

# Knowledge and attitudes of health professionals on the influenza vaccine

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## ABSTRACT

**Introduction:** Seasonal influenza is a condition that can be prevented by vaccination and annual vaccination against influenza is the most effective way to prevent the flu. Vaccination is especially important for people at higher risk of serious influenza complications such as patients with chronic diseases, pregnant women, young children, the elderly and healthcare personnel.

**Aim:** to investigate the knowledge and attitudes of healthcare professionals towards the seasonal flu vaccination.

**Methods:** The sample consisted of 120 healthcare workers. This small survey was conducted at a provincial hospital in Greece, where questionnaires were distributed to healthcare professionals on the subject of seasonal flu vaccination. The answers were analyzed by SPSS v.20 and the chi square test was employed for group comparisons. Results were analyzed for gender, age, educational level and occupational status, so that inferences could be made.

**Results:** 58% of the sample was female and the majority was aged between 31-41 years, while 40% were tertiary education graduates. The majority of the sample was nurses (52.5%). The majority of health professionals involved in our study agreed that vaccination is an important preventive measure for disease, such as seasonal influenza, and consider it dangerous if one is not vaccinated while working in a healthcare facility.

**Discussion:** The majority of our sample was vaccinated or was to be vaccinated during this survey. In the opinion of health professionals about the seasonal flu vaccine, they find it important to do so with those who come in contact with other people, and especially with patients.

**Conclusions:** This sample from a Greek provincial hospital was informed about the safety of the seasonal influenza vaccine and thus was happy to have the flu shot. However, further research on this important issue of influenza vaccination is needed.

The abstract should be concise and informative. It should not exceed 300 words in length. It should briefly describe the purpose of the work, techniques and methods used, major findings with important data and conclusions. Different sub-sections, as given below, should be used. No references should be cited in this part. Generally non-standard abbreviations should not be used, if necessary they should be clearly defined in the abstract, at first use.

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*Keywords:* Influenza, vaccination, Knowledge, Seasonal Flu

## **1. INTRODUCTION**

Influenza is an acute respiratory disease caused by influenza A or B virus. It often appears worldwide mainly during the winter season. A significant number of influenza viruses are present in the respiratory secretions of infected individuals, so the infection can be aerially transmitted by sneezing and coughing i.e. via droplets or by close contact. The mean duration of influenza virus infection period in adults is approximately 5 days, but may be longer (up to 10 days or more) particularly in children, the elderly, pregnant women, and those with chronic illnesses or immune-suppressed patients.

Flu symptoms usually begin with the abrupt onset of high fever, myalgia, headache and general malaise. These manifestations are accompanied by respiratory tract symptoms such as non-productive cough, sore throat and nasal discharge. After a typical course, the flu virus can affect other organs such as the lungs, brain and heart and in some cases can result in prolonged hospitalization or even death, especially in older frail people. According to data from the National Agency for Public Health flu's main outbreaks in Greece are January - March thus, vaccinations preceding this period are in order and highly needed.<sup>1</sup>

The most effective way to prevent an influenza epidemic is to administer annual vaccinations in late autumn. Among patients with severe disease, early onset of antiviral therapy (<2 days after onset of the disease) is associated with reduced morbidity and mortality, with greater benefits associated with early initiation of therapy.<sup>2</sup> According to the World Health Organization two types of influenza vaccines are widely available: The first one refers to Inactivated Influenza Vaccines (IIV) and the second to Live Attenuated Influenza Vaccines (LAIV).<sup>3</sup>

Traditionally, influenza vaccines have been produced to protect against 3 different seasonal influenza viruses (also called 'trivalent vaccines'). In most countries this remains the case and current trivalent vaccines contain the strains of influenza A (H3N2), pandemic A (H1N1) and 1 of 2 viruses of influenza B. However, vaccines that protect against 4 different viruses, including both influenza B viruses have recently been available in some countries.

Regardless of the type or composition of the seasonal influenza vaccine, vaccination should be administered annually to provide optimal protection against infection. According to the

European Center for Disease Prevention and Control, people with higher risk of serious complications should be vaccinated: persons with chronic illnesses, pregnant women and children, elderly and healthcare workers.<sup>4</sup> This type of influenza vaccine is approved for use in individuals 6 months of age and older, including pregnant women and those with chronic medical conditions. A dose is recommended which is infused into the thigh or the deltoid muscle. However, children aged 6 months to 8 years who have not received seasonal influenza vaccine during the previous influenza period should receive two doses administered at least four weeks apart. Vaccination against influenza during pregnancy will protect both the mother and the newborn from influenza.<sup>5</sup>

Although vaccines are strictly monitored prior to approval, the possibility of an adverse event cannot be completely ruled out due to annual changes in vaccine formulations, various vaccine patterns, environmental factors or genetic factors of the individual being vaccinated. Annual monitoring for vaccine safety is therefore essential. According to Li et al, (2016) side effects are extremely rare, i.e. one case in every 10,000 vaccinations.<sup>6</sup>

Along these lines, Esposito et al (2016) investigated the tolerability and safety of IIV in overweight and obese children aged 3 to 14 years, as obesity is an important risk factor for infections facilitated by respiratory diseases.<sup>7</sup> In overweight/obese children, the antibody response during IIV vaccination was similar or slightly greater than that observed in subjects with normal weight of similar age and this condition persisted for at least four months after vaccine administration. The incidence of local and systemic reactions was comparable between groups and no serious adverse events were observed, confirming that influenza vaccines have a good safety profile even in overweight/obese children.

