

Future doctors: Do they know more about influenza after the pandemic?

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ABSTRACT: Influenza is a universal but greatly preventable disease with vast consequences due to its yearly epidemics and sporadic pandemics. Therefore it is important to estimate the theoretical and practical skills of future doctors concerning influenza.

The study aims the evaluation of the knowledge level of graduating students of Medicine about influenza before and during the recent A(H1N1) pandemic and intends to indicate any change observed.

A total of 224 students attending the last year of Medical School in the beginnings of 2009 and 2010, answered anonymous questionnaires concerning viral and clinical aspects of influenza, sources of information and self-awareness. The two periods' data were analyzed and compared in order to estimate the role of the pandemic in students' knowledge level.

The students generally seem to have sufficient theoretical and practical knowledge about influenza. Their knowledge level appears somehow affected in 2010, presenting either amelioration or confusion due to the particularities of the pandemic. The media have had an important contribution to the students' information about influenza during the pandemic.

It might be useful the basic medical education to be revised during the whole duration of medical studies, so that future doctors continuously renovate and complete their knowledge by proper sources.

Key Words: Students, Medicine, Knowledge, Influenza, Pandemic, Media.

INTRODUCTION

Influenza is a common contagious disease caused by influenza virus, an RNA virus, member of the family of orthomyxoviruses, distinguished into three types, A, B and C. There are two main viral antigens, haemagglutinin (H) and neuraminidase (N), the combinations of which create a variety of subtypes infecting fowl, humans and other mammals. Mutations and genetic recombination events may lead to antigenic drifts and shifts which may cause annual epidemics and occasionally pandemics respectively¹.

Influenza viruses infect through contaminated droplets and the most common clinical features include abrupt onset, fever >38°C, cough, photophobia, headache, myalgia and malaise, symptoms that may characterize other influenza-like illnesses (ILI)

as well. Diarrhoea and vomiting are rarely present, mostly in children, apart from the 2009 A(H1N1) pandemic when gastrointestinal symptoms were observed in adults as well. A variety of clinical manifestations, serious or not, may also occur extending from a mild common cold clinical picture to severe pneumonia or ARDS. Influenza may sometimes be lethal due to the original infection or to secondary complications¹.

Influenza prevention consists of crowd avoidance, personal hygiene, mainly hand washing, and vaccination of high risk population groups or of the general population in case of a pandemic, by whole attenuated, inactivated, split or subunit virus vaccines¹.

Apart from symptomatic treatment, specific antiviral compounds are used, such as the older amantadine and rimantadine, which do not target influenza B virus

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and are not effective against the pandemic A(H1N1) virus either, due to its resistance to adamantanes. Most commonly used are the neuraminidase inhibitors, zanamivir and oseltamivir, effective to most known influenza viruses until now^{1,2}.

In March-April 2009 a novel flu strain emerged in Mexico, the United States, characterized by a combination of genes from human, pig and bird influenza viruses and initially known as “swine flu” or later on as “novel influenza” virus or “A(H1N1)v”. After its global expansion in the following short period of time, the World Health Organization officially declared the outbreak to be a pandemic on June 11th, 2009².

The fact that influenza is a universal disease, which affects all groups of people with vast consequences to the community and, furthermore, the fact that this is to a great extent a preventable situation, motivated this study. The target was a) to estimate the level of knowledge and adequacy among the undergraduate students of medicine of the Aristotle University of Thessaloniki about influenza and b) to compare this knowledge before and after the pandemic outburst. This attempt aimed not only their final efficacy as future doctors but also their theoretical background as well as the sources of their information. Furthermore, an evaluation of the students’ self-awareness about their proficiency in influenza was attempted.

MATERIALS AND METHODS

All participants in this research were attending the last year of studies at the School of Medicine of the Aristotle University of Thessaloniki, the most numerous, in terms of registered students, Medical School in Greece. The first part of the research was performed in the beginning of 2009, before the outburst of the A(H1N1) pandemic, and the participants were 107 (27.4%) of the 390 graduating students (59 males and 48 females). The second part of the research took place in the beginning of 2009, during the pandemic, and the participants were 117 (30.5%) of the 383 graduating students (58 males, 59 females).

To all participating students, a personal and anonymous questionnaire was distributed, referring to knowledge about influenza obtained during the former years of medical studies. In the first research the questionnaire consisted of 20 multiple choice or short answer questions about influenza, divided in 4

sections: a) self-awareness (1 question), b) viral and epidemiological features (7 questions), c) clinical features (4 questions) and d) treatment and prevention (8 questions). In the second research, the questionnaire contained one more question regarding the source of the participating students’ information.

In both cases, data was processed with a statistical analysis by SPSS programme (version 11.0) using χ^2 test; p value was 0.05. There was also data processing of the self awareness question, in order to define the level of subjective awareness of knowledge. Each participant’s proficiency was evaluated in the 19 knowledge questions. The results were then compared to the answer of each student to the self-awareness question, which included four options: not informed, little, enough and well informed. Based on whether the objective score and the subjective opinion of a participant belonged to corresponding categories, the level of the objective self-awareness of our students was estimated.

