

KNOWLEDGE, ATTITUDE AND PRACTICE AMONG THE STUDENTS OF SCHOOL OF MEDICINE OF UNIVERSITY OF MOSTAR TOWARDS INFLUENZA VACCINATION

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ABSTRACT

Introduction: Influenza is an acute, infectious disease of the human respiratory system, caused by influenza viruses. Since it is a vaccine - preventable disease, medical students as future health professionals should be involved in programs promoting the importance of flu vaccination.

Aim: Compare knowledge, attitude and practice of vaccination against influenza among students of the first and sixth year of School of Medicine of University of Mostar.

Subjects and methods: The study included a total of 81 students of the School of Medicine of the University of Mostar. The data were collected using a questionnaire that consists from demographic data of the respondents and twenty questions with the offered answers about the knowledge, attitude and practice of vaccination against influenza.

Results: Sixth - year students showed greater knowledge about contraindications for vaccination. Both groups of students showed mainly positive attitudes about influenza vaccination. No surveyed student was vaccinated against influenza and many of them reasoned that influenza is not a serious illness.

Conclusions: Despite good knowledge and mostly positive attitudes about influenza vaccination, no student who participated in the study was vaccinated against influenza. Therefore, it would be useful for medical students to provide additional information about the importance of illness prevention, because they represent an important part of the future workforce in the health system, that will affect the global attitudes of vaccination.

Keywords: influenza, vaccination, knowledge, practice, students

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INTRODUCTION

Flu (influenza) is an acute, infectious and contagious disease of the human respiratory system, caused by influenza viruses A, B and C. It is easily transmitted and spreads rapidly. It occurs in smaller and larger epidemics, and occasionally pandemic (1). There are three types of influenza virus: A, B, and C. Influenza A virus usually causes the most severe clinical picture. Influenza is spreading very fast and today, of all the classic infectious diseases, only it appears pandemic (2).

Influenza occurs epidemically almost every year. Since influenza is a serious disease, and for older people and chronic patients also fatal, and appears epidemiological and occasionally pandemic, public health and epidemiological measures for disease prevention and control are very important. Vaccination is the most effective way to prevent infection and serious complications caused by influenza viruses. It is recommended to be vaccinated every year, and it is especially useful for vulnerable groups of the population. The optimal time for vaccination is during October and November, but at-risk individuals can be vaccinated even after the onset of an influenza epidemic (3, 4).

Continuous change in the nature of influenza virus requires continuous global monitoring and frequent vaccine reformulation (5). Influenza vaccination reduces the incidence of serious forms of the disease, the number of hospitalizations, deaths, doctor visits, and absenteeism (3).

Healthcare workers are at high risk of contracting the influenza virus due to increased exposure to patients, and the risk further extends especially to vulnerable individuals (6). It is estimated that a quarter of healthcare workers have influenza infection in any given year, with a subsequent risk of transmission to colleagues and patients. During clinical practice, medical students are also at risk for influenza. Influenza vaccine intake by health professionals and medical students globally is low (7).

Physicians, health educators, and other health care workers are an integral part of raising community awareness, improving vaccination education, and developing campaigns to increase vaccine reception among the general population and other health care workers.

Many interventions, such as education, mobile immunization carts, vaccination champions, incentives, and required declination signature forms, have been demonstrated to improve vaccine

coverage; however, none alone or in combination have succeeded in achieving target coverage rates. Mandatory immunization policies in America, such as mandatory vaccination (all individuals must be vaccinated) and mandatory masking or vaccination (individuals must be vaccinated or wear a mask in patient-care areas), have achieved target vaccine rates and are supported by the Centers for Disease Control and Prevention (CDC) and multiple professional organizations such as the American Academy of Pediatrics and the Society for Healthcare Epidemiology of America. However, mandatory policies have been met with individual and organized resistance by healthcare providers and their unions (8).

