

Original Research Article

AWARENESS & UPTAKE OF INFLUENZA AND PNEUMOCOCCAL VACCINES AMONG ELDERLY PATIENTS ATTENDING A TERTIARY CARE HOSPITAL- A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Influenza and Pneumococcal diseases have contributed a considerable burden to the health of world's population. These burdens tend to be more severe in older age groups and people with chronic medical conditions such as Systemic hypertension and Diabetes Mellitus. Although vaccines are available for Influenza and Pneumococcal diseases and are effective in prevention of such diseases, the immunization rate is found to be very less than the desired amount. The knowledge, attitude, and health practices of people play an important role in the immunization of the population and understanding how these factors influence a population towards vaccination maybe vital for further vaccination programs. **Objective:** The purpose of this study is to find the prevalence of influenza and pneumococcal vaccination rate in an elderly population and to find out other potential factors that may influence the vaccination rate.

Materials and Methods: A cross-sectional interviewer-administered questionnaire study was conducted among 207 elderly participants attending a tertiary care hospital.

Results: Awareness was observed in 13 (6.3%) participants. Influenza vaccine uptake was 2.9%, and pneumococcal vaccine uptake was 1.4%. Healthcare-related occupational exposure was significantly associated with vaccine uptake.

Conclusion: Awareness of influenza and pneumococcal vaccines among elderly participants was low, and vaccine uptake was extremely poor. Healthcare-related occupational exposure and health promotion activities were associated with higher vaccine uptake. The knowledge and awareness about pneumococcal disease is lower compared to the knowledge about influenza in the study group. No statistically significant association was observed between attitude measures and vaccination status in this study population.

Keywords: Influenza vaccine, Pneumococcal vaccine, Knowledge, Attitude, Vaccine hesitancy, public health.

INTRODUCTION

Immunization/Vaccination is the process of administering vaccines which contains immunogens causing an immune response in an individual; and it remains as one of the effective measures in preventing a disease. The immunity developed from such helps in preventing disease in the individual;

and if done to adequate people in a community can reduce the overall disease burden of the community. Even though an effective immunization program for children is present, there's no such program for the elderly population. Elderly people are also prone to develop more complications, and the case fatality rate is also higher due to associated factors such as long-term comorbidities and poor immunity. Influenza is

an acute respiratory infection which affects both the upper and lower respiratory tract and is caused by the highly contagious virus Influenza type A, B and C. Even though the disease affects people of all age groups, the severity is more in the children and elderly. In Influenza A infections, there is apoptosis of leukocytes recruited into the airways resulting in reduced efficiency of bacterial phagocytosis and destruction. Many other immune functions can also be compromised during Influenza infection which increases the risk and severity of secondary infection. Although influenza is widely considered as a public health focus, *Streptococcus pneumoniae* remains as the most common cause of Community-acquired pneumonia, it leads to complications such as meningitis, and sepsis. Pneumococcal vaccines such as Pneumococcal Conjugate Vaccine (PCV-13) and Pneumococcal Polysaccharide Vaccine (PPSV-23) a 13 and 23 different strains of *Streptococcus Pneumoniae* respectively are currently available in the market. These vaccines not only reduce the risk of acquiring infections but also reduces the disease severity and shortens the duration of hospital stay and decreases the mortality rate of Pneumonia. Post-influenza Pneumonia and other secondary infections which arise after the patient recovers, are due to organisms such as *Streptococcus Pneumonia*, *Staphylococcus aureus* and *Haemophilus Influenzae*. Secondary bacterial infections are much more easily recognized clinically when compared to viral/bacterial pneumonia since these secondary infections tend to occur during the recovery phase which makes the diagnosis easier on follow-up. The severity of the post-influenza pneumonia is also affected by the virus-induced changes of the host during the initial influenza infection. These two diseases have many similarities including the mode of transmission, severity in the elderly and the presence of secondary and superinfection of the pneumonia associated with influenza.

Hence, raising awareness of influenza and pneumococcal vaccines together is much needed in addressing the problem.

