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ORIGINAL PAPER

Evaluation of the knowledge, attitudes and behavior of healthcare workers concerning influenza vaccination in a training and research hospital in Türkiye

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ABSTRACT

Introduction and aim. Although increasing vaccination rates among healthcare workers (HCWs) is crucial for protecting their own health and preventing the spread of infections to patients, vaccination rates remain low. The purpose of this study is to evaluate the knowledge, attitudes, and behavior of healthcare workers concerning seasonal influenza vaccination in a training and research hospital in Türkiye.

Material and methods. This cross-sectional descriptive study was conducted among 364 healthcare workers working in a training and research hospital in Ankara, Türkiye. A face-to-face questionnaire was completed by selected participants that included questions about their sociodemographic characteristics, receiving seasonal influenza vaccination, reasons for not receiving vaccination, attitudes and behavior towards seasonal influenza vaccination recommendations for their surroundings, knowledge of who should get the vaccine, and their immunization history.

Results. Among the participants, 58.5% stated that they had never received an influenza vaccination, 35.7% mentioned not receiving the regular influenza vaccination, and only 5.8% reported receiving the influenza vaccination regularly every year. Reasons for not getting vaccinated included not trusting the influenza vaccine's protection (60.1%), not believing they are in the risk group (38.9%), and not finding a suitable time to get vaccinated (36.1%). A total of 57.1% of the healthcare workers recommended the influenza vaccine for their surroundings.

Conclusion. Influenza vaccination rates among healthcare workers are quite low. To maximize influenza vaccine uptake, awareness programs are needed to correct the misconceptions health care workers have about the vaccine, and diverse strategies should be implemented to encourage them to get vaccinated, thereby promoting influenza vaccination.

Keywords. attitude, behavior, healthcare workers, influenza vaccine, knowledge

Introduction

Influenza is a major health concern that can lead to serious complications in individuals with risk factors.[1] Yearly, influenza epidemics have the potential to impact 5% to 15% of the global population, resulting in approximately 4-5 million severe cases and causing 250,000 to 500,000 fatalities.[2] Influenza is a markedly contagious acute respiratory infection disease distinguished by symptoms such as fever, cough, headache, muscle and joint discomfort, pronounced malaise, sore throat, and nasal congestion.[3] The course of influenza can be mild or severe, depending on various factors and conditions (i.e., age, immune status, comorbidity, and seasonal flu strain).[1] Children under 5 years of age, chronically ill

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and immunocompromised patients, the elderly (>65 years), and pregnant women are at high risk of complicated influenza courses.[1-4]

Annual vaccination is the primary measure to prevent influenza and its complications.[5] For this reason, the World Health Organization (WHO) recommends annual vaccination for pregnant women at any stage of pregnancy, children aged between 6 months to 5 years old, elderly individuals (aged more than 65 years), individuals with chronic medical conditions, and healthcare workers (HCWs).[6]

Healthcare workers who are typically healthy adults, are not at high risk of experiencing severe complications after contracting an influenza infection. However, they constitute a recommended target group for vaccination against seasonal influenza, as per the guidelines outlined by the WHO.[7] Healthcare workers are at high risk of both contracting influenza and spreading the virus to vulnerable patients. This situation increases the global burden of the disease and particularly affects healthcare services.[8,9] Nevertheless, despite efforts to improve influenza vaccination coverage among HCWs for many years, vaccination is still low in this group in many European countries.[4,10]

Similar to other vaccines, it is widely recognized that the attitudes of individuals toward receiving the influenza vaccination play a significant role in determining the effectiveness of vaccination. The specific advantages of vaccination for HCWs have not been thoroughly documented; however, existing studies indicate a minor reduction in sickness absenteeism (around 0.5 days) and a diminished likelihood of contracting the influenza virus.[10-12]

Aim

The aim of this study is to evaluate the vaccination rates, the knowledge and behaviors of HCWs related to seasonal influenza vaccination.

Material and methods

This cross-sectional and descriptive study was conducted among HCWs employed at a training and research hospital in Ankara, Türkiye. Currently, our tertiary hospital has a total of 1437 HCWs in service. The sample size for the study was determined to be 369 individuals out of 1437 HCWs, with a 95% confidence interval, an error margin of 0.05, and 50% unknown frequency, according to the simple random sample calculations with 6 epi-info sample package programs. Three hundred and sixty-four out of the 369 individuals comprised the sample.