Medical students as future health care professionals should be involved in programs to promote the importance of vaccination against influenza in the target groups and influence the current bad attitudes about vaccination, both among students who will in future carry the health care system and the impact on global attitudes about vaccination and in the wider community.

Therefore, it is crucial that students are well informed about the benefits and importance of vaccination, as this could be useful in creating more effective

educational materials and plans to increase vaccination against influenza, to break myths about the harmfulness of vaccination and point to its benefits.

AIM

The aim of this paper is to:

- Examine knowledge and attitudes on influenza vaccination among the students of School of Medicine of University of Mostar;
- Determine the level of influenza prevention in medical students;
- Compare knowledge and attitudes on influenza vaccination among first and sixth - year medical students and thus assess the level of awareness of the importance of vaccination at the beginning and end of studies;
- Encourage students to receive regular vaccination and to participate in programs to promote influenza vaccination.

SUBJECTS AND METHODS

Study design

This cross - sectional study was conducted at the School of Medicine of the University of Mostar, on 30st April, 2019. The respondents are first - and sixth - year students of the Medical Faculty of the

University of Mostar. The study included all students, eighty one of them, who were present at the faculty on the day of the examination and who had previously agreed to the survey. All students who did not want to participate in the survey and those who were not present at the faculty on the day of the examination were excluded from the survey.

Data collection

After the lecture, the survey questionnaire was distributed to the students by a neutral person (an employee of the faculty), who had nothing to do with the research. The research was conducted at the same time among the above groups of students. Survey data were obtained using a survey questionnaire. Our own questionnaire was compiled with a supplement from the questionnaire by Yu Ma, Tiegang Li, Wanqi Chen, Jiandong Chen, Meixia Li, Zhicong Yang, from the article “Knowledge, Attitudes and Practices (KAP) towards seasonal influenza vaccine among young workers in South China” (9). The survey questionnaire consists of two parts. The first part includes general demographic data (age, gender, place of residence and year of study). The second part of the questionnaire assesses the knowledge and

attitude about influenza vaccination and explores the practice of vaccination among students in these groups, and consists of twenty questions with offered answers. For each of the above questions, only one of the offered answers had to be circled. The survey questionnaire is completely anonymous and the information obtained was used only for the purpose of the research.

Statistical analyses

Frequency and percentage were used to display nominal variables. A chi-square test was used to analyze the nominal variables, and Fisher's exact test was used in the absence of the expected frequency. The possibility of error was accepted at $\alpha < 0.05$ and the differences between the groups were accepted as statistically significant for $p < 0.05$.

RESULTS

A total of 81 respondents participated in the research, 45 first-year students and 36 sixth-year students of the School of Medicine of the University of Mostar. In the first year, 13 men were interviewed, and in the sixth year, 11 men. The study involved 32 women in the first year and 25 women in the sixth year of study. There were no significant gender differences

between years of study. All respondents belonged to the age group in the range of 18-28 years.

Differences between knowledge, attitude and practice between student groups

Sixth - year students showed a significantly higher percentage (80.6 %) of knowledge about contraindications for vaccination ($\chi^2 = 18.243$, $p < 0.001$), compared to first-year students, of whom

33.3 % knew the correct answer (Table 1). First-year students mostly stated that the new influenza vaccine was quadrivalent (60.8 %) and thus gave the correct answer, which proved to be statistically significant compared to the answers of sixth-year students ($\chi^2 = 13,803$, $p = 0.002$). Only 30.6 % of sixth-year students opted for the same answer. There were no significant differences in the other variables shown in Table 1.