RESULTS

The results of the whole two period research are presented (Table 1).

In the 2009 research, 104 (97.2%) of the 107 questioned medical students were aware of the viral cause of influenza. In 2010, 113 (96.6%) of the 117 participants answered correctly to the same question ($p = 0.7916$).

The antigenic constitution of the virus was known to 32 (29.9%) of the students in 2009 and to 70 (59.8%) of the students in 2010 ($p = 0.0000$).

In 2009, 83 (77.6%) medical students were aware of the fact that influenza also affects other animal species apart from man, such as birds, swine and horses, and in the 2010 research 86 (73.5%) of the students answered the question correctly ($p = 0.4801$).

Sixty (56.1%) students were able to justify the occurrence of influenza epidemics and pandemics, whereas correct answers were given by 47 participants (40.2%) in 2010 ($p = 0.0173$).

Aware of the peak of influenza period in the northern hemisphere during winter were 69 (64.5%) students in 2009 and 83 (70.9%) in 2010 ($p = 0.2015$).

The possible fatality of influenza was known by 98 (91.6%) students in 2009, and by 102 (87.2%) in the 2010 research ($p = 0.2865$).

Table 1. Total results of the 2009 and 2010 questionnaires, corresponding to the pre-pandemic and pandemic period respectively.

Questions	Correct answers		Incorrect answers		No answer		
	2009 no. %	2010 no. %	2009 no. %	2010 no. %	2009 no. %	2010 no. %	
1. Viral cause of influenza	104 (97.2%)*	113 (96.6%)*	3 (2.8%)	3 (2.6%)	0 (0%)	1 (0.9%)	
2. Antigenic constitution of virus	32 (29.9%)*	70 (59.8%)*	15 (14%)	14 (12%)	60 (56.1%)	33 (28.2%)	
3. Animal species affected	83 (77.6%)*	86 (73.5%)*	12 (11.2%)	11 (9.4%)	12 (11.2%)	20 (17.1%)	
4. Peak period in the northern hemisphere	69 (64.5%)*	83 (70.9%)*	35 (32.7)	21 (17.9%)	3 (2.8%)	13 (11.1%)	
5. Fatality of influenza	98 (91.6%)*	102 (87.2%)*	9 (8.4%)	15 (12.8%)	0 (0%)	0 (0%)	
6. Way of infection	106 (99.1%)*	110 (94%)*	1 (0.9%)	6 (5.1%)	0 (0%)	1 (0.9%)	
7.A. Systems affected	51 (47.7%)*	22 (18.8%)*	54 (50.5%)*	93 (79.5%)*	2 (1.8%)	2 (1.8%)	
7.B. Symptoms	72 (67.3%)*	83 (71%)*	33 (30.8%)*	28 (23.9%)*	2 (1.8%)	6 (5.1%)	
8. "ILI" - "influenza": difference between terms	45 (42%)*	56 (47.9%)*	11 (10.3%)*	15 (12.8%)*	51 (47.7%)*	46 (39.3%)*	
9. Relation between age and frequency of contamination	26 (24.3%)*	38 (32.5%)*	81 (75.7%)*	79 (67.5%)*	0 (0%)*	0 (0%)*	
10. Relation between age and severity of clinical features	Epidemics	93 (86.9%)*	44 (37.6%)*	13 (12.1%)*	45 (38.5%)*	1 (0.9%)*	28 (23.9%)*
	Pandemic	-	35 (29.9%)*	-	80 (68.4%)*	-	15 (12.8%)*
11. Reason for influenza epidemics and pandemics	60 (56.1%)*	47 (40.2%)*	26 (33.6%)*	37 (31.6%)*	11 (10.3%)*	33 (28.2%)*	
12. Anti-influenza compounds	43 (40.2%)*	87 (74.4%)*	16 (15%)*	6 (5.1%)*	48 (44.8%)*	24 (20.5%)*	
13. Control and prevention	80 (74.8%)*	111 (94.9%)*	27 (25.2%)*	0 (0%)*	0 (0%)*	6 (5.1%)*	
14. Do we use antibiotics against influenza?	91 (85.1%)*	97 (83%)*	15 (14.8%)*	16 (13.7%)*	1 (0.9%)*	4 (3.3%)*	
15. Ideal season for influenza vaccination	78 (72.2%)*	84 (71.8%)*	17 (15.9%)*	23 (19.7%)*	12 (11.2%)*	10 (8.5%)*	
16. Consistence of influenza vaccine used in Greece	42 (39.3%)*	71 (60.7%)*	17 (15.9%)*	43 (36.8%)*	12 (11.2%)*	3 (2.5%)*	
17. Why vaccination has to be repeated every year?	66 (61.7%)*	76 (65%)*	22 (20.5%)*	32 (27.3%)*	19 (17.8%)*	9 (7.7%)*	
18. Vaccination recommended	Epidemics	87 (81.3%)*	79 (67.5%)*	19 (17.8%)*	34 (29.1%)*	1 (0.9%)*	4 (3.4%)*
	Pandemic	-	82 (70.1%)*	-	20 (17.1%)*	-	15 (18.2%)*
19. No vaccination recommended	Epidemics	73 (68.2%)*	70 (59.8%)*	23 (21.5%)*	30 (25.6%)*	11 (10.3%)*	17 (14.5%)*
	Pandemic	-	57 (48.7%)*	-	23 (19.6%)*	-	37 (31.6%)*

* Results presenting statistically significant differences ($p < 0.05$) are marked.

