Original article

Factors influencing influenza vaccination among nurses in teaching hospitals of Yazd University of Medical Sciences in 2011

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Abstract

Background and Purpose: Influenza (flu) causes many hospitalization and death in the year. It is recommended health care workers (HCW) receive the annual flu vaccine. But studies have shown that a few of medical staffs are vaccinated against flu. This study was conducted to determine the incentives and disincentives of flu vaccination in nurses.

Methods: This cross-sectional study was conducted among 200 nurses in teaching hospitals in Shahid Sadoughi University in 2011. The Samples were selected randomly. The data collection tool was a 35-point self-administered questionnaire about the incentive and disincentive for flu vaccination. Frequencies, percentages, mean, standard deviation, and chi-square were used for statistical analysis.

Results: According to the findings, 32.5% of nurses were vaccinated, the main factors for encouraging vaccination were: personal protection (95%), family safety (25.5%), not being concerned about spreading the disease (18%), and following other health workers (26.5%). The main factors inhibiting for the vaccination were: not believing in the effectiveness of the vaccine (26%), lacking of information about vaccine (31%) and not being worried about flu (26%).

Conclusion: Based on the results, the incentives for vaccination in nurses were protection against the disease and the persuasion of other HCWs. The most inhibitors were the high cost of vaccination and lack of knowledge about flu vaccination. It is, therefore, necessary to promote vaccination in nursing staffs by offering more facilities such as vaccination in the workplace, providing free immunizations and educational actions.

Keywords: Incentive factors, Disincentive factors, Influenza vaccination, Nurses.

Introduction

Influenza is one of the most common diseases in humans that is of concern to any society in general and in particular health institutions (1). It causes many hospitalizations and deaths every year (2, 3). Center for Disease Control (CDC) has recommended using annual flu vaccination in Health Care Workers (HCW) (4). This proposal has been confirmed by the other medical and nursing groups and infection control centers (5, 6). Vaccination of HCWs against seasonal flu has recommended for preventing the transmission of nosocomial infections and ensuring of health services safety (7). But studies have shown flu vaccination is low and not satisfactory in the HCWs (8,9,10). The adherence to flu vaccination is 40% or less. Surprisingly, adherence rate is lower among nurses, although they are more exposed in their daily lives to infectious diseases

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than the population in general. Once infected, they may sicken or, even not getting sick, transmit the infection to other patients and staffs within the institute. Serologic evidence shows that 13%- 23% of HCWs are infected with flu virus each year and that about 50% of those infected present mild symptoms or are even asymptomatic, many remain working under this condition, which causes spreading of the disease in the workplace (1). The HCWs are suffering from the flu transmits infectious virus especially to at-risk patients (such as the elderly, children, refractory patients and patients with underlying diseases), which leads to increase in mortality in this group of patients and financial expenditures (1,11,12). So, flu vaccination reduces the risk of flu in individuals and transmission to another person, especially the vulnerable population (13). But there are several barriers in the perceptions and attitudes of HCWs for flu vaccination that impact on vaccine. It is necessary to find those factors (14). On the other hand, identifying these factors will be an essential step to improve vaccination (13,15). However, in others research factors affecting flu vaccine have not been considered adequately (16). Tagaj did et al (2011) showed that little is known about the immunization rate among at-risk groups in all countries, and the acceptance of flu vaccination between HCWs is not high (17). Research findings are limited especially about nurses (18). So, this study examined the incentives and disincentives to flu vaccination among nurses in Yazd.