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Table 1. - Differences in knowledge and attitudes about influenza vaccine between first- and sixth-year students of the School of Medicine of the University of Mostar 1.

| | Year of study | | | | χ^2 | p |
|---|---------------|------|----|------|----------|---------|
| | 1 | | 6 | | | |
| | N | % | N | % | | |
| Influenza vaccine by composition is: | | | | | 0,227 | 0,634 |
| live attenuated | 21 | 46,7 | 14 | 38,9 | | |
| inactivated | 24 | 53,3 | 22 | 61,1 | | |
| The influenza vaccine can cause the following side effects | | | | | 3,359 | 0,352* |
| redness, swelling and pain at the application site | 2 | 4,4 | 3 | 8,3 | | |
| elevated body temperature (fever) | 8 | 17,8 | 4 | 11,1 | | |
| headache and muscle pain | 3 | 6,7 | 0 | 0,0 | | |
| all previous answers are correct | 32 | 71,1 | 29 | 80,6 | | |
| Should pregnant women be vaccinated against influenza? | | | | | 0,006 | 0,941 |
| Yes | 24 | 53,3 | 18 | 50,0 | | |
| No | 21 | 46,7 | 18 | 50,0 | | |
| What are the contraindications for influenza vaccination? | | | | | 18,243 | <0,001* |
| egg allergy | 2 | 4,4 | 0 | 0,0 | | |
| acute febrile conditions | 16 | 35,6 | 3 | 8,3 | | |
| severe side effect after previous administration of the vaccine | 12 | 26,7 | 4 | 11,1 | | |
| all previous answers are correct | 15 | 33,3 | 29 | 80,6 | | |
| The latest influenza vaccine is: | | | | | 13,803 | 0,002* |
| bivalent | 2 | 4,4 | 2 | 5,6 | | |
| trivalent | 9 | 20,0 | 12 | 33,3 | | |
| quadrivalent | 31 | 68,9 | 11 | 30,6 | | |
| pentavalent | 3 | 6,7 | 11 | 30,6 | | |
| What population group needs an influenza vaccine? | | | | | 1,931 | 0,886* |
| persons over 65 years of age | 1 | 2,2 | 0 | 0,0 | | |
| children (from 6 months to 5 years) | 1 | 2,2 | 1 | 2,8 | | |
| chronic patients | 2 | 4,4 | 1 | 2,8 | | |
| medical staff | 3 | 6,7 | 1 | 2,8 | | |
| all previous answers are correct | 38 | 84,4 | 33 | 91,7 | | |
| *Fisher's exact text | | | | | | |

Sixth - year students knew, in a significantly higher proportion, that influenza vaccination was recommended from October to December (66.7 %). This question was answered correctly by 46.7 % of first - year students (Table 2). A significant part of first-year students answered “I don't know” to this question (33.3 %). Thus, there is a statistically

significant difference between these groups of students in the knowledge of the time of year at which influenza vaccination is recommended ($\chi^2 = 11.773$, $p = 0.009$). In the other variables shown in Table 2, such as the attitude about the need for vaccination each year, the efficacy and safety of the vaccine, etc., there were no significant differences.

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Table 2. - Differences in knowledge and attitudes about the influenza vaccine between first- and sixth-year students of the School of Medicine of the University of Mostar 2.