The droplet transmission of influenza was known by all but one (99.1%) in 2009 and by 110 students (94%) in 2010 ($p = 0.0420$).

Regarding the systems affected by influenza viruses, correct answers were given by 51 students (47.7%) in 2009 but only by 22 of the students (18.8%) in 2010 ($p = 0.0000$). In the two parts of the research the respiratory system was mentioned by 103 (96.3%) and 111 (94.9%) students ($p = 0.6149$), the gastrointestinal one by 45 (42.1%) and 22 (18.8%) students ($p = 0.0000$), the circulatory system by 14 (13.1%) and 23 (19.7%) students ($p = 0.1857$), the nervous system by 25 (23.4%) and 25 (21.4%) students ($p = 0.7200$) and the musculoskeletal by 10 (9.3%) and 8 (6.8%) students ($p = 0.4903$) in 2009 and 2010 respectively. In 2009 the immune system was also considered to be affected by influenza viruses by 3 (2.8%) students. There seems to be a statistically significant deterioration of the knowledge about the gastrointestinal participation to influenza symptomatology, between 2009 and 2010.

Seventy two (67.3%) students in 2009 and 83 (71%) in 2010 ($p = 0.5544$) were able to identify the proper symptom-combination of a suspicious for influenza infection patient, which includes fever >38 , headache, myalgia, cough and diarrhoea mostly in children.

The fact that “influenza” and “influenza-like-syndromes” are not identical terms, was known by 45 (42%) and by 56 (47.9%) participants in the 2009 and the 2010 research respectively ($p = 0.3829$).

Referring to the relation between the age and the frequency of contamination by influenza viruses, in 2009, 26 (24.3%) correctly indicated children, 3 (2.8%) adults, 20 (18.7%) overaged individuals, while 57 (53.3%) believed that children and overaged are similarly affected. In 2010, 38 (32.5%) of the participants answered correctly, considering children as the mostly infected ($p = 0.1759$), 20 (17.1%) indicated adults (deterioration, $p = 0.0004$), 15 (12.8%) overaged individuals ($p = 0.2267$), while 44 (37.6%) believe that children and overaged get contaminated at the same frequency (amelioration, $p = 0.0186$).

To the question about the relation between age and morbidity, in 2009 the elderly were correctly suggested by 83 (77.6%). In 2010, referring to the seasonal

influenza, children were indicated by 12 (10.3%) of the participants, adults by 17 (14.5%), overaged were indicated by only 29 (24.8%, $p = 0.0000$), while 31 (26.5%) students suggested that children and overaged present equal morbidity of influenza. Regarding the pandemic influenza, children were suggested by 21 students (17.9%), adults by 35 (29.9%), overaged by 30 (25.6%), 29 participants (24.8%) believed that both children and overaged present similar morbidity. The participants in 2010 appear to have better knowledge about the high morbidity among adults during the pandemic influenza ($p = 0.0000$ and 0.0046 comparing to 2009 and 2010 knowledge about seasonal influenza respectively).

In 2009, 43 students (40.2%) were able to mention at least one anti-influenza compound. The compounds mainly suggested were amantadine by 37 (34.6%) and rimantadine by 18 (16.8%) of the students. In 2010, 87 (74.4%) were able to mention at least one drug. The compound mostly known was oseltamivir, mentioned by 69 (59%) students. There was a statistically significant difference between the answers of 2009 and 2010, indicating that the participants in 2010 had better knowledge of the anti-influenza compounds ($p = 0.0000$).

The fact that antibiotics are not effective against influenza, unless prescribed for secondary infections, was known by 91 participants (85.1%) in the 2009 research and also by 97 participants (83%) in the 2010 research ($p = 0.6630$).

Referring to infection control and protection from the virus, the ways mostly suggested by the participants in 2009 were vaccination by 57 (53.3%), crowd avoidance by 46 (43%), and proper hand washing by 28 (26.2%). In 2010 only 24 (20.5%) of the students mentioned vaccination ($p = 0.0000$), 53 (45.3%) suggested crowd avoidance ($p = 0.7282$), 52 (44.4%) proper hand washing ($p = 0.0044$), and 25 (21.4%) use of masks and gloves (Figure 1).

The ideal season for anti-influenza vaccination, about two months before a predictable outbreak, was correctly identified by 78 (72.9%) students in 2009 and by 84 (71.8%) in 2010 ($p = 0.8539$).

