Health care workers' participation in influenza vaccination programs.Application of the PRECEDE- PROCEED model.

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Abstract

Influenza vaccination of Health Care Workers (HCWs) is recommended by several health authorities worldwide aiming to prevent influenza, to reduce staff absenteeism due to illness and to protect vulnerable patient populations from the increased morbidity and mortality that influenza carries. However, despite recommendations and proven efficacy and cost effectiveness of influenza vaccine, vaccination rates are persistently low globally.
Aim: The aim of this study was to identify the factors that influence HCW's decision to participate in flu vaccination, to classify them according to the PRECEDE-PROCEED model of health promotion planning and to summarize the characteristics of health promotion interventions that have proved helpful in increasing influenza vaccination rates among health care workers.
Methods: A literature review was performed in MEDLINE and SCOPUS databases during the last decade. Keywords used included: influenza vaccination, health care workers, health promotion interventions and their combination as appropriate.
Results: The results of the study revealed that worry about transmission of influenza to relatives knowledge about vaccination effectiveness and trust in it, previous flu vaccination, social pressure and convenience in terms of time and place are some of the factors encourage HCW vaccination, whereas concerns over potential side effects, mistrust in vaccine effectiveness and perception of low susceptibility are the main barriers to HCW acceptance of influenza vaccination.
Conclusions: Effective interventions utilize educational and vaccine promotion campaigns, ensure convenience for employee participation in vaccination, provide free vaccine and small incentives, emphasize influenza vaccination as a patient safety issue and rely upon active management support in order to succeed.

Keywords: Health care workers, influenza vaccination,health promotion, interventions

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Introduction

Influenza vaccination of Health Care Workers (HCWs) is recommended by several health authorities worldwide, for example the Centers for Disease Control[1] and the Association for Professionals in Infection Control[2], aiming to prevent influenza, to reduce staff absenteeism due to illness and to protect vulnerable patient populations from the increased morbidity and mortality that influenza carries.

Additionally, the Hellenic Center for Disease Control and Prevention recommends that influenza vaccination should not be limited to staff providing direct patient care, but should be provided as well to clerical, cleaning and security personnel in health care facilities[3].

Influenza vaccines have proven efficacy against influenza, with efficacy rates ranging from 50 to 80% depending on the degree of matching between vaccine and circulating influenza strains[4]. Moreover, the vaccine is cost - effective and cost – saving[5].

However, despite recommendations and proven efficacy and cost effectiveness of influenza vaccine, vaccination rates persist to be low internationally.

There are several studies reporting vaccination rates of HCWs at health care facilities. Influenza vaccination rates vary widely among countries, for example vaccination rates of 6% and 21% have been reported in France [6,7], 7% in the United Kingdom[8], 21% in Spain[9], 24% in Italy[10], 22% in New Zealand[11], 34% in Brazil[12].

Surprisingly, there are relatively few studies reporting vaccination rates at national level, for example in USA a vaccination rate of 40% has been reported[1], 21% in Germany[13] and 16% in Greece after the introduction of a nationwide influenza vaccination promotion campaign[14] .

Extensive research has been conducted in order to highlight the factors that either encourage or inhibit HCWs from getting vaccinated for influenza. The knowledge and consideration of these factors is crucial in the design and implementation of interventions aiming to promote influenza vaccination uptake among health care workers.

This paper reviewed the international literature with the aim to:

- identify the personal and institutional factors that act as barriers to immunization uptake and the factors that reinforce staff participation to influenza immunization programs
- classify the factors that either encourage or hinder influenza vaccination according to the PRECEDE – PROCEDE model of health promotion program planning
- summarize the characteristics of successful interventions
- address the issue of mandatory versus voluntary vaccination policies

PRECEDE – PROCEDE model

The PRECEDE-PROCEED model is suggested as a successful analysis tool for health education on a national scale, but also as an organizing framework for curriculum development in health education for health professionals[15]. It is characterized as a robust model, which can propose solution to the usual problem of the disjointed planning in health education programs. According to the PRECEDE framework, the health educator can overcome this problem by planning an intervention process intending to identify the reasons why a wrong health behavior exists and diagnose the factors, that influence it[15].

The solid knowledge base of those factors and the recognition of the interacting relationships between them and health behavior can help planners design effective interventions with realistic [16] and measurable targets.

The diagnosis procedure of the community health problem, which the PRECEDE- PROCEED model proposes, consists of five major phases: social, behavioral and environmental, educational and organizational, administrative and policy phase[15].

During the behavioral and environmental diagnostic phase, the planner can recognize and classify the factors causing a particular health behavior in three main categories: predisposing, reinforcing and enabling factors[15]. Definitions of these factors are provided below.