| | Year of study | | | | χ^2 | p |
|---|---------------|------|----|------|----------|---------------|
| | 1 | | 6 | | | |
| | N | % | N | % | | |
| In which period of the year is vaccination against influenza recommended? | | | | | 11,773 | 0,009* |
| from January to March | 4 | 8,9 | 8 | 22,2 | | |
| from April to June | 3 | 6,7 | 0 | 0,0 | | |
| from July to September | 2 | 4,4 | 1 | 2,8 | | |
| from October to December | 21 | 46,7 | 24 | 66,7 | | |
| I do not know | 15 | 33,3 | 3 | 8,3 | | |
| Do you think that vaccination against influenza is required every year? | | | | | 0 | 1 |
| Yes | 31 | 68,9 | 25 | 69,4 | | |
| No | 14 | 31,1 | 11 | 30,6 | | |
| Are you worried you might get the flu? | | | | | 3,561 | 0,213* |
| Very worried | 0 | 0,0 | 3 | 8,3 | | |
| worried | 6 | 13,3 | 5 | 13,9 | | |
| I'm not worried | 39 | 86,7 | 28 | 77,8 | | |
| Have you ever heard of an influenza vaccine before? | | | | | 0,450 | 0,375* |
| Yes | 41 | 91,1 | 35 | 97,2 | | |
| No | 4 | 8,9 | 1 | 2,8 | | |
| Do you think that the flu vaccine can protect you from getting the disease? | | | | | 0,237 | 0,454* |
| Yes | 40 | 88,9 | 34 | 94,4 | | |
| No | 5 | 11,1 | 2 | 5,6 | | |
| To what extent do you think the influenza vaccine is safe? | | | | | 3,297 | 0,115* |
| it is safe and has no side effects | 3 | 6,7 | 6 | 16,7 | | |
| it is basically safe, but side effects are possible | 42 | 93,3 | 29 | 80,6 | | |
| it is not safe and has obvious side effects | 0 | 0,0 | 1 | 2,8 | | |
| Would you advise your family and friends to get vaccinated against influenza? | | | | | 0,088 | 0,767 |
| Yes | 30 | 66,7 | 26 | 72,2 | | |
| No | 15 | 33,3 | 10 | 27,8 | | |
| *Fisher's exact text | | | | | | |

Table 3 shows the practice of influenza vaccination among first- and sixth-year students of the School of Medicine of the

University of Mostar. The results show that no first- or sixth-year students received the influenza vaccine (n=0). As a reason for

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not being vaccinated, 22.2 % of first-year students and 19.4 % of sixth-year students chose the answer “I think that influenza is not a serious disease.” The largest number

of students from both groups decided to answer “other reasons”. There were no statistically significant differences in the other variables in this table.

Table 3. - Differences in the practice of influenza vaccination between first- and sixth-year students of the School of Medicine of the University of Mostar.

| | Year of study | | | | χ^2 | p |
|---|---------------|-------|----|-------|----------|--------|
| | 1 | | 6 | | | |
| | N | % | N | % | | |
| Have you been vaccinated against influenza in the past? | | | | | - | - |
| No | 45 | 100,0 | 36 | 100,0 | | |
| If the answer to question 14 is “no”, what are your reasons? | | | | | 2,185 | 0,756* |
| I don't think the flu is a serious illness | 10 | 22,2 | 7 | 19,4 | | |
| the vaccine is unsafe | 0 | 0,0 | 1 | 2,8 | | |
| limited effect of the vaccine | 5 | 11,1 | 2 | 5,6 | | |
| I don't know where I can get vaccinated | 3 | 6,7 | 2 | 5,6 | | |
| other reasons | 27 | 60,0 | 24 | 66,7 | | |
| Do you have any intention of vaccinating against influenza in the future? | | | | | 1,161 | 0,598* |
| Yes | 21 | 46,7 | 19 | 52,8 | | |
| No | 2 | 4,4 | 3 | 8,3 | | |
| Maybe | 22 | 48,9 | 14 | 38,9 | | |
| If your answer to the previous question is “no”, what are your reasons? | | | | | 1,234 | 1* |
| high costs | 0 | 0,0 | 1 | 33,3 | | |
| side effects and poor safety | 1 | 50,0 | 1 | 33,3 | | |
| other reasons | 1 | 50,0 | 1 | 33,3 | | |
| Do you think you belong to the population group that is recommended to be vaccinated against influenza? | | | | | 0,533 | 0,465 |
| Yes | 24 | 53,3 | 23 | 63,9 | | |
| No | 21 | 46,7 | 13 | 36,1 | | |
| Do you think it is necessary to introduce an obligation to vaccinate against influenza in BiH? | | | | | 0,016 | 0,898 |
| Yes | 27 | 60,0 | 23 | 63,9 | | |
| No | 18 | 40,0 | 13 | 36,1 | | |
| *Fisher's exact text | | | | | | |