The exact consistence of the influenza vaccine used in Greece (subunit vaccines) was known by only 42 (39.3%) participants in the pre-pandemic period,

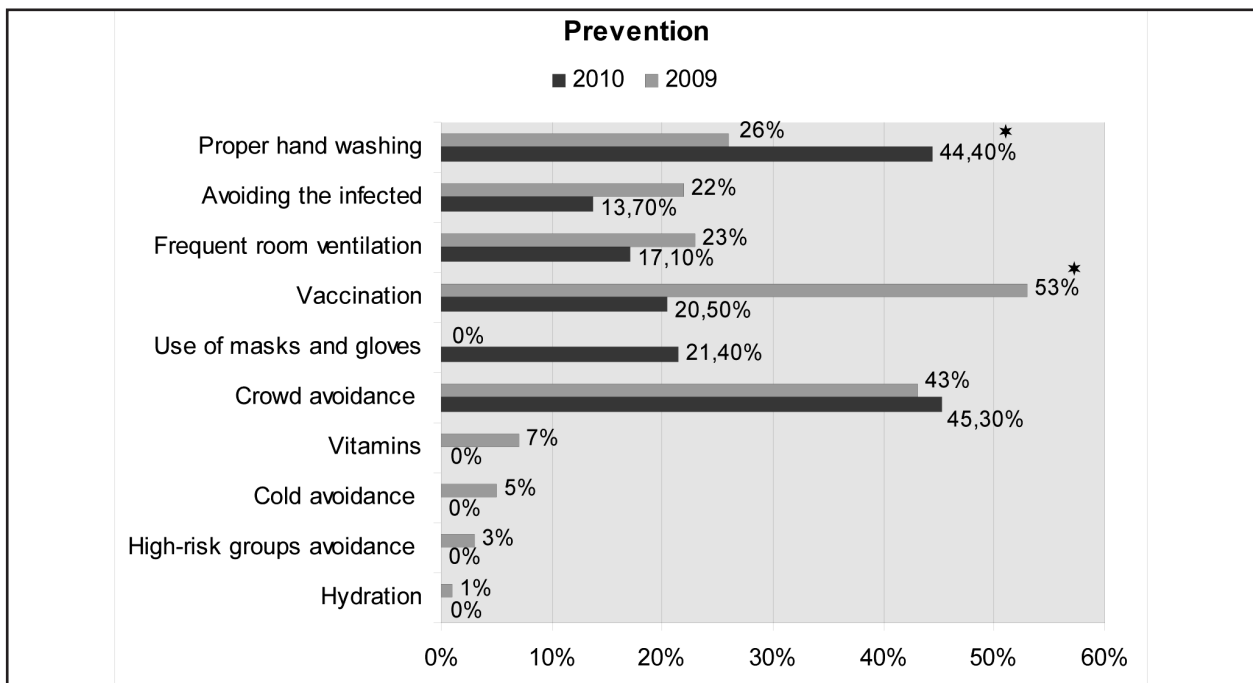


Figure 1. Suggested ways for the prevention of influenza transmission.

whereas by 71 (60.7%) participants in 2010. It appears that the participants of the 2010 research were better informed about the consistence of influenza vaccines ($p = 0.0000$).

In addition, 66 (61.7%) of the participants in 2009 were aware of the fact that the high mutation rate of influenza viruses is the reason that the vaccination has to be repeated every year when the vaccine strains are updated. In 2010, 76 (65%) of the students answered correctly to the same question ($p = 0.6113$).

Ultimately the students answered about groups for which vaccination is recommended. In 2009, 100 (93.5%) participants correctly indicated overaged people, 90 (84.1%) sanitary personnel, 65 (60.7%) people having a heart disease and 49 (45.8%) diabetics. Pregnant women were also mentioned by 20 students (18.7%). In 2010, our participants were asked to separately suggest which groups should be vaccinated during a seasonal outbreak or a pandemic of influenza. 103 (88%) and 78 (66.7%) of the students would correctly vaccinate overaged people, 75 (64.1%) and 81 (69.2%) sanitary personnel, 73 (62.4%) and 72 (61.5%) people with heart diseases, 69 (59%) and 67 (57.3%) diabetics, 46 (39.3%) and 67 (57.3%) preg-

nant women, respectively (Figure 2). Comparing the students' knowledge about seasonal influenza outbreaks in 2009 and 2010, statistically significant difference was found for sanitary personnel and pregnant women (both $p = 0.0007$), $p = 0.0484$ for diabetics, while $p = 0.1642$ and 0.9035 for overaged and heart patients respectively.