- Predisposing factors : those antecedent to behavior and that provide the rationale or motivation for the behavior, such as knowledge, beliefs, values and attitudes
- Enabling factors : those that allow a motivation or aspiration to be realized, such as personal skills and resources and also community resources
- Reinforcing factors : factors which provide either continuing reward or punishment and also incentive for a behavior or for persistence extinction.

Considering that behavior is a multifaceted phenomenon, any ambitious try to plan health behavior changing intervention, should take into account the interaction between behavior and those factors that PRECEDE-PROCEED model proposes[15].

The PROCEED part of the model includes four phases comprising the implementation and the evaluation of the process, which gives to the health educator the opportunity to evaluate the process (ie the extent to which the program is being carried out according to plan), the impact (ie changes in influencing factors) and finally the outcome of the intervention (ie the affect to health and quality of life indicators)[17].

PRECEDE – PROCEED appears to be a well –suited health promotion planning model for application to the workplace. As Green and Kreuter have pointed out, it is crucial that the health promotion planner maintains a neutral stance between management and employees' position and suggest that PRECEDE- PROCEED can help towards this end in 2 ways[16]:

- Social diagnosis can potentially promote management and employee collaboration
- Epidemiologic, behavioral and environmental diagnosis help recognize workplace hazards and facilitate consequent environmental changes

Considering that the problem of insufficient influenza vaccination rates among health care workers is well documented, we conducted a literature review aiming to summarize and classify the factors that influence employees' decision for influenza vaccine uptake. We searched MEDLINE, CINAHL and SCOPUS databases during the past five years using the keywords "influenza vaccination", "health care workers", "interventions", "vaccination barriers", "attitudes".

The search yielded numerous studies, which have been evaluated and consequently, the factors that had an impact on health care workers' decision to receive influenza vaccination were classified accordingly to the PRECEDE-PROCEED framework.

Factors that encourage HCW influenza vaccination

A number of factors that correlate positively with acceptance of influenza vaccination by HCWs have been identified and they can be classified as predisposing, reinforcing and enabling factors.

Predisposing factors

Older age, in particular, being more than 45 years old was a factor found to be associated with improved compliance to influenza vaccination[12,18,19]. Additionally, considering influenza a potentially serious disease appeared to motivate HCW's to undertake influenza vaccination[10]. An interesting finding was that previous influenza vaccination was a factor that encouraged future vaccine uptake [7, 20, 21]. Moreover, the desire to protect patients' health but also, the worry over potential transmission of influenza to family and relatives were both influencing HCW's decision to accept vaccination in a positive way [7,20].

Trust in vaccine effectiveness was also associated with increased compliance[12, 21].

A significant factor that influences vaccination uptake is knowledge. Being informed about the vaccine, having high knowledge scores regarding the vaccine and it's benefits [12, 22, 23] and being aware of the population groups for which vaccination is strongly recommended[10] were all related to increased vaccine uptake among HCWs.

Finally, acceptance of recommendations concerning influenza vaccination was another factor that had an effect on HCW decision to vaccinate against influenza[20].

Reinforcing factors: From the literature review it emerged that two factors have a reinforcing action towards HCW influenza vaccination. These are the belief that most of their colleagues have been vaccinated, which exercised some form of social pressure to HCWs[12] and the degree of identification of HCWs with their professional group, which was correlated with perception of influenza vaccination as a professional duty [23].

Enabling factors: Two enabling factors were recognized. The existence of free time for vaccination[20] and the provision of personal advice concerning influenza vaccination [20] largely facilitated HCW vaccination.

Factors that inhibit HCW participation in influenza vaccination

With regard to barriers to influenza vaccination, certain factors have emerged form the literature review and they all are classified as 'predisposing factors', as they express mainly knowledge, beliefs and values towards influenza vaccination.

The most commonly cited barriers to influenza vaccination are concern about vaccine side effects [8, 21,24, 25], doubt about vaccine effectiveness [24,26], perception of low susceptibility to acquiring influenza [6, 24,25,27] and the widespread perception that influenza vaccine can actually cause flu[18, 26,27].

Other less common factors that inhibit influenza vaccination among HCWs are lack of awareness of influenza vaccine [8], opposition to vaccines by principle [6], the perception that the use of other preventive measures and the application of safety precautions eg hand washing, wearing face masks [27] are more effective in preventing flu and finally being in good health [25] and believing that homeopathy medication is more effective in preventing influenza[7].