The attitude of people towards vaccination and health practices also influences the disease burden in the community. Attitude refers to an individual's beliefs, perceptions and feelings towards a disease and its preventive measures. If a community as whole perceives influenza as simple as a seasonal fever, the incidence rate and disease morbidity are bound to be more compared to a community which had wariness and followed preventive measures to reduce the incidence. Negative attitudes towards vaccination including the fear of side effects, questioning the efficacy of vaccines and mistrust in health care systems also reduces vaccine uptake and adherence to preventive measures. Such attitudes are less in people who have a work history in health care systems, and knowledge about diseases and vaccines are also higher. People who work in health care have more positive attitude towards vaccination and promote health seeking behaviour as a community.

Health practices are observable behaviours that directly affects the exposure, prevention and management of diseases. Simple measures such as using masks not only due to infections but also during high prevalence in the community, following proper hand sanitization methods, covering nose and mouth during sneezing and coughing are also effective in reducing the transmission of most respiratory infections. Currently delayed consultation, self-medications using home remedies and over the counter (OTC) drugs, or inappropriate antibiotic usage are the major factors contributing to poor outcomes. Attitudes and practices are also shaped by broader determinants such as education level, financial status and access to healthcare. Mass media, social media and community level knowledge also influences and perceptions. Increasing community level awareness, addressing the behavioural barriers and promotion of evidence based positive health practices are essential in effective control of pneumonia and influenza diseases.

MATERIALS AND METHODS

The study was conducted in Omandurar Medical College and Hospital which is a tertiary care hospital in Chennai, India. Data was collected between December 2025 and February 2026 from the health beneficiaries attending the hospital. The aim of the study is to find the prevalence of vaccinated individuals and the knowledge and awareness of influenza and pneumococcal diseases among the people visiting the hospital.

Ethical approval for the study was obtained from the Institutional Ethics Committee of Government Omandurar Medical College. Written informed consent was obtained from all participants prior to enrolment.

The study was conducted in a structured, interviewer administered questionnaire format. Study size was calculated with a 95% confidence interval and estimated prevalence of 8% according to the previous studies with the error of margin of about 2%. The sample size was calculated to 189 and an extra 10% is added to account for invalid data and unwillingness to participate in the study.

To be part of the study, the people had to be 60 years of age or more, visiting the outpatient departments during the time the study was being carried out, and in good health with the ability to understand the study and participate in it. People less than 60, in poor health during the time of the study, and with poor cognitive functioning were not part of the study. Convenience sampling was used.

The questionnaire consisted of the following sections:

Informed consent form

Demographic details.

Previous knowledge about influenza and pneumococcal disease and vaccines.

Factors that would encourage vaccine uptake.

The data was entered into Microsoft Excel and analyzed using IBM SPSS Statistics software. Descriptive statistics were used to summarize demographic characteristics, awareness levels, and vaccine uptake. Categorical variables were expressed as frequencies and percentages. Associations between categorical variables and vaccine uptake were assessed using the Fisher's Exact test as expected count of vaccination is less than 5. A p-value of less than 0.05 was considered statistically significant.

RESULTS

A total of 207 elderly individuals aged ≥ 60 years were included in the final analysis. The mean age of the participants was 67.6 ± 3.9 years (range: 60–79 years). Most participants belonged to the 60–69 year age group (63.1%), followed by the 70–79 year age group (35.9%). Males constituted 55.6% of the study population, while females accounted for 44.4%. The majority of participants were married (64.7%), had school-level education (66.2%), and were

unemployed or retired (66.7%). Only 6.3% reported a healthcare-related occupational background. Chronic medical conditions were present in 66.7% of participants. More than half of the participants did not possess medical insurance (57.5%). Most participants were non-smokers (68.6%) and resided in urban areas (80.7%).

The overall awareness of adult influenza and pneumococcal vaccination was observed in 13 participants (6.28%). The remaining 194 participants (93.72%) reported no prior awareness of adult vaccination recommendations.

Among the 13 only 6 participants had reported taking influenza vaccine (2.9%), while 201 participants (97.1%) had not taken the vaccine.

Pneumococcal vaccination was documented in only 3 participants (1.45), while the remaining 204 participants (98.55%) had not taken the vaccine.

These alarmingly low levels of vaccinated individuals indicate a significant gap in current preventive healthcare system among the high-risk elderly outpatient population.

