

DÔVODY NEOČKOVANIA ŠTUDENTOV MEDICÍNY PROTI CHRÍPKE A OCHORENIU COVID-19

INFLUENZA AND COVID-19 VACCINATION HESITANCY IN MEDICAL STUDENTS

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ABSTRACT

Background: SARS-CoV-2 and influenza coinfection can have an impact on morbidity, mortality, and health-service demand; therefore, health-care workers' vaccination against influenza is essential during the COVID-19 pandemic.

Aim: The aim of the study was to analyse the reasons for seasonal influenza and COVID-19 vaccination hesitancy in medical students.

Methods: A cross-sectional study was conducted in March 2021, just after the peak of the second wave of the COVID-19 pandemic in Slovakia. The study took place at all four Slovak medical faculties. An online questionnaire was created in Microsoft Forms. The reasons for non-vaccination were identified only in respondents who were not vaccinated with the appropriate vaccine (influenza, COVID-19).

Results: Of the 1,228 respondents, 141 (11.5 %) students were vaccinated against influenza, and 880 (71.7 %) students were vaccinated against COVID-19. Concerns about side effects were mentioned 6.7 times more often as a reason for not vaccinating with the COVID-19 vaccine (20.4 %) than with the influenza vaccine (3.0 %). Contrariwise, in the case of influenza, a lack of concern about influenza (11.9 %) / COVID-19 (2.0 %) was mentioned 5.9 times more often. No worries about getting influenza (39.8 %) / COVID-19 (10.9 %) was mentioned 3.7 times more often, as in the case of non-vaccination with the COVID-19 vaccine. Of 141 students vaccinated against influenza, 85.8 % were also vaccinated against COVID-19.

Conclusion: The promotion of vaccine uptake against COVID-19 and influenza is essential, especially in the current COVID-19 pandemic. Intensive education can increase interest in vaccination among medical students. Placing a greater emphasis on prevention seems essential in the medical curriculum.

Key words: Vaccination hesitancy. Influenza. COVID-19. Medical students.

ABSTRAKT

Východiská: Koinfekcia chrípkou a ochorením COVID-19 môže mať významný vplyv na chorobnosť, úmrtnosť a dopyt po zdravotných službách. Očkovanie proti chrípke je preto počas pandémie COVID-19 obzvlášť dôležité u zdravotníckych pracovníkov.

Ciele: Cieľom práce bolo analyzovať dôvody neočkovania študentov medicíny proti chrípke a ochoreniu COVID-19.

Metodika: Prierezová štúdia bola realizovaná v marci 2021, tesne po maxime druhej vlny pandémie na Slovensku. Štúdia prebiehala na všetkých štyroch slovenských lekárskech fakultách. Online dotazník bol vytvorený v Microsoft Forms. Dôvody neočkovania boli zisťované len u respondentov, ktorí neudali zaočkovanie príslušnou vakcínou (chrípka, COVID-19).

Výsledky: Z 1228 respondentov bolo zaočkovaných proti chrípke 141 (11,5 %) študentov, proti ochoreniu COVID-19

spolu 880 (71,7 %) študentov. Obavy z nežiaducich účinkov boli 6,7-krát častejším dôvodom neočkovania vakcínou proti COVID-19 (20,4 %) ako vakcínou proti chrípke (3,0 %). Naopak, ochorenie nepovažovali za vážne 5,9-krát častejšie neočkovaní proti chrípke (11,9%), ako neočkovaní proti COVID-19 (2,0 %). Pocit neohrozenia chrípkou (39,8 %) / ochorením COVID-19 (10,9 %) bol 3,7-krát častejší u neočkovaných proti chrípke ako u neočkovaných vakcínou COVID-19. Zo 141 študentov očkovaných proti chrípke bolo 121 (85,8 %) očkovaných proti COVID-19.