The pre-prepared questionnaire was administered to the participants through face-to-face interviews to collect data on sociodemographic features, seasonal influenza vaccination status, seasonal influenza vaccination recommendations, and knowledge of vaccination. Those serving as HCWs who willingly agreed to participate were included in the research. Healthcare workers who could not allocate time due to a busy work schedule or those who declined to respond to our inquiries were not included in the research. Surveys were administered after providing participants with detailed information about the study's content and obtaining voluntary consent through signed consent forms. In the initial section of the survey, participants were asked questions related to the study, including socio-demographic characteristics, years of professional experience, work units, seasonal influenza vaccination status, recommendation practices, to whom the vaccine should be administered, and the timing of vaccination. The second part of the survey consisted of 15 questions aimed at assessing the participants' knowledge regarding seasonal influenza vaccination. Participants were asked to mark the correct option if they believed the given statements were accurate, select the incorrect option if they thought the statements were false, or choose the "I don't know" option if they had no opinion on the matter. In this stage, one point was awarded for each correct answer, while zero points were assigned for incorrect answers or selecting the "I don't know" option. Following the assessment, the total scores for each participant were calculated within the range of zero to fifteen, where each participant received a score based on the number of correct answers. The total knowledge score was obtained by summing the correct answers provided by the HCWs included in the study. Accordingly, the average knowledge level of the participants in the research was determined to be 8.1±2.8, with a median of 8 (0–15). No open-ended questions were included in the evaluation questions.

The study was conducted in accordance with the Declaration of Helsinki, and the protocol was approved by the local Ethics Committee of the hospital (date: 16.01.2017; number 34/14).

Statistical analysis

Statistical analysis was performed using IBM SPSS Statistics for Windows, Version 22.0. (IBM Corp. released in 2013, Armonk, NY). Descriptive statistics are presented as the mean and standard deviation (minimum-maximum), median, frequency distribution and percentage. The normal distribution suitability of the variables was assessed using both visual methods (histogram and probability plots) and analytical methods (Kolmogorov-Smirnov). For the variables that were determined not to be suitable for normal distribution, the Mann-Whitney U Test was employed for the comparisons between two independent groups, and the Kruskal Wallis Test was used for statistical analysis among three independent groups. Categorical variables were analyzed using Pearson Chi-square Fisher's exact test. The statistical significance level was set at $p<0.05$.

Results

In our study, a total of 364 HCWs were interviewed. Among the participants, 261 (71.7%) were female, and 103 (28.3%) were male. The mean age was 30.3 9.8 years (min= 17, max: 60 years). A total of 207 (56.9%) were physicians, and 157 (43.1%) were other HCWs.

The distribution of the influenza vaccine status of the participants is presented in Table 1.

Table 1. The distribution of seasonal influenza vaccination status of the healthcare workers (n=364)[a]

	n (%)
Seasonal influenza vaccination status	
Never received	213 (58.5)
Irregularly received	130 (35.7)
Regularly received (every year)	21 (5.8)
Would like to receive seasonal influenza vaccination	
Yes, would like to	115 (31.6)
No, would not like to	249 (68.4)
The reasons for never received seasonal influenza vaccination (n=213) *	
Would not trust the influenza vaccine protection	128 (60.1)
Not be thinking to be in the risk group	83 (38.9)
Could not find the time	77 (36.1)
The side-effects of the vaccine	71 (33.3)
To think that influenza is dangerous	44 (20.6)
To think that there are harmful components in the vaccine	35 (16.4)
Needle phobia	7 (3.3)
To think he/she has natural immunity	4 (1.8)
Afraid of being infected after the influenza vaccination	3 (1.4)
The change of vaccine strains every year	3 (1.4)
The vaccine does not contain all strains	2 (0.9)
There is no need to be immunized	2 (0.9)
Allergic reactions after vaccination	1 (0.4)
Would like to develop natural immunity	1 (0.4)