On the other hand, i.e. which groups should not be vaccinated, the answers gathered in 2009 were mainly allergic to eggs by 75 participants (70%) and pregnant women by 54 (50.5%). In the 2010 research the question was divided into two parts, referring to seasonal or pandemic influenza. Thus, allergic to eggs would not be vaccinated by 82 (70.1%, $p = 0.9990$) and 72 (61.5%, $p = 0.1781$) of the students, pregnant women by 28 (23.9%, $p = 0.0000$) and 16 (13.7%, $p = 0.0000$), people who suffer from neurodegenerative syndromes by 33 (28.2%) and 29 (24.8%), respectively. None of the students would discourage the vaccination of sanitary personnel. (Figure 3)

Referring to the self-awareness of the students, in both periods of our research, 2009 and 2010, most of the participating students considered themselves informed enough about influenza, i.e. 60 (56.1%)

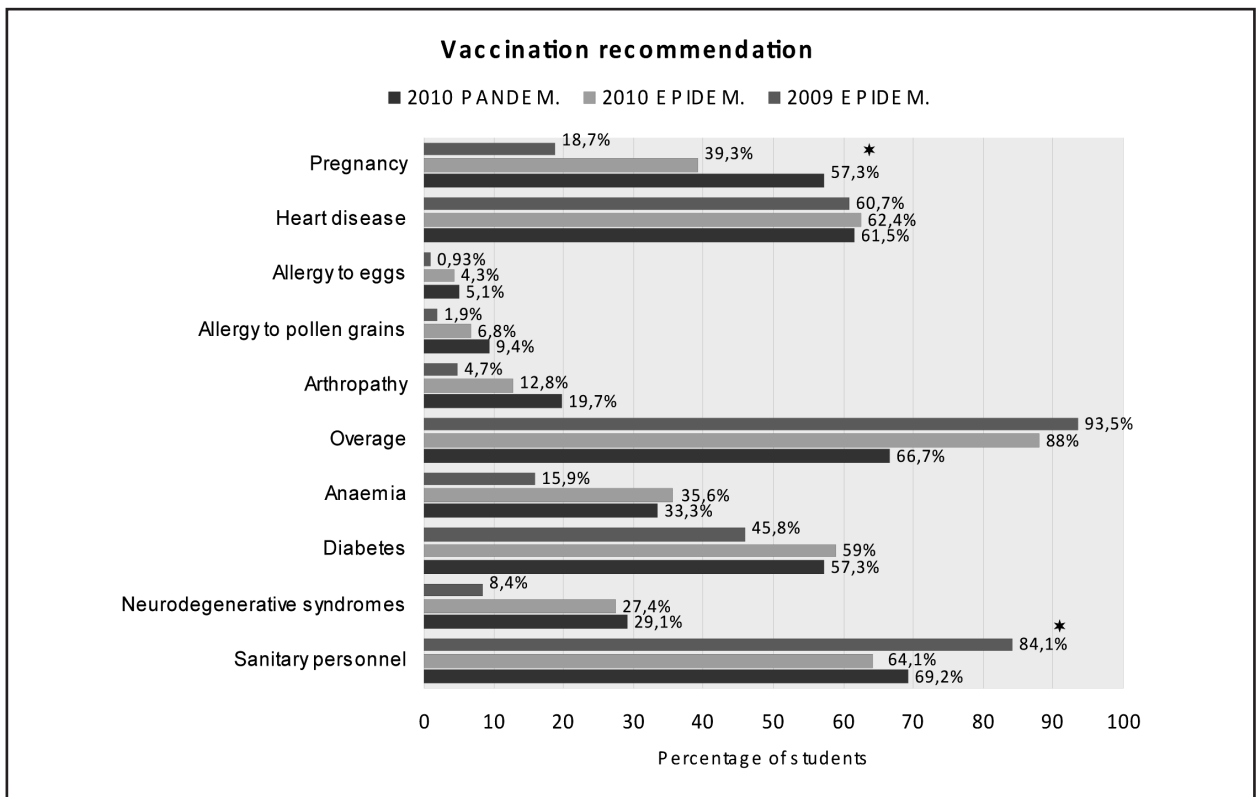


Figure 2. Population groups to whom vaccination is recommended.

