MEDICAL FACULTY AND SCHOOL OF HEALTH STUDENT KNOWLEDGE OF AND BEHAVIOR REGARDING SWINE FLU AND VACCINE, IN KAHRAMANMARAS, TURKEY

Ali Ozer[1], Ekrem Kirecci[2], Hasan Cetin Ekerbicer[1] and Mustafa Celik[3]

[1]Department of Public Health, [3]Department of Family Medicine, Faculty of Medicine; [2]School of Health, Kahramanmaras Sutcuimam University, Kahramanmaras, Turkey

Abstract. This study was carried out to determine Medical Faculty and School of Health student knowledge of and behavior regarding swine flu and vaccine. The study was carried out at Kahramanmaras Sutcuimam University School of Health among the medical faculty and students. All 296 students of the Kahramanmaras Sutcuimam University School of Health and 76 students of the Faculty of Medicine were supposed to participate in the study. Ninety-six point one percent of the students in the study know high fever was one of the symptoms of swine flu, 91.8% said it was spread directly by sneezing or coughing and 95.5% knew washing hands with soap and water especially after coughing and sneezing, should be done to reduce the risk of infection. Sixty-five point four percent of students knew fatigue and body aches were adverse effects of the swine flu vaccine. Only 9.6% of students received the pandemic flu vaccine. Their knowledge regarding symptoms and methods of spread was low, but regarding measures taken for prevention was high. Both swine flu knowledge and vaccine knowledge were higher in those who received the flu vaccine than in those who did not receive it. In pandemic situations, training should be given immediately to medical, midwifery and nursing students who are models for society.

Keywords: pandemic flu, vaccine, student, knowledge, Turkey

INTRODUCTION

In Mexico, March 2009, a new flu virus affecting humans was detected (Perez *et al*, 2009). This H1N1 virus is a coated RNA virus from the Orthomyxoviridae family (Peiris *et al*, 2009). The virus spread rapidly throughout the world from Mexico, and on June 11, 2009, the World Health Organization (WHO) declared a pandemic phase 6 had begun (WHO, 2009, 2010; Health Protection Agency, 2010).

A pandemic flu virus is one that infects easily and quickly (Bronze, 2010; CDC, 2010; Ministry of Health, 2010). By November 15, 2009, pandemic flu cases had been seen in all cities in Turkey (Ministry of Health, 2010). A dead virus vaccine was developed against H1N1, and was used in Turkey. The vaccine is given in the deltoid muscle (Bronze, 2010).

Correspondence: Dr Ali Ozer, Department of Public Health, Medical Faculty, Kahramanmaras Sutcuimam University, Yoruk Selim Mah. Hastane Cad. No: 32, Tr-46100 Kahramanmaras, Turkey.
Tel: +90-344 221 2337; Fax: +90-344 221 2371
E-mail: aliozer91@hotmail.com

Health care personnel are an important occupational group who during the pandemic had large numbers of personnel who were infected with the disease and had a role in the treatment of patients (Bronze, 2010; CDC, 2010; Ministry of Health, 2010; WHO, 2010). Health personnel have a duty and a responsibility to take measures necessary to prevent the disease, including vaccination, and to educate society regarding this subject (Ministry of Health, 2010). Since students of the Faculty of Medicine and School of Health work as interns in health organizations, they are at risk group and must be vaccinated. Moreover, because they are healthcare personnel, their vaccination behavior affects society.

The necessary precautions (excluding vaccination) to prevent influenza infection include: covering the mouth and nose when sneezing using a handkerchief or with the arm, washing hands with adequate amounts of soap and water especially after coughing/sneezing, using paper towels to dry hands, using alcohol as a hand antiseptic, avoid touching the eyes, nose, or mouth with contaminated hands, those with swine flu must rest at home, those infected must avoid crowded places, workers should wear masks, and rooms must be aired out often (Lynch *et al*, 2007; CDC, 2009; CDC, 2010; Ministry of Health, 2010; WHO, 2010).

The aim of this study was to determine student knowledge and behavior regarding influenza and vaccination at the Faculty of Medicine and School of Health, Kahramanmaras Sutcuimam University.

MATERIALS AND METHODS

Setting and samples

The subjects were all 296 students of Kahramanmaras Sutcuimam University School of Health and 76 students of the Faculty of Medicine. No sampling was conducted.