[a] * – given more than one answer, percentage

Among the participants, 213 (58.5%) had never received the seasonal influenza vaccine. The reasons for their preference not to get vaccinated are listed in the same table. When all 364 participants were asked whether they wanted to receive seasonal influenza vaccination, 249 (68.4%) HCWs stated that they did not want to get vaccinated. When examining subgroups of HCWs, the annual rates of those who receive regular vaccination were as follows: among doctors, it was 8.7% (n=18), among allied HCWs, it was 2% (n=3). The rates of irregular vaccination were found to be 37.7% (n=78) among doctors and 33.1% (n=52) among allied HCWs. In both groups, the rates of not having received the seasonal influenza vaccine were 53.6% (n=111) among doctors and 64.9% (n=102) among allied HCWs respectively. For all three conditions, statistically significant values were found among doctors and other allied health personnel ($p<0.001$).

When examining the distribution of recommendations for the seasonal influenza vaccine among the study participants, 156 (42.9%) of the participants did not recommend the seasonal influenza vaccine. Among the reasons for not recommending the seasonal influenza vaccine, 85 (54.4%) stated that they did not think the vaccine was protective, 49 (31.4%) stated that they did not find the influenza vaccine safe, and 43 (27.5%) stated that they did not think the patients they encountered were in the risk group. One hundred eighty (49.5%) of the participants did not recommend the influenza vaccine to their relatives. The most prevalent reasons for not recommending were as follows: 102 (56.6%) stated that they did not think the vaccine was protective, 58 (32.2%) stated that they did not think their relatives were in the risk group for influenza, and 57 (31.6%) of them thought the side effects of the vaccine were too much, respectively.

The distribution of the answers in the study regarding the questions evaluating their knowledge level is shown in Table 2.

Table 2. The distribution of the answers towards the questions for evaluating the knowledge level of healthcare workers (n=364)

The questions for evaluating the knowledge level	Correct answer n (%)	Incorrect answer n (%)
Inactivated and live-attenuated types of influenza vaccines exist	214 (58.8)	150 (41.2)
Influenza is a disease caused by bacteria	289 (79.4)	75 (20.6)
The vaccination of the individuals who have a chronic disease is very important	317 (87.1)	47 (12.9)
The most common side-affect seen after vaccination is localized erythema and induration on the vaccination area	226 (62.1)	138 (37.9)
The live influenza vaccine is applied as intramuscular	155 (42.6)	209 (57.4)
Preservation is maximum in healthy individuals who are younger than 65 years	118 (32.5)	246 (67.5)
Influenza disease can be transmitted through small droplets that spread by coughing or sneezing	333 (91.5)	31 (8.5)
H1N1 which is one of the subtypes of Influenza A virus is called bird flu	102 (28.1)	262 (71.9)
In the influenza disease, the symptoms usually start 2 days after the contact with the virus and disappear within 1 week	222 (61.09)	142 (39.0)
Inactive vaccine is not given to children who are taking aspirin treatment	89 (24.5)	275 (75.5)
After the influenza vaccine is given, the protective antibody level occurs in usually 10-15 days and reaches the highest level in the 3rd week	218 (59.9)	146 (40.1)
Antiviral drugs and influenza vaccine are not taken together	115 (31.6)	249 (68.4)
Since influenza vaccine disrupts the blood sugar regulation, it should not be applied to patients with diabetes mellitus	194 (53.3)	170 (46.7)
Live-attenuated vaccine is not given to people who have egg allergy	195 (53.6)	169 (46.4)
Live-attenuated vaccine can be given to pregnant women	174 (47.8)	190 (52.2)

The statement with the highest percentage of correct answers was 'Influenza disease can be transmitted through small droplets that spread by coughing or sneezing,' with a rate of 333 (91.5%) participants answering correctly. The most common incorrect answer, at a rate of 89 (24.5%), was given to the statement 'Inactive vaccine is not given to children who are taking aspirin treatment.' The overall knowledge score

was calculated by summing up the correct answers given by HCWs. The participants' overall knowledge scores had an average of 8.1± 2.8 and a median of 8 (range=0–15).

A statistically significant difference in knowledge level was observed among occupational groups based on the total scores of the participants ($p<0.01$). The average total knowledge score of doctors was found to be 9.1±2.5, while that of other HCWs was 6.7±2.6. The total knowledge score of doctors was significantly higher than that of other HCWs.