In Greece, recent research has highlighted the specific reasons that HCWs cite for not complying with influenza vaccination recommendations. In a nationwide survey conducted by the Hellenic Center for Disease Control and Prevention, it emerged that the most commonly cited reason for non vaccination of HCWs was the perception of not being at risk of acquiring influenza, followed by the fear of adverse drug reaction and finally, mistrust in the effectiveness of the vaccine[14]. These findings were confirmed by Raftopoulos[25] who conducted focus groups interviews with the participation of 30 nurses in Greece. Additionally, it emerged from this study that the delayed availability and distribution of the flu vaccine along with the lack of information regarding vaccine effectiveness were cited by the participants as reasons for opting out of influenza vaccination.

All the above mentioned findings in conjunction with the low vaccine coverage rate in Greece clearly suggest the need for health promotion interventions designed to address the specific issues that research has identified as major obstacles in HCW vaccination uptake in Greece.

Of special note is the fact that there appear to be marked differences in vaccination acceptance between different occupational groups within the health sector. It has been consistently reported that nurses present lower vaccination rates compared to physicians[7,21,28] and surprisingly, non clinical staff (clerical or housekeeping staff) presents higher vaccination rates than nurses [11,22].

Nurses are in close contact with patients for the purpose of care provision, therefore can easily spread influenza. This makes them a crucial factor in influenza prevention efforts and points out to the need for vaccination promotion interventions that

are especially targeted to nurses and that address the particular obstacles to vaccination that apply to this unique occupational group.

Characteristics of successful interventions for the promotion of influenza vaccination of HCWs

Several interventions have been implemented worldwide in order to address low influenza vaccination rates among HCWs. The characteristics that account for the success of such interventions can be summarized as follows.

Educational and vaccine promotion campaigns have proven useful in increasing vaccination rates. These include publication of the campaign and information concerning influenza vaccination recommendations on the hospital's internal bulletin and on the hospital's website[9], use of posters, leaflets and educational material for example Powerpoint presentations[13], establishment of dedicated "Vaccination days" each year [29].

Additionally, free provision of the vaccine [26,29], visit of physician and nurse from Preventive Medicine Department in clinical areas in order to administer the vaccine on site[9], ensuring convenient time and place for offering vaccination [27], use of mobile cart visiting all hospital units on several occasions [6,18] are valuable strategies who can facilitate HCW vaccination.

Other effective strategies include placement of special emphasis on promoting the vaccine as a patient safety issue [22, 27], provision of small non monetary incentives for example offering food on vaccination[19] or free T-shirts[18] and use of mandatory vaccine declination forms to be filled in by all HCWs who refuse vaccination[18].

Role modeling appears to play an important role in motivating HCWs to vaccinate, for example vaccination of the head of Medical Departments has been reported to encourage staff to participate in influenza vaccination[6].

Finally, active management commitment and support for vaccination facilitation[22] are necessary prerequisites for the success of all vaccination promotion efforts.

Mandatory versus voluntary participation in vaccination programms: the debate

Mandatory vaccination of HCWs has been proposed as a measure to address the persistently low vaccination rates that are observed worldwide. The meaning of "mandatory vaccination" warrants further clarification. As Van Delden et al.,[30] state ,"mandatory vaccination" does not refer to vaccination against the persons' will, but rather to the refusal of the employer to allow unvaccinated persons to work.

There is an ongoing debate regarding the ethical principles underpinning the strategy of mandatory vaccination. Certain arguments in support of mandatory vaccination of HCWs exist, for example, as McLennan et al., [31] point out, the respect of the ethical principles of beneficence (ie acting to the benefit of patients) ,non maleficience (ie obligation not to harm patients) and the principle of trust, which implies that unvaccinated HCWs are in bad faith towards patients. Moreover, there is also claim to the example of other vaccinations mandatory for HCWs for example Hepatitis B vaccine, measles and rubella vaccine[32].

However, these arguments are outweighed by the claim that mandatory vaccination violates the principle of autonomy and by several drawbacks that mandatory vaccination presents for example the coercive nature of this procedure and the consequent compromise of trust between the employer and the employee [33].

Conclusion

The literature offers a significant amount of evidence concerning barriers and encouraging factors that influence HCW participation in vaccination programs. It seems that these research findings suffice to provide the evidence base for planning and implementation of interventions to promote influenza vaccination uptake among HCWs.

There is urgent need for health promotion interventions specifically tailored to address barriers to HCW vaccination, taking into account the full array of predisposing, re-enforcing and enabling factors for vaccination.

It is crucial that nurses maintain a positive attitude towards influenza vaccination, demonstrated by enthusiastic participation to vaccination campaigns and by active promotion of the vaccine to patients.

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