important role in immunisation of public through their proper awareness, positive attitude and ample information.^[11] Furthermore, vaccinated HCPs also play a crucial role in disseminating knowledge to the public regarding immunisation. Patients often rely on their healthcare provider for trustworthy information related to vaccines and vaccine-preventable diseases.^[12] Also, poor sensitisation of the care providers has been recognised as the most important impediment to influenza vaccine rollout in high-risk groups.^[13]

The influenza vaccination coverage among HCPs is still low, despite several recommendations.^[14] Data about the vaccination uptake in low- and middle-income countries are scanty.^[15] It is, therefore, important to conduct regular appraisal of HCPs' attitudes towards acceptance of and participation in immunisation, as these have been established as accurate predictors of acceptance and vaccination rate among patients and/or the general population.^[12] Therefore, this study was planned to explore the knowledge, attitude and practices (KAP) related to influenza vaccination in HCPs in a tertiary care centre in South India with the ultimate goal to gather information to plan necessary interventions and policies aimed at improving influenza vaccination coverage among HCPs.

MATERIALS AND METHODS

In this cross-sectional, single-centre study, HCPs affiliated to a tertiary care centre in South India were included.

Institutional ethical committee clearance was obtained before the study. It was conducted in October 2021. A structured questionnaire in the form of Google sheet was sent to all HCPs affiliated with the institution. The questionnaire was adapted from various previous studies and was initially piloted and validated among a small group of 32 participants before rolling out to the entire staff. A brief introduction to the purpose of the study was given in the initial page of the Google sheet. The willingness to complete the form was considered as consent to participate in the survey. The questionnaire was structured in a way to collect the HCPs' KAP towards seasonal influenza vaccination. It addressed demographic information, type of profession and location of work and importance of the influenza vaccine; person's vaccination status within the last year or the last 5 years; and reasons that prevented the Health care worker (HCW) s from getting vaccinated. Data collected was tabulated using MS Excel and analysed using Statistical Package for the Social Sciences (SPSS) version 16.0. Results on continuous measurements are represented using mean \pm standard deviation (SD) and results on categorical measurements using frequencies and percentages.

RESULTS

Of the 1380 approached, a total of 789 (57.17%) HCPs responded to the questionnaire. Of these, 541 (68.57%) of the respondents were females and 248 (31.43%) were males. The highest number of respondents belonged to the age group between 25 and 39 years (496; 62.87%), followed by those between 18 and 25 years (152; 19.26%). Majority of the respondents were nurses who comprised nearly half (48.54%) of the total study population. The demographic characteristics of the study population are shown in Table 1.

The overall vaccination coverage in the study population was 71.6%. Out of the 789 participants, 565 had their flu vaccination at least once in their lifetime. Also, 64.07% of doctors, 78.07% of nursing professionals and 67.43%

Table 1: Characteristics of the respondents

Characteristics	Number	Percentage
Gender		
Male	248	31.43
Female	541	68.57
Age (years)		
18-25	152	19.26
25-39	496	62.87
40-49	86	10.9
50-59	24	3.04
>60	31	3.93
Job level		
Consultant doctors	102	12.93
Registrar/senior registrar	45	5.70
Residents/medical officers	84	10.65
Registered nurse	383	48.54
Administrative/support staff	67	8.49
Paramedical staff	108	13.69

of the paramedical staff were vaccinated at least once. Of the 565 vaccinated participants, 381 had their vaccination done as part of the pre-employment formalities. Out of the 381 participants, 275 failed to get vaccinated annually after the initial dose. Thus, 63.22% of the total respondents never had an influenza vaccination taken voluntarily. The overall vaccination acceptance rate drops to 36.78% when those who had taken vaccine as a recommended pre-employment requisite and got never vaccinated again were excluded. This vaccination rate is notwithstanding the fact that 88.21% of the respondents believed that influenza is a potentially dangerous disease and 93.16% believed that flu vaccination is effective in preventing influenza. Table 2 shows the reasons for acceptance and refusal of influenza vaccine.

Among the 275 who did not take the vaccine any time after the institution recommended pre-employment flu shot, 100 respondents believed that skipping flu shots a few years in between would not cause any issue. Other reasons quoted were lack of a reminder system leading to forgetting annual vaccination, vaccine unavailability and previous vaccination causing febrile illness.

Analysis of questions related to knowledge about influenza revealed that 88.21% respondents considered influenza as a potentially severe disease. Most of the participants were aware about adult seasonal influenza vaccination (95.18%), and a few (6.84%) thought that influenza vaccine was not effective in preventing flu. Although 736 participants (93.28%) were aware that seasonal influenza vaccine is recommended for healthcare workers, irrespective of age and comorbidities, only 411 (52.1%) intended to take vaccine in the coming year. Twenty-nine participants were not aware that influenza vaccine was available at their hospital. Also, 83% (655) of the participants had proper knowledge that the vaccine should be administered annually. Of the 789 total respondents, 48 (6.08%) considered flu vaccine should be taken every 6 months and 45 (5.7%) and 41 (5.2%) believed that the vaccine should be taken only once in 5 years and once in a lifetime, respectively. The responses to knowledge questions are shown in Table 3.