The survey form prepared by researchers, involved 72 questions prepared by reviewing the literature. It was given to students to fill out; 4.6% of students could not be reached, therefore, 355 students (95.4%) participated in the study.

Data analysis

Correct answers for each of the 40 questions (Table 2) about "Swine flu" were awarded 1 point each. These points were labeled "Swine flu knowledge points." Similarly, correct answers for each of the 14 questions (Table 3) about the adverse effects of the "Swine flu" vaccine were each awarded 1 point. These points were labeled "vaccine knowledge points."

The data were entered into SPSS 15.0. For statistical comparison of groups, the Student's *t*-test and one-way ANOVA were used. Bonferroni analysis was conducted as a *post hoc* test. In all analyses, $p<0.05$ was accepted as significant.

Ethical considerations

The study was approved by the Ethics Committee of the Faculty of Medicine, University of Kahramanmaras Sutcuimam, and all subjects gave oral informed consent before participating in the study.

RESULTS

The age average of students participating in the study was 20.9±2.1; 28.5% of the subjects were males, and 71.5% females. Forty-two point eight percent of the students were studying nursing, 38.0% studing midwifery, and 19.2% were in the Faculty of Medicine (Table 1).

Only 9.6% of the subjects had received the swine flu vaccination; 43.7% of students stated that the swine flu vaccine was

Table 1
Socio-demographic properties of students participating in the study.

Socio-demographic properties	*n*	%
Gender		
Male	101	28.5
Female	254	71.5
Faculty		
Medical Faculty	68	19.2
School of Health	287	80.8
Department		
Nursing	152	42.8
Midwifery	135	38.0
Medical	68	19.2
Class		
1st Class	94	26.5
2nd Class	73	20.6
3rd Class	75	21.1
4th Class	72	20.2
5th Class	19	5.4
6th Class	22	6.2
Total	355	100.0

made in Turkey and was injected intramuscularly; 81.1% stated the swine flu was a pandemic.

Eighty-six point two percent of students stated a low percentage of the population had immunity against swine flu, 96.1% stated high fever was among the symptoms, 91.8% stated sneezing and coughing were modes of spread of the flu, and 95.5% stated measures to prevent infection included hand washing with adequate soap and water, especially after coughing or sneezing (Table 2).

The percentages of students who were aware of the adverse effects of the swine flu vaccine are presented in Table 3. Sixty-five point four percent of students stated body aches and fatigue were among the adverse effects of the swine flu vaccine.

The mean swine flu knowledge point (SFKP) score among subjects was 27.2±5.3, and the mean vaccine knowledge point (VKP) score was 4.2±3.6. The faculty of medicine students had SFKP and VKP scores significantly higher than the nursing students which were higher than the midwifery students ($p<0.05$). Each class of students had a significantly higher SFKP score than the year before it ($p<0.05$). Each class of students had a significantly higher VKP score than the year before it ($p<0.05$). The SFKP and VKP scores of those who received the swine flu vaccination were significantly higher than those who did not receive it ($p<0.05$) (Table 4).

DISCUSSION

Doubts about the swine flu vaccine occurred in Turkey and many other countries were raised by the media (Kurugol, 2009). This led to vaccination rates being low. Doubts about the safety of the swine flu vaccine occurred not only among non-medical personnel but also among health professionals. The vaccination rate (9.6%) was low among the students who participated in our study.

Pandemic flu symptoms include high fever, rhinitis, cough, sore throat, general body ache, headache, muscular aches, asthenia, fatigue, diarrhea, and vomiting (Myers *et al*, 2007; Greenberg *et al*, 2009; WHO, 2010). More severe cases may present with dyspnea, tachypnea, malnutrition, paleness, cyanosis, lethergy, and confusion (Dominguez *et al*, 2009; Greenberg *et al*, 2009; Uyeki, 2009; CDC, 2010; WHO, 2010).

The medical, midwifery and nursing students, who can easily access health information about the pandemic flu, do not have a good knowledge of pandemic flu. In the study group, 56.3-96.1% of the students knew the symptoms of mild to moderately severe pandemic flu cases, and

Table 2
Student knowledge regarding swine flu.