Záver: Podpora očkovania, či už proti chrípke alebo ochoreniu COVID-19 je v súčasnej situácii pandémie obzvlášť nevyhnutná. Intenzívne vzdelávanie môže zvýšiť záujem študentov medicíny o očkovanie. Ukazuje sa, že aj u študentov medicíny je potrebné dávať v obsahovej náplni štúdia väčší dôraz na prevenciu.

Ľúčové slová: Odmietanie očkovania. Chrípka. COVID-19. Študenti medicíny.

INTRODUCTION

Seasonal influenza significantly contributes to morbidity and mortality every year. Healthcare workers (HCWs) are indicated as a susceptible group to seasonal flu. Moreover, HCWs with influenza are a main source of infection for vulnerable patients, so they are encouraged to vaccinate every year before the winter outbreak of flu epidemic [1, 2]. Nevertheless, vaccination coverage in European HCWs is under 30% [3]. During the coronavirus disease pandemic, health-care personnel became more vulnerable to both influenza infection and COVID-19 disease. Therefore, influenza immunisation in high-risk groups was emphasised vigorously in hope of reducing the burden on the healthcare system [4, 5].

In March 2020 the World Health Organisation (WHO) declared COVID-19 a pandemic. The number of deaths and hospitalisations has been constantly increasing all over the world. So, the urgent development of effective vaccines was needed to return society to normalcy. At the end of 2020, scientists announced the possible registration and approval of such vaccines [6]. Despite the high efficacy of vaccines in combating the COVID-19 pan-

demic, there is a relatively large portion of the population hesitant towards coronavirus vaccines [7, 8]. Vaccine hesitancy is defined as a “delay in acceptance or refusal of safe vaccines availability of vaccine services” [9]. The hesitancy is mainly influenced by complacency, confidence, and convenience (access) [10].

Physicians are responsible for making recommendations for vaccination and providing guidance to vaccine-positive patients. Students of medicine play a key role in attitudes towards vaccination too [11, 12]. Understanding the attitudes of future physicians, COVID-19 vaccine hesitancy, and potential barriers towards seasonal influenza and COVID-19 vaccine uptake will enable public health authorities to understand the local scenario and devise further targeted action plans [2].

The aim of our study was to analyse the reasons for seasonal influenza and COVID-19 vaccination hesitancy in medical students.

METHODS

A cross-sectional study was conducted in March 2021, just after the peak of the second wave of the coronavirus pandemic in Slovakia. At the time of our study, the COVID-19 vaccine was available only for medical students in contact with patients. The study took place at all four Slovak medical faculties: Jessenius Faculty of Medicine in Martin; Faculty of Medicine of Comenius University in Bratislava; Faculty of Medicine, Pavol Jozef Safarik University in Kosice; and Faculty of Medicine, Slovak Medical University in Bratislava. General medicine students were included in the survey. We included the first and second years of study as preclinical students, and the other students (third to sixth year of study) were clinical students. This study was approved by the Ethics committee of the Martin University Hospital (no. EK UNM 38/2021).

An online questionnaire was available in Microsoft Forms and distributed through official university platforms on social media (e.g., Facebook). Out of 5,374 students of general medicine in Slovakia [13], 1,240 students filled in the questionnaire. Due to missing data, we excluded 12 respondents, so the final sample size was 1,228 students.

With the authors' consent, we used the questionnaire designed by Lucia et al. [11]. To avoid incompleteness and missing data, most of the questions were assigned as mandatory. The reasons for non-vaccination were identified only in respondents who

were not vaccinated with the appropriate vaccine (against influenza or COVID-19) and were described as a percentage from unvaccinated in appropriate group. Respondents could check more reasons for non-vaccination, and they could also add their own comment/reason for non-vaccination. Some open-answered reasons for non-vaccination were reclassified prior to analysis. In a previous study [14], we published information about attitudes towards vaccines and COVID-19 disease.