Materials and Methods

This cross-sectional study was conducted in 2011. Samples were nurses that working in teaching hospitals in Shahid Sadoughi University of Medical Sciences and Health Services in Yazd. Statistical analysis was considered statistically significant at $p<0.05$, with 95% confidence interval. These parameters of the sample size were determined by using a pilot study. 200 questionnaires out of total of 215 distributed questionnaires were analyzed. The samples were collected randomly. Participants must have at least one year record of service. The data collection tool was a researcher made questionnaire consisting of four parts. Demographic information was about age, gender, work experience, ward nurses, and job position. The questions about incentive factors included 15 items (personal protection, preventing bsenteeism, serious flu, patient's protection, catching the flu before**,** belief in the vaccine effectiveness, not being concerned about spreading the disease, family safety, advertising, encouragement of colleagues, chronic illness, getting vaccine information from media, physician consultation, friends and family with the flu, following other health workers). The questions about inhibitor factors for flu vaccine contained 15 items (rarely getting the flu, having no time to get the vaccine, being unfamiliar with the vaccine, fearing of adverse events, forgetting to vaccinate, believing in the safety and efficacy of natural health, being pregnant or planning a pregnancy, having no contact with patients with flu symptoms, believing in being in a low-risk population, fearing of needles, the high cost of the vaccine, being unfamiliar with the vaccine provider, having no chronic disease). The last part of the questionnaire included the questions regarding the strategies for promoting vaccination (educational actions, free or subsidized vaccines, high-quality advertisements in media and health centers, immunization information systems, vaccination in the nurses ward). Participants answered **"**Yes" or "No" for each item. In this questionnaire, the questions about incentives and disincentives refer to personal factors and questions regarding strategy for promoting vaccination referred to organizational and external factors. The face & content validities of the questionnaire were confirmed by judgments of five members of the faculty. Test-retest reliability was assessed with a 10-day interval in ten nurses ($r=0.86$).

For the study, the researchers obtained the permission from the authorities and the subjects were selected based on the work program of nursing in each hospital. The research was conducted among nurses in shift work, and the purpose of the study was explained. After obtaining consent from participants, the survey questionnaire was given to be filled in self-report method. The questionnaires were analyzed using SPSS software (version 16) by using descriptive statistics, frequency, mean, standard deviation and chi-square analysis.

Results

Of the 215 nurses given the questionnaires, 200 (93%) returned usable ones. According to the results of descriptive statistics, 18.5% of participants in the study were men and 81.5% were female, 59% were in the age group of 23-33 years old, 35.5% in 34-44 years old, and 5.5% in the age group over 45 years old. 7.5% were head nurses, 88.5% nurses and 4% assistant nurses. The average of work experience was 12.87±5.27.

About 42% of participants were employed in critical care units such as ICU, CCU and dialysis, emergency department and infectious diseases ward and other participants were in other wards, such as internal, surgery, pediatrics, etc. Only 32.5% of subjects reported receiving vaccination.

The encouraging factors in flu vaccine consisted of personal protection (95%), advertising (1%) and preventing absenteeism (1%) (Table1). The inhibiting factors in flu vaccine were the high cost (57.5%), and having no chronic disease (4.5%) (Table 2).

Nurses participating in the study expressed that the best strategy to promote flu vaccination was vaccination at the worksite (95%), and the least strategy was establishment of immunization information systems (7.5%) (Figure1).

Table 1. Distribution of the incentive factors affecting influenza vaccination uptake in teaching hospitals of shahid Sadoughi University in 2011

Encouraging factors for influenza vaccine	Yes		No	
	frequency	Percent	frequency	Percent
Personal protection	190	95%	10	5%
preventing absenteeism	2	1%	198	99%
serious flu	7	3.5%	193	96.5%
patient's protection	5	2.5%	195	97.5%
catching the flu before	25	12.5%	175	87.5%
belief in the vaccine effectiveness	6	3%	194	97%
not being concerned about spreading the disease	36	18%	164	82%
family safety	51	25.5%	149	74.5%
advertising	2	1%	198	99%
encouragement of colleagues	12	6%	188	94%
chronic illness	19	9.5%	181	90.5%
getting vaccine information from media	14	7%	186	93%
physician consultation	33	16.5%	167	83.5%
friends and family with the flu	28	14%	172	86%
following other health workers	53	26.5%	147	73.5%

Table 2. Distribution of the disincentive factors affecting influenza vaccination uptake in teaching hospitals of shahid Sadoughi University in 2011