A recent study shows that differences in production methods provide vaccines of different composition apart from the presence of a further antigen in Quadri-valent vaccines (QIV) which may be responsible for the different frequency of adverse reactions.<sup>8</sup> However, although QIV causes slightly more local reactions, such as pain in the injection site than TIV, the potential benefit of QIV to protect the population from infection is considerably greater.<sup>9</sup> An investigation following vaccination with trivalent IIV from 7/1/2013 to 5/31/2015 was conducted by Haber et al., (2016) reporting a similar safety profile between the two vaccines.<sup>10</sup> This was in line with the data obtained from studies prior to IIV4 licensing. Most of the adverse events reported were not serious. Among the most common adverse events in subjects from 6 months to 17 years of age was fever, swelling at the injection site and erythema, while pain in the extremities and pain at the injection site were more common in

subjects aged 18-64 years. The most common non-fatal serious adverse events were seizures, local reactions at the injection site and anaphylaxis.

The use of live attenuated viruses in LAIVs influenza vaccines may produce a stronger immune response by imitating the natural infection. Since intranasal administration, several adaptive immune responses are induced, such as serum antibodies, mucosal and cell-induced immunity.<sup>11</sup> The fact that no higher incidence of infections involving lower airways was observed supports the view that the virus is unable to replicate and pathologically stimulate the respiratory tract. LAIV is not recommended for elderly and immune-compromised individuals or those caring for people with severe influenza disease and carries a high risk. LAIVs are not recommended for children aged <2 years as, in the first investigations, the administration of LAIV in this age group promoted wheezing. In addition, LAIVs are contraindicated in severe asthmatics currently present in oral or high doses of inhaled glucocorticosteroids or having active fistula.<sup>12</sup>

A recent survey conducted by Turner et al. (2015) found a low risk of systemic allergic reactions following LAIV immunization in individuals aged 2-18 years, during the 2014-2015 influenza season in the UK. 35% of children had a history of anaphylaxis from eggs.<sup>13</sup> Direct adverse events after LAIV immunization were mild and self-limiting, such as localized urticaria, rhinitis, and parathormone pruritus. Delayed adverse effects possibly related to LAIV were lower respiratory tract symptoms, which occurred within 72 hours of vaccination. This higher incidence was reported in young children, but was not statistically significant.

### **1.1 Aim**

The purpose of this study is to investigate the knowledge and attitudes of healthcare professionals towards vaccination for seasonal influenza. The corresponding research questions are as follows: What are the views of healthcare professionals on seasonal influenza vaccine? Have they ever had a seasonal flu vaccine?

## **2. MATERIAL AND METHODS**

The survey was conducted in a provincial hospital in Greece, where questionnaires were administered to 120 healthcare professionals on vaccination for seasonal influenza. The responses were analyzed using SPSS v. 20 statistical program. Descriptive (mean, range, SD) and inferential statistics ( $\chi^2$ , Pearson's Chi-Square and Fisher's Exact Test) were employed to summarize data and compare group means with the level of significance set at

$p < 0.05$ . Each questionnaire comprised of some demographical data and 15 questions related to flu vaccination history, knowledge on the vaccine and attitudes towards it. The questionnaire's reliability and reliability were satisfactory, i.e. Cronbach's alpha was 0.88 and Pearson's  $r = 0.75$ , respectively.

### 3. RESULTS

According to our Power Analysis for sample size estimation, the recommended sample size was 120 participants for this study. To exceed this minimal recommendation, 150 questionnaires were distributed, and 120 were returned completed, i.e. an 80% response rate.

The sample's mean age was 32.3 years (SD = 4.7), range 23-62 years of age, with 69 females (57.5%) and 51 males (42.5) in the sample. With regards to their education level 45 (37.5%) had a Diploma, 63 (52.5%) Bachelors degree, 9 (7.5%) Masters degree and 3 (2.5%) had a Doctorate. As for the sample's profession, 71 (59%) were nurses, 23 (19%) doctors, 12 (10%) midwives, 8 (7%) biologist and 6 (5%) were technicians.

The sample was asked how important it was to them that their family was vaccinated. Their answers are as follows (table 1).