DISCUSSION

This study compared the knowledge and attitude of first- and sixth-year students of the School of Medicine of the University of Mostar on influenza vaccination. Also, the rate of influenza vaccination was investigated in the same groups of students. The results of this study, which included a total of 81 students, showed that, in most questions, there was no significant difference in knowledge and attitudes about influenza vaccination between first- and final-year medical students. There is a significant difference in knowledge about contraindications to receiving the vaccine: one third of first-year students knew all the contraindications to vaccination, while most of sixth-year students answered this question correctly. Better knowledge on the time of year at which vaccination is recommended was also demonstrated by sixth-year students. Two thirds of them knew that vaccination was recommended in the period from October to December. The same question was answered correctly by half of first-year students. The results obtained coincide with the results of a survey among medical students in Spain, where it was found that clinical students have better knowledge of influenza vaccination than preclinical students (10).

When asked about the awareness of students that they belong to the population group for which influenza vaccination is recommended, almost half of first-year students and one third of sixth-year students answered positively. This coincides in part with a survey at the School of Medicine in Warsaw, where almost a half of students are aware of belonging to the group recommended for vaccination, and with a survey in Tehran, where the percentage is 39.8 %. A higher percentage of awareness of the need for influenza vaccination (77.9 %) was found among medical students in Strasbourg (11).

The results of this study showed that none of the surveyed students received the influenza vaccine, which differs significantly from many previous studies based on medical students (12-17). Most students cite the opinion that influenza is not a serious disease and other reasons as the reason why they have not been vaccinated in the past, while a smaller part of them do not know where they can be vaccinated. These results partially coincide with the results of a study in Frankfurt, where a quarter of unvaccinated students believe that influenza is not a serious disease (18). A small number of respondents believe that the vaccine is

unsafe or has a limited effect. This is in direct contrast to the information provided to students during their studies and the information provided by public health campaigns. They make it clear that an individual is not at risk of getting the disease from receiving an inactivated influenza vaccine and that the risk of serious side effects is very low in most individuals. Even with the abundance of information available in and out of the lecture halls, some respondents had misconceptions about the safety of vaccination. Vaccination is associated with a significant reduction in doctor visits, better school performance, and fewer days of absence from school or work. Thus, immunization provides the best preventive strategy against the influenza virus. Despite this, even the most effective vaccine is ineffective if people do not want to be vaccinated. Unfortunately, the public is distrustful of influenza vaccines. Multiple studies have shown that the motivation for refusing a new influenza vaccine is the fear of side effects. Many people also believe that vaccination will not be effective or that new vaccines have not been adequately tested and can be harmful and weaken the immune system. Others are not worried about influenza and simply do not want the vaccine (14, 19).

A study at the School of Medicine in Bari (Italy) showed that 20.9 % of medical students have ever received a vaccine (20). A study conducted in China on knowledge, attitudes and practice of influenza vaccination showed that the incidence among medical students is very low (less than 10%) and the main reasons for this were insufficient knowledge about the vaccine, fear of side effects and the belief that the vaccine is unnecessary (21). A similar survey among healthcare professionals in India found that only 4.4 % of them had ever received the flu vaccine, although most felt that influenza posed a potential danger to them or their environment. Some of the reasons were ignorance of vaccine availability, skepticism about efficacy, fear of side effects, belief that vaccination programs are profit-motivated, etc. (22). The results of my research have shown that more than 90 % of medical students in Mostar have a positive attitude about the effectiveness of vaccines in terms of disease protection and mostly consider the vaccine safe, which largely coincides with other studies (9, 13). However, students do not decide to receive the vaccine. A possible reason for a significantly lower rate of influenza vaccination among medical students in Mostar than for medical students in other