Inhibitor factors of influenza vaccine	Yes		No	
	frequency	Percent	frequency	Percent
no believe in the effectiveness of vaccines	52	26%	148	74%
rarely getting the flu	24	12%	176	88%
having no time to get the vaccine	18	9%	182	91%
being unfamiliar with the vaccine	62	31%	138	69%
fearing of adverse events	42	21%	158	79%
forgetting to vaccinate	32	16%	168	84%
believing in the safety and efficacy of natural health	15	7.5%	185	92.5%
being pregnant or planning a pregnancy	25	12.5%	175	87.5%
having no contact with patients with flu	22	11%	178	89%
believing in being in a low-risk population	52	26%	148	74%
fearing of needles	13	6.5%	187	93.5%
the high cost of the vaccine	115	57.5%	85	42.5%
being unfamiliar with the vaccine provider	34	17%	166	83%
Breastfeeding	12	6%	188	94%
having no chronic disease	9	4.5%	191	95.5%

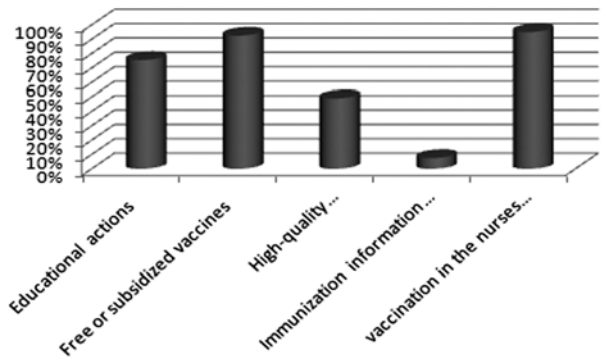

Figure 1. Distribution of Strategies affecting influenza vaccination uptake in teaching hospitals of Shahid Sadoughi University in 2011

According to the results, there was no significant difference between gender (male 48% and female 54%), job position (head nurse 34%, nurse 38% and assistant nurse 28%) and receiving flu vaccination ($p<0.05$).

But there was a significant relationship between the place of employment (intensive units 72% and general units 28%), age (age group 23-33 years old 60.5%, 34-44 years old 23.5%, over 45 years 16%), work experience (less than 10 years 68.5%, more than 10 years 31.5%) and receiving flu vaccination ($p<0.05$).

Discussion

According to this study, about one-third of nurses have received flu vaccination. According to Stathopoulou and Skourti (2010) there are several studies reporting vaccination rates of HCWs at health care facilities. Flu vaccination rates vary widely among countries, vaccination rates have been reported 6% and 21% in France, 7% in the United Kingdom, 21% in Spain, 24% in Italy, 22% in New Zealand, 34% in Brazil (19). Cihan et al (2012) showed that in Turkey, the seasonal flu vaccination rate for all participants was 16.7%, although 9.5% of the study group had a chronic disease (20). Aguilar-Díaz Fdel et al (2011) stated vaccination intention and uptake vary among different countries, 13.5-89.0% and 7.5-63.0%, respectively (21). Honarvar et al (2012) in a study in the staff of public hospitals in Shiraz wrote 135 (65%) had been vaccinated in previous year (22). It is necessary to identify incentives to improve and raise immunization rates, and remove barriers to immunization.

In this study, the incentives for flu vaccination were: personal protection, following other health staffs, family safety, not being concerned about spreading the disease, consultation with the doctor, catching the flu in friends and family, catching the flu before, chronic disease, encouragement of colleagues, receiving information from the media, serious flu, belief in the effectiveness of the vaccine, patient's protection, advertising, and preventing absenteeism, respectively. According to Corace et al (2013), HCW attitudes toward vaccination significantly predicted vaccination. Key motivators driving HCW vaccination include: 1- desire to protect family members and patients, 2- belief that vaccination is important even if one is healthy, 3- confidence in vaccine safety, and 4- supervisor and physician encouragement (23). Toy et al (2005) showed that immunization rates were significantly associated with media influence, whether they knew co-worker who were vaccinated, awareness and knowledge, being at the risk due to the nature of the job, the risk of transmission to patient, effectiveness of vaccines, general safety, risk of flu, encourage other employees and chronic diseases (24). Brunton et al (2004) suggested that more than 99% of doctors and nurses had the positive attitudes about the risk of flu and 97% believed the vaccine reduces the risk of illness (25). In the study of Aguilar-DíazFdel et al (2011) the main predictor of vaccine uptake was having received previous flu vaccination. Shahrabani et al (2009) showed nurses who were vaccinated had higher levels of knowledge regarding the vaccine and flu and perceived seriousness of the illness. They also recommended some efforts should be made to educate nurse regarding the benefits of vaccination and the potential health consequences

of flu for their patients, and themselves. Thus, increasing nurses' knowledge about flu and the vaccine is very effective steps to encourage vaccination (26). Overall, incentives are opportunities for partnerships in flu immunization.