**Table 1: It is important that my family is vaccinated**

It is important that my family is vaccinated	Gender		Total
	Men	Woman	
Disagree	9	0	9
Neither agree nor disagree	0	9	9
Agree	0	39	39
Totally agree	42	21	63
Total	51	69	120

Pearson Chi-Square 20,904a , df=3,  $p < 0.05$

**Table 2: Vaccination should be mandatory due to the risk associate wth your profession \* Gender Crosstabulation**

Count

		Gender		Total
		Men	Woman	
It is important that my family is vaccinated	Disagree	0	9	9
	Nor agree/neither disagree	0	6	6
	Agree	0	36	36
	Totally agree	51	18	69
Total		51	69	120

Pearson Chi-Square 21,853<sup>a</sup> df=3, p

**Table 3: have or do you intent to 3 get the flu vaccination? (Gender Crosstabulation)**

		Gender		Total
		man	woman	
Have you been or are you going vaccinated for seasonal flu?	Yes	51	54	105
	No	0	15	15
Total		51	69	120

Pearson Chi-Square 4,224<sup>a</sup> df=1, p<04

When asked "Have you been vaccinated or are you going to be vaccinated with seasonal influenza vaccine?" all men and 18 out of 23 women answered "Yes" while 5 women said "No".

With regards to their sample's overall, immunization history, respondents were asked if they have had all relevant vaccines during their childhood. The great majority i.e. 75 (94%) people declared that they full coverage for childhood vaccines while the rest had missed a vaccine in order to reach full coverage.

**Table 4: Sample responses on whether or not it has been vaccinated with the seasonal influenza vaccine**

	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	105	87,5	87,5	87,5
Valid No	15	12,5	12,5	100,0
Total	120	100,0	100,0	

**Table 5: Update of the sample on the safety of seasonal influenza vaccines**

	Frequency	Percent	Valid Percent	Cumulative Percent
No information	6	5,0	5,0	5,0
Non-satisfactory information	9	7,5	7,5	12,5
Satisfactory information	30	25,0	25,0	37,5
Very good information	75	62,5	62,5	100,0
Total	120	100,0	100,0	

The majority of the sample, 25 out of the 40, out of 62.5%, gave the answer "I have very satisfactory information". 10 out of 40 people, 25% gave the response "I have satisfactory information", 3 out of 40 replied "I have moderate/unsatisfactory information" and 2 people replied that "they have no information" on the safety of seasonal influenza vaccines.

Table 5: Sample attitude regarding whether to advise others to make the seasonal influenza vaccine

**Table 6: If you have received seasonal influenza vaccine, would also advise others to have it too?**

	Frequency	Percent	Valid Percent	Cumulative Percent
Totally disagree	3	2,5	2,5	2,5
Disagree	9	7,5	7,5	10,0
Neither disagree/nor agree	27	22,5	22,5	32,5
Agree	42	35,0	35,0	67,5
Totally agree	39	32,5	32,5	100,0
Total	120	100,0	100,0	

Pearson Chi-Square 4,224<sup>a</sup> df=2, p<04

The majority of the sample, i.e. 35% and 32.5% gave the answers "I agree" and "I fully agree", i.e. 14 and 13 people out of 40 for each answer, respectively. 9 persons, 22.5% gave the answer "Neither disagree nor agree", 3 persons, 7.5% replied that disagree and 1 person, 2.5% gave the answer "I disagree completely".

#### **4. DISCUSSION**

In Greece flu cases usually start to rise in January, and peak in February-March, according to the latest data from the National Agency for Public Health (2019). As emphasized by the Greek Ministry of Health, vaccination is necessary to be repeated every year, especially for high-risk sensitive groups, as it is the most effective and safest available preventive instrument for the disease.<sup>14</sup>

Yet, it is not only vulnerable groups, such as the elderly, children and pregnant women who need to be vaccinated but also those working in health facilities as they come in regular contact with patients.

This survey was carried out in a provincial hospital in the country and showed that the majority of health professionals have been vaccinated or were to be vaccinated with the influenza vaccine and considered it important that all members of their family are vaccinated as well.<sup>15</sup> Flu vaccination is not compulsory for Greek healthcare professionals, yet they believe that, because of their profession whereby they come in daily contact with patients, they are more likely to contract the influenza virus themselves and transmit it in turn to others.<sup>16</sup>

The majority of the sample sustains that vaccination is an important tool for protecting public health in general and especially for healthcare professionals and would suggest that other vulnerable groups should be vaccinated too.

#### **5. CONCLUSION**

Although the majority considers that it is well informed about the safety and possible side effects of influenza vaccines, there were not, however, few people in our sample who replied that they had not been informed nor had moderate or unsatisfactory information. So there is an urgent need for information, as cases of the virus have already resurfaced.

However, there were some in our sample who did not have or did not intend to have the flu vaccine and considered that they did not pose a risk to their colleagues or patients in the healthcare sector where they are working. This finding suggests that more input is needed in order to convince healthcare professionals (especially those susceptible to seasonal flu) on the merits of the flu vaccine and their corresponding professional responsibilities towards their patients.

## **LIMITATIONS**

This study has potential limitations, namely the two main limitations of this study were the relatively small sample size and its rather narrow geographical distribution. Thus, a further study is recommended whereby more health care professionals from various parts of the country would be included.

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## **CONFLICT OF INTEREST**

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

## **FUNDING**

The authors would like to declare that there was no funding for this work.

## **CONSENT**

Written consent has been obtained from the survey respondents.

## **Ethical Approval**

The study was conducted according to the guidelines of the Ethics Committee, Nursing Department, International Hellenic University, Greece.

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