Most of the respondents ($n = 768$; 97.34%) considered the vaccine to be safe. Among the 21 who considered influenza vaccine unsafe, seven were doctors, nine were nurses and others (eight) were paramedics. The reasons put forth by 15 of the 21 respondents who considered influenza vaccine unsafe were chances of infection after a vaccination. Other reasons mentioned included internet sites suggesting that vaccine causes adverse effects, reluctance after knowing someone who had adverse reaction following vaccination and perception that vaccines weaken immune system and nervous system.

With regard to attitude towards vaccination, most respondents agreed that being HCPs, there was a high risk for influenza transmission. There was increasing agreement that

Table 2: Reasons associated with acceptance and refusal of influenza vaccine

	Total	Percentage
Reason for acceptance ($n=565$)		
Recommended at the workplace	274	48.50
Protecting high-risk patients	115	20.35
Family protection	68	12.04
Self-protection	41	7.26
Both family and self-protection	42	7.43
All the above	10	1.77
Other reasons	15	2.65
Reason for not taking vaccine ($n=224$)		
Vaccine will not prevent influenza	20	8.93
Influenza will not cause much harm to me	32	14.28
Fear of side effects/vaccine reaction	28	28
I am not at risk of influenza	22	12.5
Inability to find time in workplace	59	26.34
Costly	46	20.53
Other reasons*	42	18.75

COVID=coronavirus disease. *Other reasons are no clarity on the type available, unaware of availability, unaware about this vaccination, being pregnant and fear of interaction with COVID vaccine

Table 3: Responses to knowledge questions in the questionnaire on influenza vaccine

Question	Yes	No
Is influenza considered a potentially severe disease?	696 (88.21%)	93 (11.79%)
Are you aware about adult vaccination like seasonal influenza vaccine?	751 (95.18%)	38 (4.82%)
Do you think Influenza vaccine is effective in preventing flu?	735 (93.16%)	54 (6.84%)
Are you aware that seasonal influenza vaccination is recommended for healthcare workers?	736 (93.28%)	53 (6.72%)
Do you know that vaccine is available in your hospital?	760 (96.32%)	29 (3.68%)

vaccine is protective. Also, most respondents disagreed to the fact that vaccines weaken the immune system. However, majority (38%) had neutral response to the statement that the adverse effects of vaccines are underreported, whereas a significant number of respondents (30%) believed that they indeed are. The responses to questions related to attitude are shown in Table 4.

Ninety percentage of the total 789 respondents were of the opinion that annual influenza vaccination should be mandatory or that it should be a condition for employment of healthcare workers working in high-risk areas. Most participants (79.4%) identified healthcare workers as the high-risk group, for whom influenza vaccination is strongly recommended. Other individuals reported as high-risk categories by the respondents included persons more than 65 years of age with or without comorbid illnesses ($n = 365$; 46.2%), persons aged 2–64 years with comorbid illnesses ($n = 312$; 39.5%), residents of long-term care facilities ($n = 227$; 28.7%), pregnant women ($n = 203$; 25.7%) and children aged 6–23 months ($n = 174$; 22%).

The respondents in the survey expressed the need to provide SMS reminders when the vaccine is due and to

Table 4: Attitude towards influenza vaccination

Perception	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Median
Being a healthcare professional, I have high chances for influenza infection	242 (30.7%)	386 (48.9%)	108 (13.7%)	20 (2.5%)	33 (4.2%)	2
Influenza is not a contagious disease	59 (7.5%)	186 (23.6%)	85 (10.8%)	232 (29.4%)	227 (2.87%)	4
Influenza is not a dangerous disease	18 (2.3%)	154 (19.6%)	99 (12.5%)	357 (45.2%)	161 (20.4%)	4
I can get influenza despite being vaccinated, so vaccine is not protective	10 (1.3%)	99 (12.6%)	195 (24.7%)	356 (45.1%)	129 (16.3%)	4
Vaccine weakens the immune system	9 (1.1%)	31 (3.9%)	77 (9.8%)	387 (49.1%)	285 (36.1%)	4
Adverse vaccine effects are underreported	21 (2.7%)	218 (27.6%)	304 (38.5%)	194 (24.6%)	52 (6.6%)	3

Responses are classified as 1 – strongly agree, 2 – agree, 3 – neutral, 4 – disagree, 5 – strongly disagree

display information regarding vaccine availability in notice boards. Many suggested to conduct awareness sessions before making it a mandatory employment condition. Similarly, there were requests for providing flu vaccination at reduced cost or free of cost for HCPs.