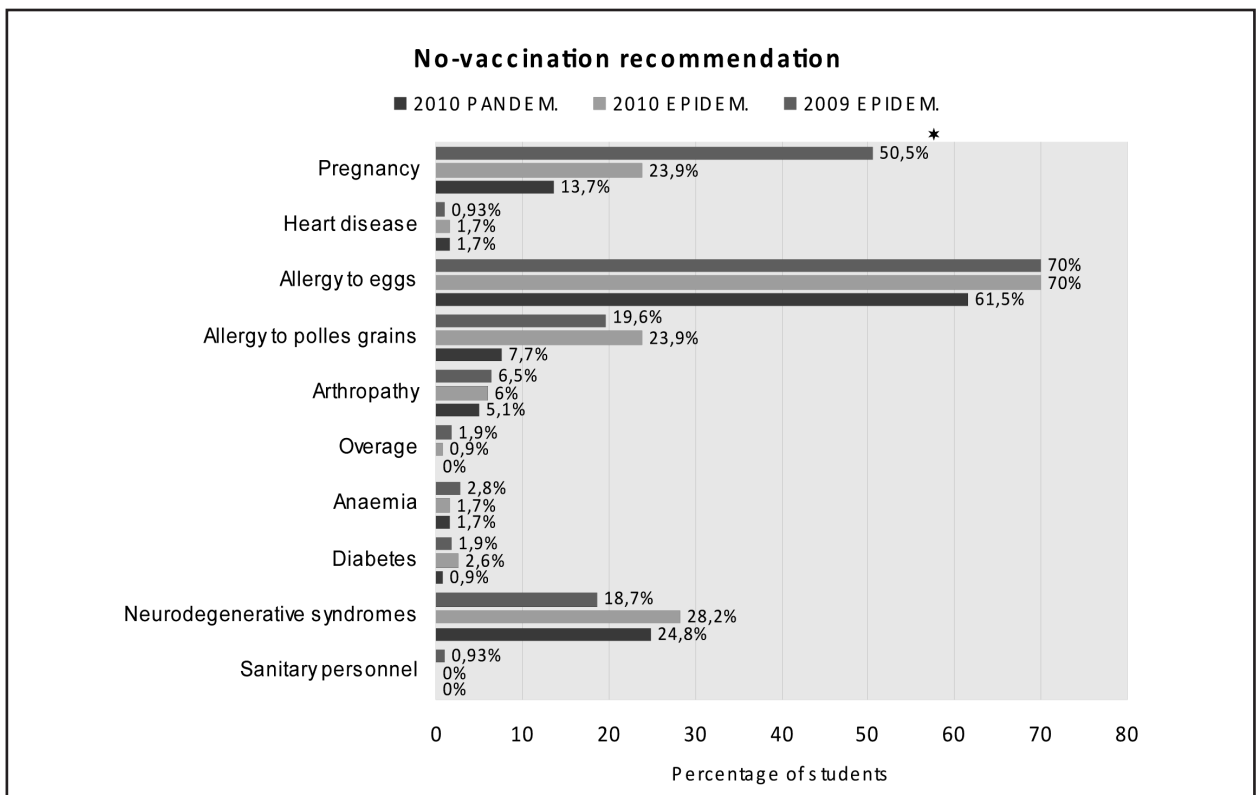


Figure 3. Population groups to whom vaccination is not recommended.

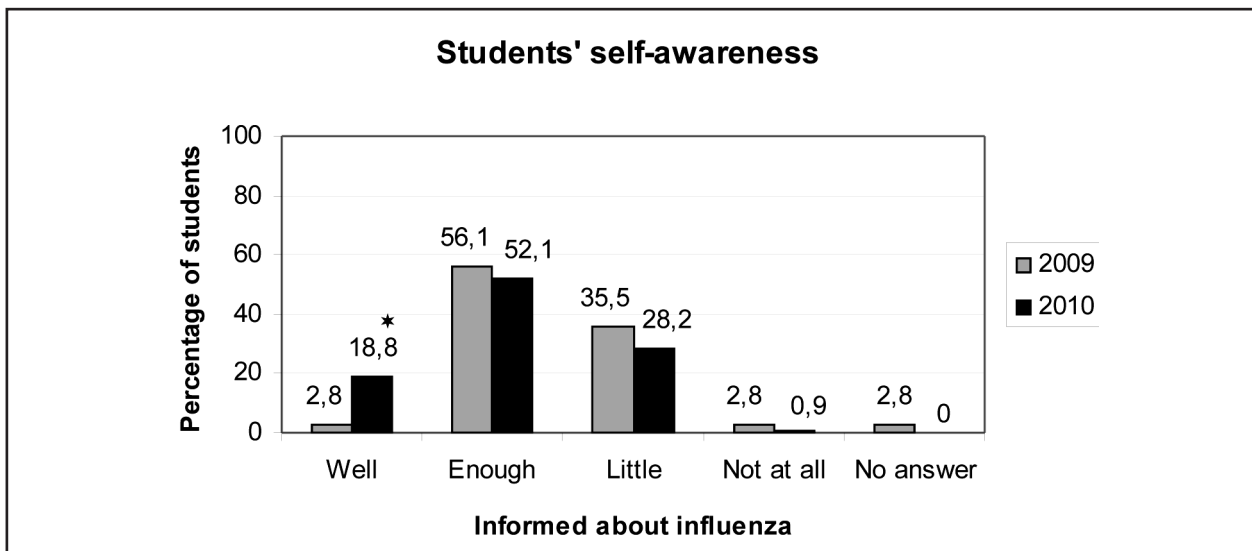


Figure 4. Students' self-awareness of their knowledge level about influenza.