When the distribution of total scores of physicians was analyzed regarding seasonal influenza vaccination status, it was found that the total score of those who had never received was 9±2.7, the total score of those who received regularly every year was 9.6±2.7, and the total score of those who received irregularly was 9.3±2.2. There was no statistically significant difference between the distribution of total scores regarding seasonal influenza vaccination status among physicians ($p=0.547$).

The analysis of the distribution of total scores regarding the seasonal influenza vaccination recommendation status of physicians, revealed that the average overall knowledge level score of those who recommended seasonal influenza vaccination was 9.5±2.3, while those who did not recommend had a score of 8.2±2.8. It was determined that the overall knowledge score of those who recommended seasonal influenza vaccination was higher ($p=0.003$).

Discussion

Vaccination is the most effective way to prevent influenza outbreaks. Although vaccination is an effective and cost-effective method, anti-vaccine opinions are becoming increasingly common not only in the general population, but also among HCWs.[13]

In a study conducted in Türkiye, it was determined that 6.7% of HCWs are regularly vaccinated every year, and fifty-five percent have never been vaccinated against influenza before.[14] Our findings were consistent with these results. In a study conducted by Lang et al. among HCWs in Switzerland, the rate of unvaccinated HCWs was found to be 59.8%.[15] A similar study conducted in Denmark showed that the non-vaccination rate among HCWs was 49%.[16] The situation remains unsatisfactory in low- and middle-income countries like Africa (6.5%) and Asia (8.84%), where a lower rate of influenza immunization among healthcare professionals (HCPs) has been documented.[17,18] In another study conducted in Finland, the vaccination rate among HCWs was found to be significantly higher at 83.7%, in contrast to the results observed in two other European countries, low- and middle-income countries, and our own study.[19]

When the vaccination rates of doctors and other HCWs were compared, similar results were in favor of doctors were obtained, consistent with the findings of studies conducted in other countries and our study.[15-19]

When the reasons for not getting vaccinated were examined, not trusting the effectiveness of the vaccine, not considering oneself in the risk group, and not finding a suitable time were the most common reasons, respectively. Although the rankings of the reasons for not being vaccinated vary in similar studies, their contents show significant similarities. In similar studies, it has been stated that the most common reasons for not getting vaccinated include not believing in the necessity of the vaccine and fearing potential side effects.[14-17] Hofmann et al.'s study revealed that HCPs concerns about adverse reactions may serve as a primary barrier to vaccination.[20] Although many studies in the literature have shown that such fears have no basis, the fear of side effects is still considered one of the main causes of low vaccination rates for all vaccines.[13,18] Moreover, it is known that the most crucial reasons necessitating HCWs to receive the vaccine include protecting themselves, and their patients and ensuring the protection of family members.[15,22,23,24]

According to the answer given to the question "whom should influenza vaccine be recommended to?" by HCWs who participated in our study, the rate of the answer "healthcare workers" 195 (53.6%) was less than expected. Unlike our study, in a study conducted in southern India, 93.28% of respondents were aware that the seasonal influenza vaccine was recommended for health workers, but only 52.1% expressed their intention to be vaccinated next year.[24] This study reveals a disconnection between knowledge of HCWs and their decision to get vaccinated. Interventions or strategies aimed at enhancing vaccination rates may need to address not only awareness but also other factors influencing HCWs' decisions, such as attitudes, perceptions, or systemic barriers. When examining the factors influencing the decision not to recommend vaccination, responses indicated a lack of belief in the protective efficacy of the vaccine, concerns about its safety, and the perception that the encountered patients were not in the high-risk group. It was observed that the participants had scientifically unproven worries and negative thoughts about influenza vaccine. On a global scale, the influenza vaccination rates for HCWs are estimated to vary between 2% and 44%. If HCWs are vaccinated at the recommended rates, the protection rate of their patients from this infection reaches 90%.[10] Adequate data supports the conclusion that influenza vaccines are both effective and safe.[10] In Eastern Europe, although confidence in vaccines among HCWs is high, there is still some hesitancy towards recommending seasonal influenza vaccines, particularly.[25] Negative thoughts and attitudes causing vaccine hesitancy have been observed in other similar studies in the literature.[23,26] HCWs with negative attitudes toward vaccinations tend to recommend them less often.[27,28] Therefore, increasing the knowledge

levels and awareness of HCWs may be useful in boosting both vaccination rates and vaccination recommendation.

