ORIGINAL RESEARCH ARTICLE ACHAIKI IATRIKI | 2021; 40(3):143–147

Considerations regarding adult vaccines by health care professionals. The experience of a university hospital in western Greece

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Abstract

Background: Vaccination issues cause increasing concern both to the research community and the population, basically due to financial reasons and vaccination-related side effects. However, no one can dispute the contribution of vaccination to the reduction of epidemics. The aim of this study was to investigate the knowledge of healthcare professionals in a Mediterranean University Hospital in regards to adult vaccination and its safety. We also evaluated the proportion of health care professionals who have been vaccinated and the relation of vaccination rates to the level of education and type of work.

Methods: We prospectively conducted a survey in order to identify possible reasons for the adherence to the national recommendations for adults' vaccines among health care workers in western Greece.

Results: From a total number of 1080 Healthcare Workers, 384 were randomly selected and participated in our study. More than half of participants recognized the efficacy (58%) of vaccines. 63.7% of the responders have received the vaccines proposed by the National Vaccination Program for children and adults. Their main sources of information were printed materials (43.1%) and internet resources (29.1%). Several participants believed that vaccination can harm the health of the person being vaccinated (33.7%), and is generally unhelpful (24%). A significant proportion of the sample (20.7%) believed that vaccination is recommended because it serves pharmaceutical companies' interests, demonstrating a general mistrust against health care system. The limited amount of knowledge that health care professionals have about some types of vaccine (herpes zoster, diphtheria-tetanus vaccine every 10 years) has emerged, which is linked to their concern that vaccines can cause inactivation or can threaten their health.

Conclusion: A more intensive worldwide survey among health care professionals is warranted in order to depict health care professionals' thoughts and beliefs in regards to adult vaccines. Broadening and improving health care workers' knowledge regarding vaccination will reduce any anxiety, and will also probably increase their vaccination coverage.

Key words: *Vaccines; healthcare workers; vaccination safety*

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Received: 01 Mar 2021; Accepted: 09 Jun 2021

INTRODUCTION

The introduction of vaccinations improved global health dramatically, decreasing the spread of infectious diseases and their related consequences [1]. Furthermore, it is overall accepted that vaccination contributed worldwide in the reduction of pandemics [2]. The issue of vaccination, is however of great concern to both the

research community and the general population. Healthcare workers (HCWs) are at increased risk of contracting infections and further transmitting them to colleagues and patients [3]. Vaccinations of HCWs constitute a key measure of occupational medicine and infection control programs within healthcare facilities [4]. Although the vast majority of HCWs endorse vaccination, negative attitudes towards vaccination can be found among them as well. According to a recent systematic review, HCWs with lower confidence in the benefits and safety of vaccines are less willing to recommend vaccines to their patients and less likely to accept vaccinations for themselves [1]. Today a number of health care workers is sceptic towards vaccination, which results from both external factors (internet / media) and factors related to the human nature itself [5]. At the same time, research shows lack of knowledge among them in regards to vaccination and vaccines [6].

The aim of this study was to investigate the thoughts and beliefs of health care workers in the largest university hospital of western Greece regarding vaccination. Specifically, key points of the research were the investigation of the believed efficacy and necessity of vaccines, potential fear of side effects and the sources of information. In addition, we aimed to investigate the impact of participants' demographic characteristics (gender, age, type of work) on their views and attitudes towards vaccination.

PATIENTS AND METHODS

A cross-sectional study was conducted for a period of three months in 2019, among 384 randomly selected health care workers employed by the University Hospital of Patras, Greece. Study participants were selected by means of simple random sampling from the list of physicians, nurses, and other paramedical and nonmedical personnel (internal medicine, obstetrics, surgery, intensive care, pediatrics, microbiology department) and services (administrative and technical).

All participating HCWs completed a self-administered questionnaire that contained 33 questions regarding demographic characteristics (age, gender, level of education, field of work), their knowledge about the efficacy and safety of vaccination and specific vaccines for adults (Varicella Zoster Virus - VZV, Diphtheria-Tetanus-Pertussis – DTP, Pneumococcus - Pneumo, Hepatitis B - HepB, and Influenza vaccines) and beliefs regarding adverse effects of vaccines. The questionnaire was anonymous and the principles of research ethics were also implemented. The Ethics Committee of the University Hospital approved the study protocol.

DATA ANALYSIS

The SPSS was used for the statistical analysis of data obtained from the questionnaires. The statistical analysis included two levels. In the beginning, frequencies, mean values and standard deviations were calculated, in order to draw initial conclusions about participants' views on vaccination. Secondly, between group comparisons were performed to detect potential correlations between demographic characteristics and outcome measures. The following statistical criteria were used: the Pearson correlation, the t-test for 2 independent samples and the ANOVA test for more than 2 independent samples. Statistical significance was set at p=0.05.