In this study, the inhibitors of flu vaccine were: high cost, lack of knowledge and information about the vaccine, lack of belief in the effectiveness of the vaccine, not being at the risk of flu, concern regarding adverse events, forgetting to vaccinate, being pregnant or planning a pregnancy, unfamiliarity with providers center, flu , fear of pain and needles, no time to get the vaccine, natural health and safety, breastfeeding, no contact with patients with flu symptoms and not having a chronic illness. Aguilar-Díaz Fdel et al (2011) showed that most common reasons for rejection were fear of adverse events, doubt regarding efficacy, not feeling as belong to at-risk group and believing that flu is not a serious illness (21). Similar results in a study of Toy et al (2005) about effecting factors uptake vaccine have been reported. They were: forgetting or postpone, lack of interest, not at risk for flu, no chance of catching the flu, ineffectiveness of flu vaccine, fear of injections, adverse events, believing that flu is not a serious illness, lack of knowledge about how to reach and allergic to the vaccine (23). Honarvar et al (2012) found the most common causes of flu vaccination declination were belief of not getting flu (30%), distrust about vaccine efficacy (24%) and concern about adverse reactions of flu vaccine (19%) (22). Canning et al. (2005) stated that the main reasons for not being vaccinated were: did not think it was needed (29%), unaware of the vaccine (18%) and concerned about adverse events (11%) and it's a lack of awareness and understanding of the vaccine, especially on its benefits and adverse events (27). Lee et al (2005) showed 42.9% of samples considered that they knew a lot about vaccine; however, 36.2% reported no education about vaccination during their training, although 55.9% were in favour of vaccination in general. Only 37% believed that flu vaccine was effective (28). So, it seems education regarding the importance of flu vaccine helps to remove barriers to flu vaccination.

In this study, according to the participants' view the strategy for flu vaccine were vaccination in the workplace, free or low cost vaccine, healthcare education, emphasis by the media and health centers and immunization information systems. Akiko et al (2007) believed that influenza vaccine coverage of HCW can be improved by providing free vaccinations at the worksite with a Vaccine Day (29).

However, Hofmann et al (2006) indicated that free vaccination and educational programs had no significant effects on vaccination. The main barriers to vaccine uptake consistently reported were misconception of flu, its risks, the role of HCWs in its transmission to patients, and the importance and risks of vaccination (30).

The other purpose of our research was the demographic variables associated with vaccination. Results of statistical tests did not show a significant relationship between the gender, organizational positions and vaccination. However, there was a statistically significant relationship between work experiences, ward nurses and vaccination**.**

In the present study, nurses who were working in intensive wards such as ICU and CCU, dialysis, emergency department and infectious ward were vaccinated more than other wards. Novice nurses and less experienced ones received flu vaccine more than experienced and older nurses. This difference was significant, which was probably due to their perceptions and concerns about the flu.

The strengths of the study: this study is the first to be conducted specifically for nurses and samples were selected from different wards of the hospital. Like any other research, limitation of this study was that 15 subjects did not return the questionnaire. However, the response rate of 93% was high. There was no problem with the content of research. The study results and conclusions are valid and generalizable.

Conclusion

It is necessary to strengthen the preparation of incentive factors such as educating nurses regarding the effects and benefits of the vaccine for themselves, their families and patients, reducing cost, and providing a comfortable and convenient location for flu vaccination in the workplace. In order for overcoming barriers to flu vaccination, it is necessary to consider some facilities such as offering vaccine at no or low cost. Hence, the main key to a successful strategy to increase immunization is vaccination in the workplace, free or subsidized vaccine, and education.

Conflict of interests

The authors declare that they have no competing interests.

Author's Contributions

Mahmood Nouri Shadkam has contributed to the concept, design, and manuscript preparation. Khadijeh Nasiriani has contributed to the concept. design, data acquisition, data analysis, manuscript preparation, manuscript editing, and manuscript review. Hamide Dehghani has contributed to the design, data acquisition, statistical analysis, and manuscript editing.

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