Acceptance of the COVID-19 vaccine was measured by a combination of two questions. The primary question was: "Are you vaccinated against COVID-19?" If the respondent received at least one dose of vaccine, we classified it as fully accepting vaccination. When the respondent was not vaccinated, we added the answer to the attitude question: "I could be vaccinated with the COVID-19 vaccine, which is approved in the EU." Respondents who disagreed with the statement were denoted as refusers of COVID-19 vaccination. Those who were not vaccinated and who agreed with the given statement were denoted as not yet vaccinated/hesitant.

The data were processed in Excel and Epi Info 7. The association between the categorical variables was evaluated by chi-square test of independence at the significance level of 0.05.

RESULTS

Of the 1,228 respondents (867 women; 70.6 %), the median age was 22 years (range 18 – 33 years). In the 2020/2021 season, 141 (11.5 %) students were vaccinated against influenza, and 880 (71.7 %) students were vaccinated against COVID-19 disease.

There were different reasons for non-vaccination against influenza and COVID-19 disease. In the case of influenza, reasons prevailed associated with indifference (carelessness) to the disease: “I do not feel that I am at risk for getting the flu” and “I have not used the vaccine before and never got the flu” were the most frequent. In the case of COVID-19, problems with the availability of vaccination and the recent overcoming of the disease predominate.

Concerns about side effects were mentioned 6.7 times more often as a reason for not vaccinating with the COVID-19 vaccine than with the influenza vaccine. Contrariwise, in the case of influenza, a lack of concern about influenza/COVID-19 was mentioned 5.9 times more often. No worries about getting influenza/COVID-19 was mentioned 3.7

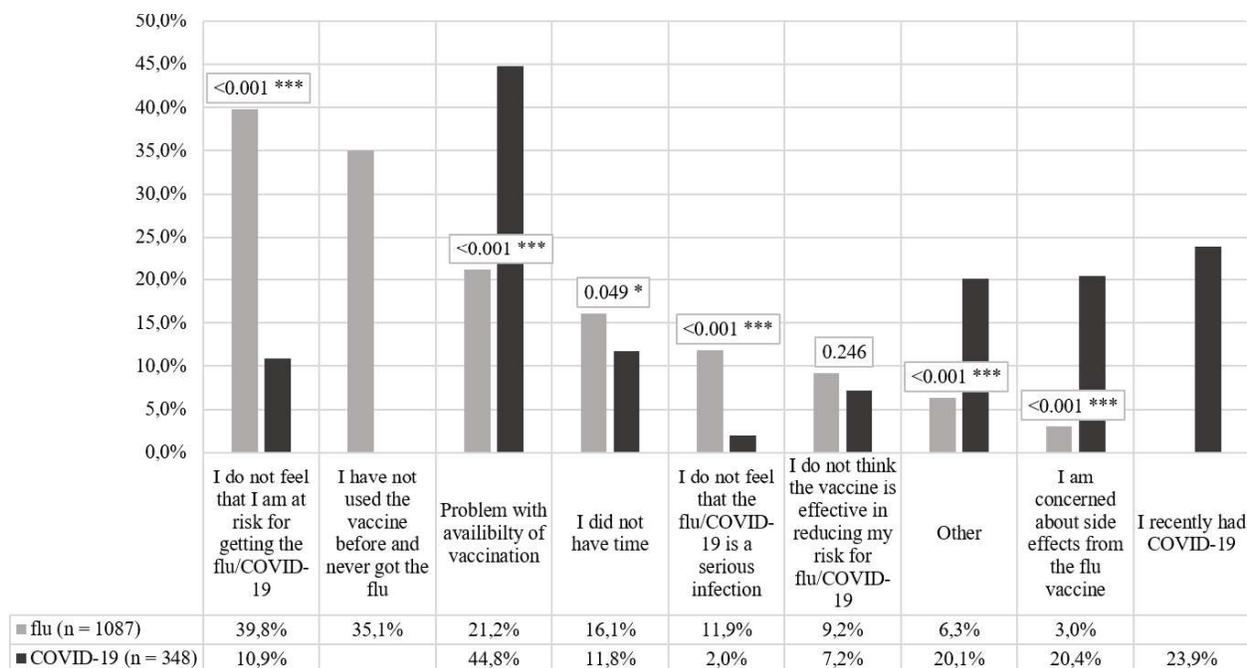


Figure 1 Reasons for non-vaccination against influenza and COVID-19

times more often, as in the case of non-vaccination with the COVID-19 vaccine (Fig. 1).