Table 1: Association between Study Variables and Vaccine Uptake

Association	Fisher's Exact p-value
Healthcare occupation vs Influenza vaccine	<0.001
Healthcare occupation vs Pneumococcal vaccine	<0.001
Influenza knowledge vs Influenza vaccine	0.437
Pneumococcal knowledge vs Pneumococcal vaccine	0.109
Pneumococcal attitude vs Pneumococcal vaccine	0.879
Health promotion exposure vs Pneumococcal vaccine	0.008

Healthcare occupation demonstrated a highly significant association with both influenza vaccination ($p < 0.001$) and pneumococcal vaccination ($p < 0.001$), indicating strong clustering of vaccine uptake within healthcare-connected individuals. Participants with a healthcare-related occupational background were more likely to report vaccine uptake compared with those without such exposure.

Health promotion exposure showed statistical significance for pneumococcal vaccination ($p = 0.008$), suggesting targeted health communication may positively influence uptake.

However, influenza knowledge ($p = 0.437$), pneumococcal knowledge ($p = 0.109$), and pneumococcal attitude ($p = 0.879$) were not significantly associated with vaccination status, indicating that knowledge alone did not translate into vaccine behaviour.

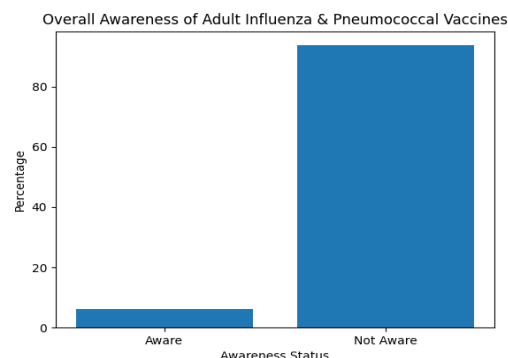


Figure 1: Awareness Distribution

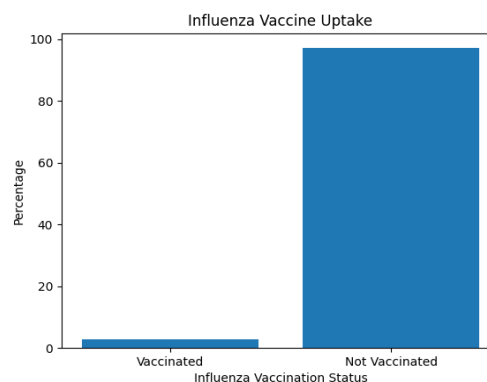


Figure 2: Influenza Vaccine Uptake

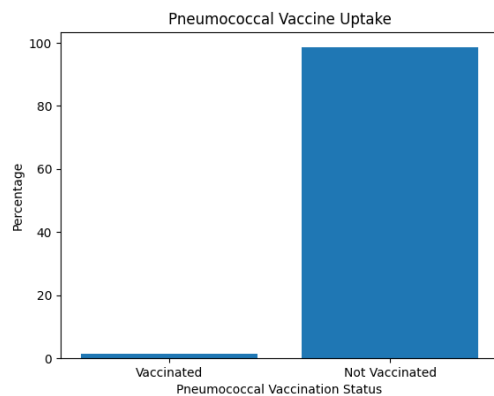


Figure 3: Pneumococcal Vaccine Uptake

DISCUSSION

This study revealed that the level of vaccine awareness is low and there is an alarmingly low levels of vaccinated individuals among the elderly community attending the hospital.

The low level of vaccine awareness, i.e., 6.3%, may suggest insufficient community-level awareness and health promotion regarding adult vaccination.

The low levels of vaccine use, i.e., 2.9% for the flu vaccine and 1.4% for the pneumococcal vaccine, are critically low.

The reasons for non-vaccination among the elderly population were numerous and diverse, shedding light upon the complexity of the barriers to vaccination.

One of the major reasons for the low levels of vaccination among the elderly population was due to the lack of awareness, as many were not aware of such vaccines and that the vaccines were also recommended for the elderly. Many among the participants believed that vaccines were meant for children.

Another important factor for the low levels of vaccine use in the elderly population was the absence of recommendation by the physician, as many of the elderly population had never been advised to take the vaccines.

Since they were in constant touch with the health care system for the management of chronic diseases, the absence of recommendation is an important deficiency.

Another important factor for the low levels of vaccine use in the elderly population was the low susceptibility to the disease, as many were of the opinion that they were not susceptible to the diseases caused by the flu and pneumococcal vaccines, even though they were suffering from co-morbid conditions.

Fear of the consequences of adverse effects, such as fever, weakness, or worsening of the condition, also played a role in the hesitancy of the participants.