Properties of swine flu	Students who knew	
	n	%
Factor property		
It infects fast	291	82.0
It can live on surfaces for 2 hours	177	49.9
In the general population there is no immunity against the disease	306	86.2
Symptoms		
Slight mild and moderate cases		
Rhinitis	216	60.8
High fever (axillary temperature ≥ 38ºC)	341	96.1
Cough	233	65.6
Sore throat	222	62.5
General body ache	230	64.8
Headache	200	56.3
Muscular aches	218	61.4
Asthenia	317	89.3
Fatigue	250	70.4
Diarrhea	245	69.0
Vomiting	218	61.4
Severe cases		
Dyspnea	111	31.3
Mental confusion	92	25.9
Frequent and prolonged vomiting	74	20.8
Rapid and difficult respirations	98	27.6
Paleness and cyanosis	56	15.8
Malnutrition	148	41.7
Lethargy	133	37.5
Discomfort	158	44.5
Mode of spread		
Directly through sneezing or coughing	326	91.8
Through inhaling droplets suspended in the air	309	87.0
Through touching non-living surfaces contaminated with the virus	271	76.3
Through contact with the mouth, eyes, or nose after shaking hands with a person sneezing	323	91.0
It does not infect with sexual activity	70	19.7
It does not infect through the fecal-oral route	127	35.8
It does not infect via parenteral route	123	34.6
It does not infect via water	76	21.4
Measures taken to protect against swine flu		
Cover the mouth while coughing or sneezing	329	92.7
Cough/sneeze into the arm	288	81.1
Wash hands with adequate soap and water especially after coughing/sneezing	339	95.5
Use paper towels for drying hands	291	82.0
Use alcoho hand-wash	251	70.7
Avoid touching eyes, nose, or mouth with contaminated hands	307	86.5
Those infected with swine flu must rest at home and should not receive visitors	309	87.0
Those infected with swine flu must wear a mask	315	88.7
Those infected should remain as far away from crowded places as possible	310	87.3
Frequently air out the rooms they are in	318	89.6

Total *n*=355

Table 3
Student knowledge of the adverse effects of swine flu.

Adverse effects of swine flu vaccine	Students who knew	
	n	%
Often seen adverse effects		
Bruising, swelling, induration, cyanosis, pain on the site where the vaccine is applied	185	52.1
Indisposition, fatigue	232	65.4
Headache	165	46.5
Sweating, tremor	126	35.5
Joint ache, muscular ache	176	49.6
Rare adverse effects		
Anaphylaxis	81	22.8
Hypotension	84	23.7
Shock	101	28.5
Pain throughout where nerves pass	81	22.8
Thrombocytopenia	34	9.6
Vasculitis	44	12.4
Neuritis	76	21.4
Encephalomyelitis	74	20.8
Guillain-Barré syndrome	59	16.6
Total *n*=355		

15.8-44.5% of students knew the symptoms of more severe cases. Only some of the students knew pandemic flu causes infection through small particles containing the virus, scattered by patients to the environment by coughing, sneezing, and talking which enter the mucosa of the mouth, nose, or eyes directly, may occur due to contact with contaminated hands and fomites (Uyeki, 2009; Bronze, 2010; Ministry of Health, 2010). H1N1 has not been seen to infect people via food, sexual activity, water, or parenterally (Scalera and Mossad, 2009; Ministry of Health, 2010). Most students knew the ways swine flu infects patients, but few knew that it does not infect via sexual activity, fecal-oral transmission, blood, or water. Fear and lack of imformation caused some students to believe swine flu can be transmitted in these ways. Most students knew how to protect themselves from becoming infected with swine flu, probably because there was such a focus on the subject of protection against swine flu.

Possible adverse effects of the pandemic flu vaccine included bruising or pain at the injection site, headache, muscule and joint aches, fever, nausea, sweating, chills, tremor, and rare adverse effects, such as serious allergic reactions, anaphylaxis, neuritis, nephritis, vasculitis, thrombocytopenia, convulsion, encephalomyelitis, and Guillain-Barré syndrome (Peiris, 2009; Bronze, 2010; CDC, 2010; Health Protection Agency, 2010; Ministry of Health, 2010). Only a few students knew the adverse effects of the swine flu vaccine. Although adverse effects were discussed extensively and in an exaggerated

Table 4
Comparison of SFKP and VKP of students according to various variables.