There was not any difference in influenza vaccination coverage between preclinical and clinical students: 398 (88.8 %) vs. 689 (88.3 %) were not vaccinated ($p = 0.789$). When comparing the reasons for non-vaccination against influenza, it was found that the option "I did not have time" as a reason for not vaccinating was more often mentioned by clinical students. On the contrary, "I do not feel that the flu is a serious infection" was more often mentioned by preclinical students. For the other options, the differences between preclinical and clinical students were not significant (Fig. 2A).

The difference in COVID-19 vaccination coverage between preclinical and clinical students was highly significant ($p < 0.001$): 249 (55.6 %) preclinical students and only 99 (12.6 %) clinical students were not vaccinated. Preclinical students more often indicated as the reason for non-vaccination the problem with availability of the vaccine, while clinical students reported more often overcoming the disease as the reason for not vaccinating (Fig. 2B).

Acceptance of vaccination against COVID-19 was strongly associated with the attended year of

study ($p < 0.0001$); the lowest vaccination rate was in the lower-year students. The proportion of unvaccinated/hesitant and refusing vaccinations was highest among preclinical students (Fig. 3).

Reasons for not vaccinating against COVID-19 were strongly associated with vaccination acceptance. For the refusers, the predominant reason for not vaccinating was the fear of side effects (up to 84%), as well as the lack of confidence in the effectiveness of the vaccine. In contrast, respondents not yet vaccinated/hesitant most often mentioned problems related to vaccine availability or that they had recently overcome the disease as a reason for non-vaccination (Fig. 4).

Vaccination against influenza and COVID-19 correlates ($p < 0.0001$): of 141 students vaccinated against influenza, 121 (85.8 %) were also vaccinated against COVID-19, and out of 1,087 students who were not vaccinated against influenza, 759 students (69.8 %) were vaccinated against COVID-19. We did not find any association between regular influenza vaccination in previous years and current COVID-19 vaccination (75.9 % vs. 71.2 %, $p = 0.303$).