countries lies in the fact that regular influenza vaccination campaigns are routine in developed countries, while in Bosnia and Herzegovina such campaigns are mainly initiatives of certain doctors and some hospitals, not national policies and recommendations of most public health institutions. Although medical students should be informed about vaccination during their education, it cannot be presumed that they will have positive views and beliefs about the vaccine against seasonal flu. In addition, the study has shown that good knowledge of influenza and vaccination does not necessarily mean an increase in the vaccination practice itself. Views on the benefits and risks of vaccination, as well as misperceptions, can play an important role in the decision to receive the vaccinee. The results of this study indicate that it would be useful to provide additional information intended for medical students, with the aim of informing about the safety of vaccines, the importance of disease prevention and possible complications. Strengthening students' educational efforts seems crucial, as influencing attitudes at an earlier age can be simpler. Medical students represent an important part of the future workforce in the health care system, which can be an important factor in providing accurate and

clear health information, including training on the importance and benefits of vaccination, both for the individual and for the general community. Therefore, increasing the use of influenza vaccines in this population, informing and correcting false attitudes may be useful in creating more effective educational material and plans to increase the incidence against influenza, in order to break the vaccination myths.

It is important to take into account that the effectiveness of vaccines can play a role in the decision-making process of those who do not want to be vaccinated, which may be particularly pronounced among populations informed about the effectiveness of the vaccine, such as healthcare professionals. Further research is needed to determine whether the knowledge of the effectiveness of the vaccine influences the vaccination decision itself, in order to establish a more comprehensive understanding of why some do not want to be vaccinated.

CONCLUSIONS

Based on the results, it can be concluded that there is a statistically significant difference in knowledge about contraindications for receiving the vaccine and about the time of year at which

influenza vaccination is recommended, with sixth-year students showing greater knowledge compared to the first - year. First-year students are more likely to know that the latest influenza vaccine is quadrivalent, which has proven to be statistically significant. Both groups of students have positive attitudes about influenza vaccination. Despite good knowledge and mostly positive attitudes about vaccination, none of the surveyed students was vaccinated against influenza. Students should be provided with additional information on the importance of vaccination and included in programs to promote influenza vaccination in target groups.

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ZNANJE, STAV I PRAKSA CIJEPLJENJA PROTIV INFLUENCE MEĐU STUDENTIMA MEDICINSKOG FAKULTETA SVEUČILIŠTA U MOSTARU

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SAŽETAK

Uvod: Influenca je akutna, infektivna bolest dišnog sustava čovjeka uzrokovana virusima influence. Budući da se radi o cijepno-preventabilnoj bolesti, studenti medicine kao budući zdravstveni radnici trebali bi se uključiti u programe promicanja važnosti cijepjenja protiv influence.

Cilj: Usporediti znanje, stavove i praksu cijepjenja protiv influence među studentima prve I šeste godine Medicinskog fakulteta Sveučilišta u Mostaru.

Ispitanici i metode: Istraživanje je obuhvatilo ukupno 81 studenta Medicinskog fakulteta Sveučilišta u Mostaru. Podaci su prikupljeni pomoću upitnika. Prvi dio upitnika sadrži opće demografske podatke ispitanika, a drugi dio sadrži dvadeset pitanja s ponuđenim odgovorima o poznavanju, stavu i praksi cijepjenja protiv influence.

Rezultati: Studenti šeste godine pokazali su veće znanje o kontraindikacijama za cijepjenje. Obje skupine studenata pokazale su uglavnom pozitivne stavove o cijepjenju, Nijedan ispitanik učenik nije cijepjen protiv influence, a mnogi od njih obrazlažu da influence nije ozbiljna bolest.

Zaključak: Unatoč dobrom poznavanju i uglavnom pozitivnim stavovima o cijepjenju protiv influence, niti jedan student koji je sudjelovao u istraživanju nije bio cijepjen protiv iste. Stoga bi bilo korisno da se studenti medicine dodatno informiraju o važnosti prevencije bolesti jer oni predstavljaju važan dio buduće radne snage u zdravstvenom sustavu koja će utjecati na globalne stavove o cijepjenju.

Ključne riječi: influenza, cijepjenje, znanje, praksa, studenti

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