When the knowledge level of the HCWs was evaluated, the most correct answer was given to the statement, "Influenza disease can also be transmitted through small droplets scattered around by coughing and sneezing." In a similar study conducted by Luo et al., HCWs were asked the same question, and it was observed that 98.65% answered correctly.[29] The total average score of all HCWs participating in our study is a maximum of 8.1 out of 15. The median value of the total score used to determine the level of knowledge is 8. The result that 52.4% of the HCWs who participated in our study remained below the median makes us think the participants had an insufficient knowledge level about influenza vaccination. In a cross-sectional study conducted in China, findings revealed that merely 50% of HCWs in Chongqing possessed a satisfactory understanding of influenza and its corresponding vaccine.[29] However, significant deficiencies in knowledge were also discerned; only 50.57% of participants believed that wearing masks can limit the spread of influenza, and just 58% agreed that the immunity afforded by the influenza vaccine is better than natural immunity.[29] Moreover, in some studies, a majority of HCWs believed that influenza can only be transmitted by symptomatic patients.[17,18,30] Therefore, it is necessary to ensure that opportunities are provided for HCWs to regularly update their information about influenza and vaccination.

The overall knowledge score of physicians was significantly higher than that of other occupational groups. There was no significant difference in the distribution of total scores due to the seasonal influenza vaccination status of physicians ($p>0.05$). Additionally, the study showed that although physicians with a moderate to high knowledge level constituted 86% of the participants, their regular vaccination rates were found to be less than half of the participants. The knowledge level of physicians who recommended seasonal influenza vaccination to their patients was higher than that of those who did not recommend. In the study conducted by Chen et al. in China, it was shown that the knowledge and attitudes of HCWs about the influenza vaccine had a meaningful relationship with their behavior.[31] Therefore, it was concluded that as HCWs' knowledge of the influenza vaccine increases, there is a likelihood that the rates of recommending the influenza vaccine to patients will also increase.

Our study has several limitations. Firstly, the study is based on a cross-sectional design; therefore, the findings cannot result in causality, as HCWs are evaluated in just one time frame. Secondly, the number of HCWs evaluated in the study is far below the total number of employees in our tertiary hospital. Generalizations of the results presented here should be done with caution. Third, vaccination data were collected using a self-reported survey, and the accuracy of the data from these HCWs was not verified based on their medical records.

Conclusion

This study revealed low vaccination rates for the influenza vaccine among HCWs. It is of great importance to increase the vaccination rates of HCWs, both in order to protect their own health and to protect other patients and employees from infections that may be transmitted. It is necessary to prioritize education on influenza vaccination to increase low vaccination rates and to determine the reasons for reluctance to get vaccinated. It is important to explain the necessity, effectiveness, and low side effects of the vaccine. It is essential to employ innovative strategies related to vaccines and use methods for encouraging vaccination in the community, as well as in HCWs, through communication channels that will enable us to reach many people. Through all these efforts, the knowledge and awareness levels of HCWs regarding the influenza vaccine can be increased, and the vaccination rates in the community can be raised.

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Declarations

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Author contributions

Conceptualization, M.A., S.D. and C.A.; Methodology, M.A., S.D. and C.A.; Software, M.A., S.D. and C.A.; Validation, M.A., S.D. and C.A.; Formal Analysis, M.A., S.D. and C.A.; Investigation, M.A., S.D. and C.A.; Resources, M.A., S.D. and C.A.; Data Curation, M.A., S.D. and C.A.; Writing – Original Draft Preparation, M.A., S.D. and C.A.; Writing – Review & Editing, M.A., S.D. and C.A.; Visualization, M.A., S.D. and C.A.; Supervision, M.A., S.D. and C.A.; Project Administration, M.A., S.D. and C.A.

Conflicts of interest

The authors declare no conflicts of interest in the research reported in this paper.

Data availability

The data sets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Ethics approval

The study was conducted in accordance with the Declaration of Helsinki, and the protocol was approved by the local Ethics Committee of the hospital (date: 16.01.2017; number 34/14).

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