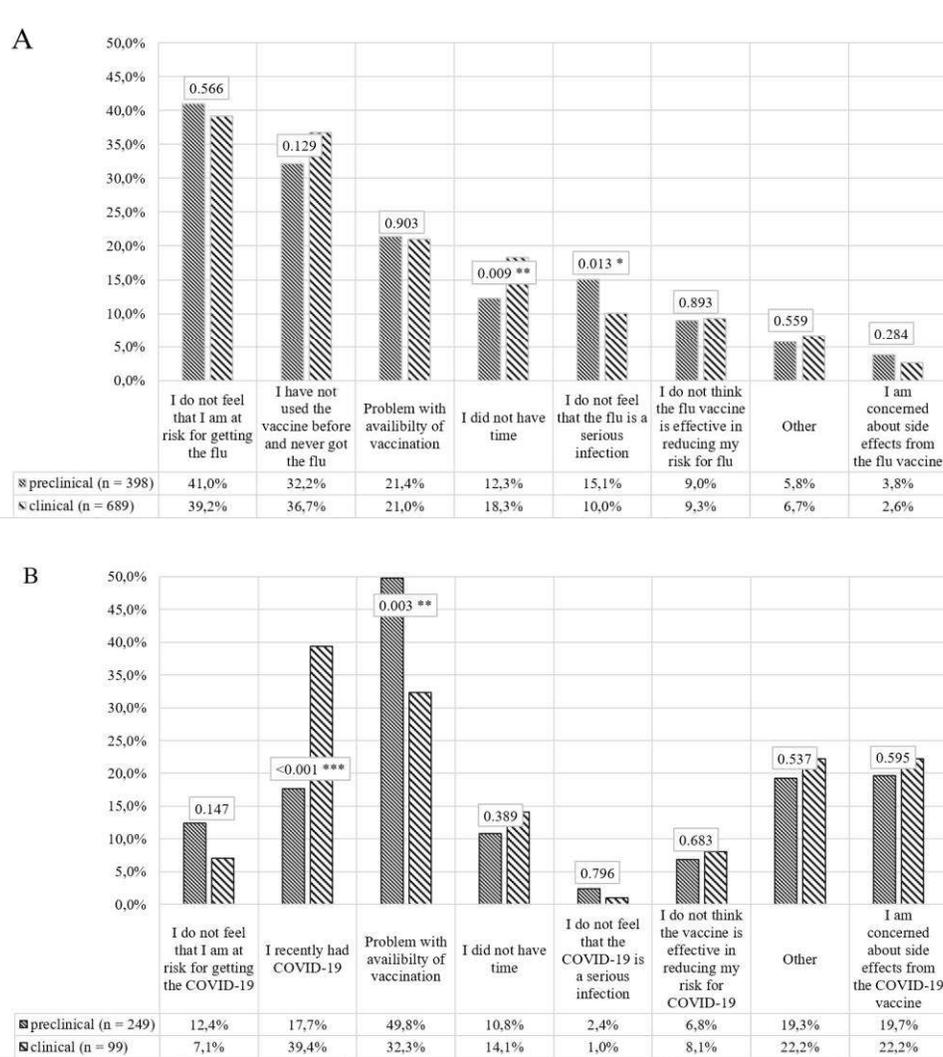


Figure 2 Reasons for not vaccinating against influenza (A) and COVID-19 (B) in preclinical and clinical students

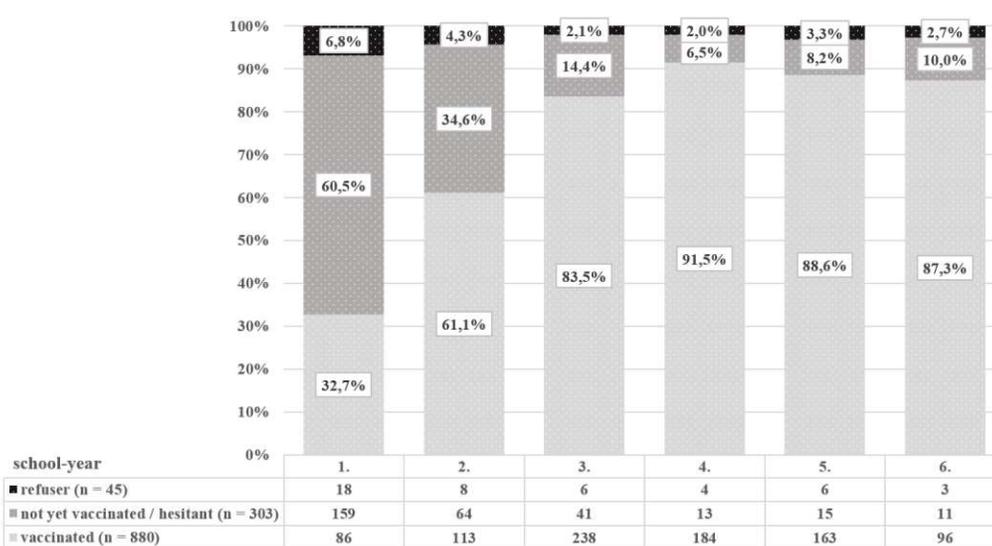


Figure 3 Acceptance of vaccination against COVID-19 according to the attended year of study