Financial issues were also identified as a factor in the hesitancy of the participants, as vaccines for adults cannot be procured without incurring costs in many

situations. The elderly with low economic status reported that financial issues played an important role in the decision-making process of the participants.

Logistical issues, such as the elderly having difficulty in movement or depending on the support of their family members, also played a role in the hesitancy of the participants.

A minority of the participants reported general vaccine hesitancy, which included the effectiveness of the vaccines or the consequences of the vaccines based on misinformation.

It can be concluded from the findings of the present study that the awareness–uptake gap is maintained by the interplay of informational issues, behavioural hesitancy, and health system issues, which need to be addressed by physician counselling of the elderly.

The significant association observed between healthcare-related occupational exposure and vaccine uptake suggests that familiarity with healthcare systems and greater exposure to health information may influence vaccination behaviour among elderly individuals. However, due to the cross-sectional nature of the study, causal relationships cannot be established.

The lack of significance between knowledge variables and vaccine uptake indicates that the elderly may not act based on the knowledge they possess or the information they have been exposed to, and other triggers may be necessary for the elderly to act upon the knowledge they possess regarding vaccines.

The significance of health promotion exposure in the process of vaccine uptake for pneumococcal vaccines indicates that health communication may have an impact on the elderly in the process of vaccine uptake. The extremely low baseline of the participants indicates that the health communication process has to be more intense and institutionalized in the country.

In relation to the health programmes, the findings of the study promotes the integration of vaccination protocols into the geriatric patient age groups. Vaccine counselling, cost-subsidy models could improve vaccine uptake since these are the common reasons the study derived as the cause of people not getting vaccinated.

This study has certain limitations. The study was conducted in a single tertiary care hospital, which may limit the generalizability of the findings to the wider elderly population. Vaccination status was based primarily on participant self-report and may therefore be subject to recall bias. In addition, the extremely low number of vaccinated participants limited the statistical power available to detect associations between vaccine uptake and other study variables.

CONCLUSION

In summary, this study identifies a profound awareness–uptake gap in adult vaccination among elderly individuals. Healthcare system–driven

interventions, rather than passive knowledge dissemination alone, appear essential to improve immunization coverage in this vulnerable population.

REFERENCES

1. Iuliano AD, Roguski KM, Chang HH, et al. Estimates of global seasonal influenza-associated respiratory mortality: a modelling study. *Lancet*. 2018;391(10127):1285-1300.
2. Troeger C, Blacker B, Khalil IA, et al. Estimates of the global, regional, and national morbidity, mortality, and etiologies of lower respiratory infections in 195 countries, 1990–2016: a systematic analysis. *Lancet Infect Dis*. 2018;18(11):1191-1210.
3. Moberley S, Holden J, Tatham DP, Andrews RM. Vaccines for preventing pneumococcal infection in adults. *Cochrane Database Syst Rev*. 2013;(1):CD000422.
4. Osterholm MT, Kelley NS, Sommer A, Belongia EA. Efficacy and effectiveness of influenza vaccines: a systematic review and meta-analysis. *Lancet Infect Dis*. 2012;12(1):36-44.
5. MacDonald NE. Vaccine hesitancy: Definition, scope and determinants. *Vaccine*. 2015;33(34):4161-4164.
6. Lorini C, Santomauro F, Donzellini M, et al. Health literacy and vaccination: A systematic review. *Hum Vaccin Immunother*. 2018;14(2):478-488.
7. Böhmer MM, Walter D, Falkenhorst G, et al. Barriers to pandemic influenza vaccination and uptake of seasonal influenza vaccine in the post-pandemic season in Germany. *BMC Public Health*. 2012;12:938.
8. Schmid P, Rauber D, Betsch C, Lidolt G, Denker ML. Barriers of influenza vaccination intention and behaviour – A systematic review of influenza vaccine hesitancy. *PLoS One*. 2017;12(1):e0170550.
9. Vila-Córcoles A, Ochoa-Gondar O, Hospital I, et al. Influence of chronic illnesses and underlying conditions on influenza vaccination coverage. *Vaccine*. 2007;25(49):8362-8368.
10. Lu PJ, O'Halloran A, Williams WW, Lindley MC, Farrall S, Bridges CB. Racial and ethnic disparities in vaccination coverage among adult populations in the United States. *Am J Prev Med*. 2015;49(6 Suppl 4):S412-S425.