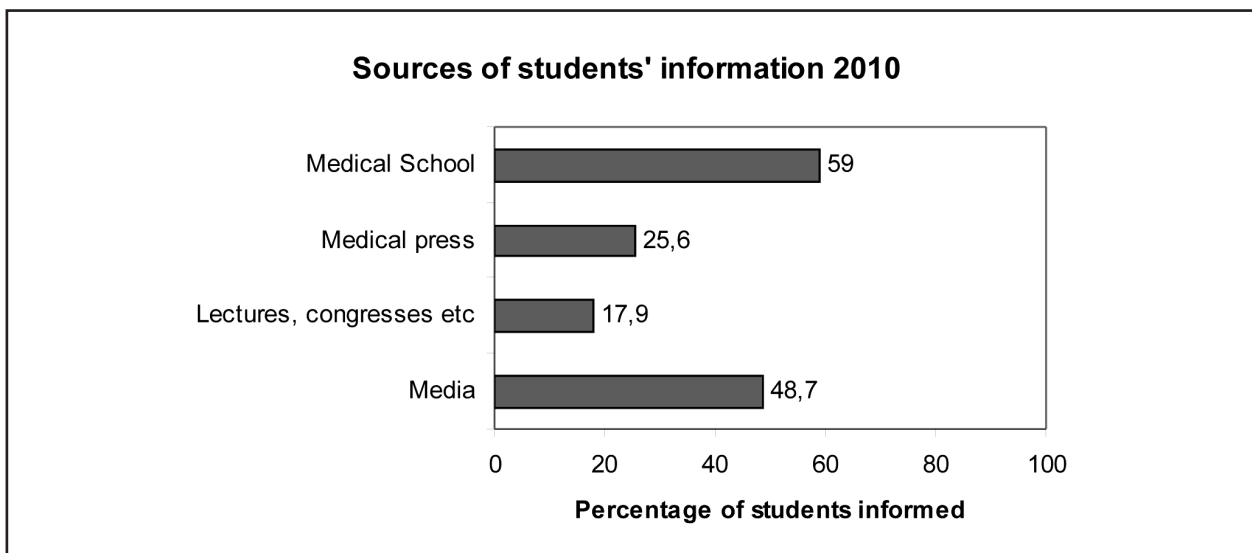


Figure 5. Sources of students' information about influenza during the pandemic.

and 61 (52.1%) respectively ($p = 0.5547$). However during the pandemic, in 2010, 22 (18.8%) students believed themselves quite well informed in contrast to 3 (2.8%) students in 2009, before the pandemic ($p = 0.0001$) (Figure 4). To the question whether they consider themselves more informed about influenza issues after the recent pandemic, 72 (61.5%) answered that they do, while 45 (38.5%) responded negatively. After data processing for 2009 and 2010, it was revealed that 47 (43.9%) and 49 (41.9%) were

well aware of their knowledge level ($p = 0.7574$), 26 (24.3%) and 23 (19.7%) overestimated their knowledge ($p = 0.4013$), whereas 31 (29%) and 45 (38.5%) underestimated themselves ($p = 0.1340$) respectively.

Last but not least, the source of students' information in 2010 was declared to be for 69 (59%) of them the Medical School, for 57 (48.7%) the media, for 30 (25.6%) the medical press and for 21 (17.9%) lectures, conferences or medical symposiums (Figure 5). The media seem not less significant than the Medi-

cal School ($p = 0.0955$) and, furthermore, present great statistically significant differences from medical press ($p = 0.0002$) and lectures, conferences etc ($p = 0.0000$).

DISCUSSION

Comparing the two questionnaires, 2009 and 2010, some interesting conclusions have been obtained. There were aspects of students' knowledge, which did not change much but remained steadily at high or low level. A really high percentage of the students (84-99.1%) was aware of influenza's viral etiology and knew that the virus is transmitted through the respiratory system by contagious droplets. On the contrary, a rather small number of students (24.6-35.2%) realized that children are the most susceptible to influenza. No important improvement was made about the difference between the terms "influenza" and "influenza-like-illnesses (ILI)" (42-49.7%). In addition, not a sufficient percentage (56.1-40.2%) of all participants knew the role of mutations and genetic recombination events in the outbreak of influenza epidemics and pandemics, while extraordinarily this percentage was lower after the pandemic.

However, there were aspects presenting notable changes. Students have improved their knowledge about the antigenic constitution of the virus, and almost doubled the number of the ones who knew that hand washing is an important way of protection. They have also improved their knowledge about the antiviral treatment as well, though the great majority referred not to anti-influenza compounds in general but mostly to oseltamivir using its commercial name, "Tamiflu". It is rather not a coincidence that all the above information has been widespread through the Media during the pandemic, along with advice for the use of masks and gloves, which was mentioned by none in 2009 but by 1/5 of the students in 2010. In conclusion, in the self-awareness section the students declare more confidence about their skills after the pandemic.

On the other hand, the pandemic did not only help students develop their adequacy about influenza, but also managed to confuse them, especially regarding to the differences between epidemics and pandemics, to lead them to miss former knowledge and to make the wrong choice in their anti-influenza strategy. For example, most of the students no longer seem to remem-

ber that the gastrointestinal system also gets affected by the influenza virus. However, the particularities of the recent pandemic were apparently believed by many of the participants of the 2010 research to be a rule for every influenza outbreak.

The section with the most evident changes was anti-influenza vaccination. In 2009 only about half of the students suggested vaccination as a preventive method. However, in 2010 they favored it even less, they did not seem to know the vaccine consistence quite well, nor could they properly recognize which population groups should or should not be vaccinated. In general, the students appear more cautious against all influenza vaccines after the pandemic. Relating reports indicate that health professionals in Canada³, Mexico⁴, Singapore⁵ and France⁶ were willing to be vaccinated against the pandemic while in Hong Kong they were not⁷. As for the way that non-health workers consider vaccination, studies still present controversial results, as the two thirds of the Australian public were willing to get vaccinated⁸ while the majority of the French⁹ and Spanish¹⁰ population were not convinced by the vaccination campaign. At the same time the restricted knowledge about pregnant women's vaccination noticed in our students resembles the one of the obstetric health care workers in Providence and Pittsburg¹¹.