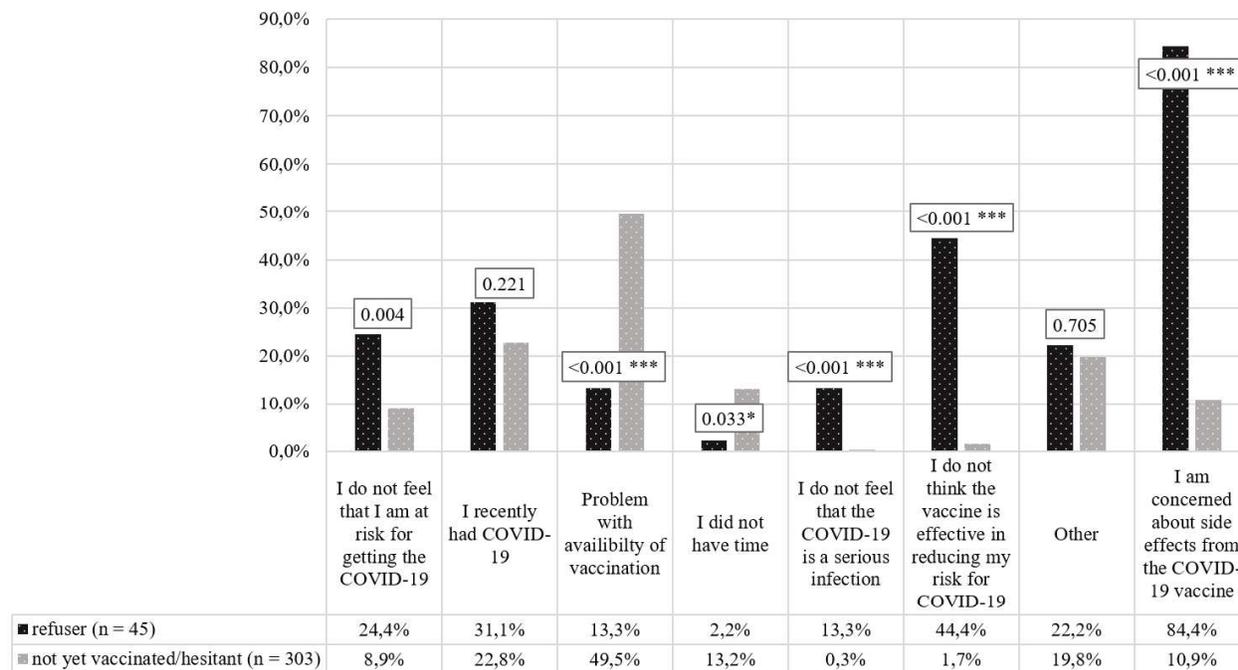


Figure 4 Reasons for not vaccinating against COVID-19 according to vaccination acceptance

DISCUSSION

We noticed in our sample a very low level of students (11.5 %) vaccinated against influenza independent of year of study. It reflects poor application of gained knowledge during medical studies in students' personal life. Similar results were demonstrated in an Italian study, where 12.0 % of respondents attending medical school were vaccinated [15]. Contrastingly, a Polish study reported a more than three times greater level of vaccinated medical students in comparison with ours [16].

Influenza has less serious complications and lower mortality than COVID-19 disease. Several studies on motivators of influenza vaccination among medical students reported low perception risk as a weak motivator for vaccination [17, 18]. This is in accordance with our results, because the respondents noted 3.6 times lower concerns (39.8 % vs. 10.9 %) about influenza in comparison with COVID-19 disease. Contrariwise, concerns about possible side effects of COVID-19 vaccination were 6.7 times greater (20.4 % vs. 3.0 %). The reason for risk perception can be explained by the fact that confidence and knowledge about the development and testing of influenza vaccines in society are much higher [19].

The results of Indian study [20] can be compared with our study, as they have used similar questionnaire in similar time horizon as we. Overall 82.3 %

of hesitant medical students in India are concerned about safety of vaccine, 28.3 % about efficacy of vaccine and more than 10 % think that they do not need vaccine because are young or are immune to the virus. The main reasons for not vaccination against COVID-19 are similar with our results in refusers of vaccine (see figure 4).