DISCUSSION

Compared to the previous data generated about a decade earlier, our data reflect a significant improvement of influenza vaccination uptake among HCPs in India. In the first of its kind cross-sectional study among HCPs of three major hospitals in Srinagar, India, by Bali *et al.* in 2013, it was found that only 4.4% of the 1421 participants had ever received influenza vaccination, despite 81% being aware of a vaccine against influenza and 58% being aware of its local availability. However, in the present similar study conducted 9 years later in a South Indian state, the vaccination coverage has improved from 4.4% to 71.6%. But excluding those who had taken vaccine as a recommended condition for employment and were never vaccinated later, the coverage drops to 36.78%, which is still better than the situation in 2012. The situation is still not satisfactory in similar low- and middle-income countries like Pakistan, where a recent study showed only 8.84% as the vaccine uptake among doctors.^[16]

In the Srinagar study, 94% of the respondents considered vaccine to be safe, but still the coverage was very low with reasons being ignorance about vaccine availability, inability to find time for vaccination, obliviousness to being at risk of influenza, lack of time due to busy clinical schedule, fear of side effects and so on.^[14] More than 97% of the respondents in the current study considered the vaccine to be safe; however, many of the participants were not vaccinated, with the major reasons being cost concerns, lack of time in the workplace and fear of side effects. The reasons for refusal of vaccine in a similar study by Tuohetamu *et al.*^[17] were poor knowledge about the vaccine (46%), perception that there is no need for it because of having good health (45%) and worry about adverse reactions (33%). Worry on adverse effects and high cost of vaccine were the common reasons mentioned in many studies like the current one.^[16-18]

Lack of awareness (82.73%) was considered the prime reason behind low vaccination in a Sierra Leone study by James *et al.*^[18] This is contrary to the results of the current

study in which more than 95% of the respondents were aware of the vaccination. In the same study, more than half of the healthcare workers believed that they were less susceptible to influenza infections than other people.^[18] Surprisingly, in the study from Pakistan, 72.6% doctors were unaware of influenza immunisation recommendation by the ACIP and CDC.^[16]

The reasons behind acceptance of vaccine are also a subject to be analysed. The most common reasons for getting vaccinated were self-protection, protection of family members and increasing risk of influenza among healthcare workers.^[19,20] These are in agreement with our study findings, though most respondents in the current study chose 'recommended at the workplace' as the prime motivation. Such mandatory influenza vaccination as a practice was found to be an effective policy in improving the vaccination rate of healthcare personnel, as described in previous studies.^[21]

In our study, 93.28% were aware that seasonal influenza vaccine is recommended for healthcare workers, irrespective of age and comorbidities, but only 52.1% were planning to take vaccine in the coming year. A study from our hospital done in 2018 showed high prevalence of H1N1 among community-acquired viral pneumonia (41.9%) and influenza B, accounting for 9%. Poor vaccination status despite adequate knowledge that influenza is a potentially dangerous disease reflects a dissociation between knowledge and practice. This indeed calls for mass campaigns and awareness programmes to fill the lacunae. With world being standstill due to newly emergent viruses, it is high time to formulate Universal Immunisation Programme for adults, including influenza vaccination in it.

Efforts are still inadequate for creating awareness on flu vaccination among HCPs. While influenza vaccination is mandatory in many of the developed countries, it is not endorsed as a national policy in countries like India, although national guidelines emphasise the importance of taking influenza vaccination annually. The vaccination strategy is far from limelight in developing countries as it is limited as being the responsibility of individual doctors, especially pulmonologists, and certain hospitals. Even though efforts for childhood vaccination in India are applaudable, adult vaccination remains dormant in the healthcare system, especially in public hospitals.

The US model should be considered as an example in this regard. In 2010, 60% of flu vaccine coverage among healthcare workers was taken as one of the US national health objectives. Making vaccine available free of cost or at subsidised rates for healthcare workers, increasing availability at multiple sites and incentive strategies are a few steps to be considered for implementation to augment vaccination to a satisfactory level.^[22] An interesting incentive scheme implemented in Greece during 2016–2017 influenza season was to give 1 day off work for vaccinated HCPs.^[23] Such novel schemes and studies in similar lines, when put into effect, can potentially improve the vaccination uptake in HCPs. A vaccinated professional himself is a role model for the patients to practice the same.

The study is not devoid of limitations. Being a single-centre study, it might not be representative of a population. Moreover, the vaccination status was self-reported by the respondents and was not verified with medical records. Chances of bias in the form of socially desirable responding and recall cannot be rule out in this scenario. A KAP done among healthcare workers may not reflect the real scenario in the community, and we accept this as a limitation of our study. Also, the risk perception of influenza vis-à-vis other occupational disease by the HCPs has not been included in this questionnaire. A larger sample size with a better designed questionnaire would have compensated for the limitations.

CONCLUSION

The study highlights the fact that acceptance of influenza vaccination of healthcare workers in South India is still low, though improved compared to previous studies. This is despite the fact that the study has been done in the state of Kerala, which has a literacy rate of 100%. The dissociative factor of HCPs not practising vaccination despite the knowledge that influenza is a potentially dangerous disease is of concern, although the vaccine is easily available. This highlights the need for sustained measures to enhance the vaccination rates by intensive educational activities and other adaptable measures.

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Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient (s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published, and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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