As also indicated by a corresponding research from the University of Alberta, Canada¹², medical students generally seem to be at similar, satisfactory levels of knowledge about influenza in opposition to the rather poor knowledge of other medical students about common viral infections, such as the students of Shiraz, Iran¹³, and Oman¹⁴, about HBV and HCV or the students of Pakistan¹⁵, about HIV. American¹⁶ and Malaysian¹⁷ medical students' levels appear closer to our findings referring to their knowledge about HPV and HBV respectively, which means a really good knowledge on some aspects needing however improvement on others.

The fact that microbiology is taught during the fifth and sixth in a total of twelve semesters in our Medical School, has perhaps led to a partial decrease of the students' theoretical knowledge about influenza. This gap was tried to be completed by supplementary lectures before and during the pandemic.

Furthermore the Medias competed to University as a source of information about influenza. The results of a similar research in Belgium indicate the Medias as the most popular source of information, gathering almost double the percentage compared to their Medical School¹⁸. More researches from Slovakia¹⁹, and Tabriz, Iran²⁰, have had similar and even more impressive outcomes. This is a mere indication of the power of the Media upon masses, since, according to our research, the Media “illuminated” our future scientists almost equally to serious scientific conferences or lectures during the recent pandemic. Thus a higher level of knowledge has been established about subjects broadly discussed during the pandemic (e.g. medicines, vaccines) though the level about subjects less discussed through the Media (e.g. peptic system

effect) was worse than in the previous year. Moreover, the increased cautiousness of our students against influenza vaccines, including seasonal ones, after the pandemic, is of course not a result of their official medical training.

The knowledge level control of graduating students about influenza could be regarded as an example for other infectious diseases as well. Obviously the students, three years after the course of Microbiology, do retain their practical skills attending clinical lessons, but as for their theoretical background, this seems to be diminished. Therefore it might be useful if the basic medical education was somehow revised during the whole duration of medical studies, so that future doctors are no more “educated” by media reporters but by original scientists-teachers.

Αυριανοί γιατροί: Γνωρίζουν περισσότερα για τη γρίπη μετά την πανδημία;

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ΠΕΡΙΛΗΨΗ: Η γρίπη είναι ένα παγκόσμια διαδεδομένο νόσημα με ευρείες συνέπειες λόγω ετησίων επιδημικών εξάρσεων ή σπανιότερα πανδημιών, που ωστόσο μπορεί σε μεγάλο ποσοστό να προληφθεί. Γι' αυτό είναι σημαντικό να διαπιστωθούν οι θεωρητικές και πρακτικές ικανότητες των αυριανών γιατρών ως προς τη γρίπη.

Η μελέτη αυτή έχει σκοπό την εκτίμηση του γνωστικού επιπέδου των τελειόφοιτων της Ιατρικής σχετικά με τη γρίπη, πριν και κατά διάρκεια της πρόσφατης πανδημίας Α(H1N1) και να καταγράψει τις πιθανές διαφορές.

Συμμετείχαν συνολικά 224 φοιτητές του εκάστοτε τελευταίου έτους της Ιατρικής στις αρχές του 2009 και 2010, οι οποίοι συμπλήρωσαν ανώνυμα ερωτηματολόγια που αφορούσαν τη γρίπη από ιολογική και κλινική άποψη, τις πηγές ενημέρωσης των φοιτητών και την αυτογνωσία τους. Τα δεδομένα των δύο περιόδων υποβλήθηκαν σε συγκριτική ανάλυση προκειμένου να καθοριστεί η επίδραση της πανδημίας στα επίπεδα γνώσης των φοιτητών της Ιατρικής.

Οι συμμετέχοντες γενικά έδειξαν επαρκή θεωρητική και πρακτική κατάρτιση για τη γρίπη. Το γνωστικό τους επίπεδο εμφανίστηκε κάπως διαφοροποιημένο το 2010, παρουσιάζοντας είτε βελτίωση είτε σύγχυση οφειλόμενη στις ιδιαιτερότητες της πανδημίας. Τα μέσα ενημέρωσης είχαν σημαντική συμμετοχή στην πληροφόρηση των φοιτητών κατά τη διάρκεια της πανδημίας.

Θα ήταν ίσως χρήσιμο, η βασική εκπαίδευση να επαναλαμβάνονταν σε όλη τη διάρκεια των ιατρικών σπουδών, έτσι ώστε οι μελλοντικοί γιατροί να ανανεώνουν και να συμπληρώνουν τις γνώσεις τους συνεχώς και από τις σωστές πηγές.

Λέξεις Κλειδιά: Φοιτητές, Ιατρική, Γνώση, Γρίπη, Πανδημία, Μέσα ενημέρωσης.

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