RESULTS

Demographic characteristics

From the 384 enrolled participants, 67.5% were females and 32.5% were males. 65.1% were between 40-67 years old and 34.9% were between 20-40 years old. In regards to their educational level, 67.2% had higher educational level (university degree), 28.1% had middle educational level (high-school graduates) and 4.72% had received basic education. Most of the participants were nurses (46.4%), followed by paramedics (22.7%), administration workers (18,9%) and doctors (11.7%).

Participants' opinion regarding vaccines

In regards to vaccines' safety, 58% of the participants considered vaccines mostly not safe, while only 40.4% considered vaccines very safe. Interestingly, 6 of them (1.6%) considered vaccines totally not safe. Regarding vaccines' efficacy, 57.7% considered them very efficient, while 39.2% believed that vaccines are mostly effective. Only 1.6% considered vaccines mostly ineffective and 1.6% considered them totally ineffective. The high level of efficacy and safety attributed to vaccines seems to be in accordance with the level of acceptance of the participants towards the vaccines suggested by the Greek National Vaccination Program (NVP). A significant majority of participants (63.7%) had already been vaccinated according to the NVP while 31.1% had not.

The most frequent reasons for not being vaccinated were: "Negligence", followed by the "Fear of risks and side effects". 81.1% of participants believe that "vaccines are likely to cause side effects". When asked about the

time the side effects may occur, 72.8% of participants answered that side effects occur during the "first few days", followed by 18.2% stating "during the first 5 years", and 9% believing "after the first 5 years". A significant proportion of participants were skeptical towards vaccination, 33% believed that vaccines are not safe, 24% believed that they are unnecessary, while 20.7% believed that "vaccination serves pharmaceutical companies' interests".

43.1% of the participants obtained information about vaccines mostly from medical books/manuals, while 29.1% got information from internet resources and 18.3% drew information from social conducts. Concerning the necessity of vaccination for high and low-risk population, 66% of participants stated the need for vaccination even in the low-risk population and 91.3% answered that vaccination is extremely necessary for the group of high-risk patients, even those who had not been ill previously. When asked about which medical specialty is considered the most suitable to administer vaccines, 39.5% answered internal medicine specialist, 33.5% answered general practitioner and 26.8% answered a Health Care Visitor. 89.2% of the participants answered that the free administration of vaccines by the National Health System (NHS) will increase vaccination rates.

Participants' views on specific vaccine categories

Most of healthcare workers seem well-informed about the Influenza vaccine, followed by the Hepatitis B and the *Pneumococcus* vaccines. Specifically, 97.4% knew about the Influenza vaccine, 92.9% about the HepB vaccine and 86.9% about the Pneumo vaccine. Extremely few participants knew about the Dipheritis–Tetanus-Pertussi (DTP) and the Varicella Zoster Virus (VZV) vaccines (69.4% and 51.6% respectively). Concerning the source of information for each vaccine, medical staff (Internal Medicine Specialists, Infectious Diseases specialists) and media were the main sources of information.

Correlations

Further analysis showed statistically significant correlation between sex and beliefs regarding the complications of vaccinations proposed by the National Vaccination Program ($p = 0.000$). A significant correlation was also found between sex and skepticism regarding vaccination-related adverse effects, with 57,2% of females and 24.3% of males answering that vaccines are likely to cause side effects. Interestingly, we found a statistically significant difference between gender and the reasons for not being vaccinated. 25.4% of females answered that vaccines are not safe and 31.9% of males answered that vaccines are unnecessary. Gender differentiated participants' responses regarding the factors that may prevent vaccination ($x2 = 10,074$, $p = 0.018$). More precisely, women believe that vaccination can be dangerous to health and should therefore be avoided (25.37%), and men believe that it is useless (16.92%). Moreover, the correlation between the age and NVP completion showed that 38.2% of participants aged 40-67 years old had completed vaccination.

Statistically significant correlation was observed between the type of work and the implementation of all vaccines proposed by the National Vaccination Program. Specifically, it appeared that physicians (9.43%) and nurses (33.15%) had received these vaccines to a greater extent than other specialties in the sample. Doctors seemed to differentiate from the rest healthcare workers, believing that vaccines are safe and efficient. As for the most suitable specialty to administer vaccines, doctors supported the Internist (7.36%), while nurses preferred Health Care Visitor at a rate of 17.4%.

Finally, the type of work appeared to influence participants' responses to the information they have about specific vaccine categories. Particularly, both physicians and nurses were found to have higher levels of knowledge about the shingles vaccine than administrators, paramedics / others.