Variables	*N*	SFKP (total point 40) Mean ± SD	VKP (total point 14) Mean ± SD
*Department			
Nursing	152	26.5±4.4[a]	3.9±2.9[a]
Midwifery	135	25.1±4.5[a]	2.9±2.6[a]
Medical	68	32.7±4.8[a]	8.0±4.1[a]
**Class			
1st Class	94	24.8±4.7[b]	2.1±2.0[b]
2nd Class	73	25.8±4.1[b]	3.7±2.9[c,d]
3rd Class	75	26.1±3.7[b]	3.7±2.4[c,d]
4th Class	72	29.4±5.2[c,d]	5.9±3.6[c,e]
5th Class	19	32.4±6.4[c]	8.9±4.6[c,e]
6th Class	22	33.6±4.5[c,e]	8.0±4.2[c,e]
***Swine flu vaccination			
Vaccinated	34	32.8±5.3	7.6±4.3
Non-vaccinated	321	26.5±4.9	3.9±3.3
Total	355	27.2±5.3	4.2±3.6

[a]All groups are different from each other; [b,c]:b is different from c_s; [d,e]d is different from e_s; SFKP, Swine flu knowledge point; VKP, vaccine knowledge point
* F/*p* 65.6/0.00 - 66.5/0.00
**F/*p* 23.9/0.00 - 31.2/0.00
***t/p 7.01/0.00 - 5.98/0.00

manner, students were not sure if there were these adverse effects or not, so they preferred not to get vaccinated.

The students' knowledge regarding swine flu and the vaccine were quite low. Training regarding the current pandemic should be carried out in schools of health and faculties of medicine and should include information about the virus, mode of spread, symptoms, protection measures and the importance and side-effects of vaccination.

Those who received the swine flu vaccine had more information about pandemic flu. This situation shows the importance of informing people about pandemic flu.

A limitation of the study was the relatively low number of the students taking part in the study since there is only one university in the city of Kahramanmaras.

REFERENCES

Bronze MS. H1N1 Influenza (Swine flu). eMedicine Oct 19, 2010. [Cited 2010 Jan 16]. Available from: URL: http://emedicine. medscape.com/article1673658-overview

Centers for Diseases Control and Prevention (CDC). Influenza A pandemic. 2009. [Cited 2010 Feb 20]. Available from: URL: http://www.ecdc.europa.eu/en/healthtopics/H1N1/Pages/home.aspx

Center for Disease Control and Prevention (CDC). Swine flu, 2010. [Cited 2010 Feb 20]. Available from: URL: http://www.

cdc.gov/H1N1FLU/

Dominguez-Cherit G, Lapinsky SE, Macias AE, *et al*. Critically ill patients with 2009 influenza A(H1N1) in Mexico. *JAMA* 2009; 302: 1880-7.

Dotis J, Roilides E. H1N1 influenza A infection. *Hippokratia* 2009; 13: 135-8.

Greenberg ME, Lai MH, Hartel GF, *et al*. Response after one dose of a monovalent influenza A (H1N1) 2009 vaccine – preliminary report. *NEJM* 2009; 25: 2405-13.

Health Protection Agency. Update on confirmed swine flu cases. 2010. [Cited 2010 Jan 16]. Available from: URL: www.hpa.org.uk/web/HPAweb&HPAwebStandard/HPAweb.

Kurugol Z. Are pandemic influenza vaccines safe? *Turk Klin J Pediatr* 2009; 18: 358-60.

Lynch JP, Walsh EE. Influenza: evolving strategies in treatment and prevention. *Semin Respir Crit Care Med* 2007; 28: 144-8.

Ministry of Health, Turkey. H1N1. 2010. [Cited 2010 Feb 20]. Available from: URL: http://www.grip.gov.tr

Myers KP, Olsen CW, Gray GC. Cases of swine influenza in humans: a review of the literature. *Clin Infect Dis* 2007; 44: 1084-8.

Peiris JS, Poon LL, Guan Y. Emergence of a novel swine-origin influenza A virus (S-OIV) H1N1 virus in humans. *J Clin Virol* 2009; 45: 169-73.

Perez-Padilla R, de la Rosa-Zamboni D, Ponce de Leon S, *et al*. Pneumonia and respiratory failure from swine-origin influenza A (H1N1) in Mexico. *NEJM* 2009; 361: 680-9.

Scalera NM, Mossad SB. The first pandemic of the 21st century: a review of the 2009 pandemic variant influenza A (H1N1) virus. *Postgrad Med* 2009; 121: 43-7.

Uyeki T. Antiviral treatment for patients hospitalized with 2009 pandemic influenza A (H1N1). *NEJM* 2009; 23: 110.

World Health Organization (WHO). Pandemic (H1N1) 2009. 2010. [Cited 2010 Jan 16]. Available from: URL: http://www.who.int/en/