In the study among Italian dentists [21], their main reason for opposing vaccination was the lack of information (39 %), but the reasons "COVID-19 vaccine is unsafe" (37 %) and the fear of adverse events (35 %) were right on the second and the third place. Generally, the major concerns cited by students in healthcare professions are very similar to the concerns cited by practicing healthcare workers and professionals (e.g. concerns about safety, effectiveness, and side effects) [22]

Students in our study could also use a form of free answers to comment on reasons for non-vaccination. The most frequent reasons for not receiving flu vaccination were lack of concern, lack of interest, and lack of information about the vaccine. Surprisingly, students had a positive attitude towards COVID-19 vaccination. Preclinical respondents mentioned that they were not eligible for taking a vaccine because they were not in contact with patients. However, if there would be a possibility to take the vaccine, they would vaccinate. Some students stated that they want to leave their vaccine for

vulnerable groups. Unreliability, an insufficiently short time for clinical trials, and lack of information were less frequent reasons for not receiving a COVID-19 vaccine. In the study among dental and medical students [23] the comments in open questions reflected concerns about vaccine safety and efficacy, rapid development and implementation, trust in regulatory agencies, politicization, and resources and education for the public.

Although some studies reported higher acceptance of flu vaccination among clinical students [24, 25], our results did not agree. The clinical years of medical study are considered as a significant factor of pro-vaccination attitude [26]. The curriculum of students attending the first and second years of study focuses on the level of theoretical knowledge. It can explain the fact that preclinical students answered "I don't think the flu is a serious disease" more often (15.1 % vs. 10.0 %) than clinical students. Moreover, the absence of clinical practice in students attending the first and second years of medical study could also have a significant impact on the answers related to COVID-19 vaccine hesitancy. It can reflect the fact that 49.8 % of preclinical medical students reported vaccine availability as a reason for non-vaccination. Similar to other countries, healthcare workers were among the first to be vaccinated [27]. According to the Slovak COVID-19 vaccination strategy, only medical students in contact with patients during their clinical teaching or working as a volunteer in COVID-19 sampling sites can receive the vaccine, which means students after their second year of study.

The average COVID-19 vaccination rate in our study was 71.7 %. It is lower than the COVID-19 vaccination rate obtained in a Czech study (80.0%) [28]. On the other hand, our findings, as in other studies [28, 29], confirmed a significant impact of the attended year of study on the vaccination rate. Moreover, the analysis showed that flu vaccination in the prior season correlates with COVID-19 vaccination (85.8 % vs. 69.8 %). This is in accordance with an American study, which found that 81.4% of respondents vaccinated against influenza have a positive attitude toward COVID-19 vaccination [30]. However, the interpretation of differences in acceptability of COVID-19 and flu vaccines is still under debate. The positive attitude toward COVID-19 vaccination by respondents vaccinated against flu can be influenced by a less serious risk perception thanks to previous positive vaccination-related

experience [26]. Secondly, at the beginning of the COVID-19 pandemic, no effective vaccine was available. So, experts recommended influenza vaccination to reduce the number of individuals infected by COVID-19 and possible negative health effects [31].

Due to the ongoing COVID-19 pandemic, medical students having a medical training at hospitals are at higher risk of acquiring viral infections. Therefore, the low willingness to vaccinate could become the biggest public health threat [2]. The government, health department, and universities need to work together and actively communicate with vaccine-hesitant students, establish a standardized COVID-19 vaccine course, and provide vaccination services on campus [32].

CONCLUSIONS

The promotion of vaccine uptake against COVID-19 and seasonal influenza is essential, especially in the current COVID-19 pandemic. Vaccinated students who have a positive attitude towards vaccines and share their vaccination experiences with patients can support vaccine intake. There is thus a need to investigate the overall attitudes towards COVID-19 vaccination in medical students to plan an effective vaccination strategy for healthcare workers and patient protection. Placing greater emphasis on prevention and finding an effective way to transform gained knowledge into practice seem essential in the medical curriculum. Trustworthy, scientifically based information thus can prevent misinformation that would encourage hesitation or vaccine resistance.

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