DISCUSSION

Health care providers is a special group of workers, exposed to several viruses. They belong to a population, who is more likely to get sick, and are at increased risk of transmitting diseases to patients whose health is already compromised [4]. To prevent this risk, it is necessary to carry out the vaccines proposed by National Vaccination Programs.

In our study vaccination rate was 63.7%. Our results are similar to the study by Maltezou et al, where approximately two thirds (63%) of the study group favored mandatory vaccinations for HCWs. Similar acceptance rates were noted in a German study but significantly higher in an Australian study (68.4% and 83%, respectively) [7].

Moreover, we reported that employees agree regarding the view that vaccines can bring positive results to a large extent (57.7%). A small proportion seemed

to have a negative attitude regarding vaccines safety and the vaccination process. This can be attributed to the increasing recognition of the importance of the condition of the patients over the years and to the further recommendation of adult vaccination by primary caregivers [8]. There are many factors that influence vaccination rates. In our study, we observed that vaccination rates were related to social and demographic characteristics of participants (age, gender, education, occupation). Women, were found to be highly vaccinated. This finding is in accordance to the existing literature, where it is recognized that the acceptance of vaccines by healthcare workers and their subsequent implementation depends on factors such as gender, age or the department in which they work [9].

On the other hand, the proportion of non-vaccinated personnel observed in this study raises the issue of a small yet significant percentage of individuals who despite the availability of effective prevention remain at great risk to get infected [10]. Immunization of HCWs has been associated with improvements in patient safety and decreased morbidity and mortality in hospitals and other health care facilities. Moreover, vaccination of HCWs can reduce workplace absences, deliver economic benefits for healthcare systems, and provide cost savings for healthcare organizations [11].

In many studies, the most common reasons for not vaccinating are the lack of suggestions for vaccination and the fear for serious complications [8]. In our study most of employees reported negligence as the main reason for non-vaccination. This is a finding that might reflect practical difficulties in obtaining access to vaccination services or a less cautious and responsible attitude of Greek health care workers towards their personal health and safety [10]. However, according to our study, healthcare workers were well-informed regarding the influenza vaccine compared to other vaccines, an observation which is compatible with findings of previous studies [12]. In our study, knowledge of influenza, hepatitis B and pneumonococcus was 97.4%, 92.7% and 86.9% respectively.

Vaccination implementation, moreover, is considered necessary for individual health, the improvement of quality of living and of course the promotion of public health [13]. This is a necessity recognized by health care professionals and as long as they work in the field of health-care they can promote both their own health and the health of people in their immediate environment [14,15].

Our study has some limitations. First limitation of the research concerns the limited time available. This time constraint also affected the sample, which, as already mentioned, is a sample of convenience and comes from employees in a single hospital, making it impossible to generalize the results to the population. In this study, it was observed that some of the questions were not answered, while there is no way for the researcher to control the degree to which the participants' answers are true or false.

Our study demonstrated that vaccines are generally accepted by people who work in a hospital, an acceptance that affects both their safety and efficacy. This seems to be consistent with the extent to which they have accepted the National Vaccination Program. This high degree of acceptance and vaccination may stem from the sense of responsibility that participants have, their respect for the patients with whom the participants meet every day, their desire to protect them from various diseases and perhaps their effort to set a "good example" for patients [16].

Another major finding is that a significant percentage of healthcare workers believe that vaccines are unnecessary. If voluntary vaccine uptake fails to achieve the desired rates, mandatory policies should be considered, provided that benefits outweigh harm for HCWs, patients' welfare is enhanced, and fair rules and exemptions are defined [17].

Nosocomial transmission of vaccine-preventable diseases can be avoided thanks to immunization. The ideal coverage is dynamic for each disease, depending on the effective reproductive rate, which itself varies with the level of contacts. Improving vaccine coverage among HCWs is challenging, but benefits patients who might face contagious HCWs as well as HCWs who provide care to contagious patients [18].

CONCLUSIONS

This cross-sectional epidemiological survey from a Mediterranean tertiary centre boosts already known facts from previous surveys, further highlighting the issue of vaccination of health-care professionals. The recognition of the efficacy and necessity of vaccines across almost all participants is noteworthy. We showed that although vaccines are widely recognized by health authorities and the medical community as a major tool for promoting public health, for many individuals (even for health care workers), this is not a sufficient basis. They doubt the benefits of vaccines, worry over their safety

and question their necessity, an attitude we refer to as vaccine hesitancy. The question that arises is what can happen especially to the general population who do not have special knowledge and experience. A similar survey should be conducted in the general population too.

Conflict of interest disclosure: *None to declare*

Declaration of funding sources: *None to declare*

Author Contributions: *ML, DV: conception and design of the study; KA, DV, MM, SF: analysis and interpretation of the data; ML, KT: drafting of the article; DV, SF: critical revision of the article for important intellectual content; MM: final approval of the article.*

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