

Impact of Nursing Guidelines on the University Student's Knowledge, Practice and Attitudes towards Swine Flu (H1N1)

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Abstract: Aim of the study: This study was conducted to determine the impact of nursing guidelines on the University student's knowledge, practice and attitudes towards swan flue (H1N1). **Research hypotheses:** H-1. University students who received nursing guidelines will have progress in their knowledge and attitudes regarding swan flue (H1N1) as measured by tools (1 & 2) H2 University students who received nursing guidelines will have progress in their preventive and hygienic care practice regarding swan Flue (H1N1) as measured by tools (3). **Design:** a quasi experimental research design was used with pre-post and assessment of outcomes. It involved three phases: assessment, implementation, and evaluation. **Setting:** The study was conducted at Faculties of Nursing Zagazig and Helwan Universities, Egypt. **Subjects:** The target population was first year students at Zagazig, and Helwan Universities representative faculty of nursing, science, medicine and pharmacy first year students (400 from, 11000 students which representing (37.4%), **Tools:** Three tools were used for data collection, 1) Interview form: was constructed and implemented by the researchers. It consisted of two parts. The first part covered student's characteristics and the second part included knowledge about swan flue. (2) Liker Scale-type questions regarding the attitudes toward H1N1 swan flue (H1N1) and (3) Assessment sheet regarding prevention and controlling measures which constitute two parts, (a) first part constitute 10 practical items about prevention and controlling measures and part (b) Observational checklist about hand wash skill. **Results:** There were statistically significant effects of the provided guidelines on students; knowledge, practice and attitude towards influenza A/H1N1. There were positive coefficients change in knowledge score and practices toward protective and preventive patterns. As well there was a slight improvement in the student's attitude toward influenza A/H1N1. The study **concluded** that the developed guidelines had a significant positive impact on students, knowledge, practices, and attitude toward influenza A/H1N1. This success is attributed to these guidelines are based on needs assessment and integration of updated technology. Therefore the study **recommended**, increasing the health educational guidelines provided through faculties of nursing as an effective method of health education. The guidelines should include detailed information about the disease, its symptoms in humans, simplified practical methods of protection and good hygienic practices. [Zeinab Hussain Ali, Nadia Mohamed Taha and Sahar Ahamed Shaphique. **Impact of Nursing Guidelines on the University Student's Knowledge, Practice and Attitudes towards Swine Flu (H1N1).** *J Am Sci* 2012;8(12):949-960]. (ISSN: 1545-1003). <http://www.jofamericanscience.org>. 131

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1. Introduction

Scientists and policy makers are concerned about the emergence of an influenza pandemic for which we will have neither a strain-specific vaccine nor sufficient antiviral medications at the onset of the outbreak [1]. Influenza pandemic is one that can be transmitted from infected person or animal to other person or animal, it is caused by an agent that is infectious and transmitted from a source or reservoir to susceptible host (2). A pandemic is a global disease outbreak. A flu pandemic occurs when a new influenza virus emerges for which people have little or no immunity, and for which there is no vaccine. The disease spreads easily from person-to-person, causes serious illness, and can sweep across the country and around the world in a very short time (3).

Swine flu is an acute respiratory disease of pigs, caused by one or more of the swine influenza viruses of type "A". This disease usually has high rate of morbidity but low mortality rate (1-4%) The virus spreads among pigs by droplets either by direct or indirect contact. Most of the affected pigs are asymptomatic, and the virus is spreading rapidly particularly among young people from ages 10 to 45. The severity of the disease ranges from very mild symptoms to severe illnesses that can result in death (4). The symptoms of swan flue /H1N1 in humans are similar to those of influenza and of influenza -like illness in general. Symptoms include fever, cough, sore throat, body aches, headache, chills and fatigue. The 2009 outbreak has shown an increased percentage of patients reporting diarrhea and vomiting. Swan flue H1N1 virus spreads between

humans through coughing or sneezing and people touching something with the virus on it and then touching their own nose or mouth. The H1N1 virus cannot be spread by pork products, since the virus is not transmitted through food (3).

Center of disease control and prevention (CDC, 2009)16 mentioned that people infected with seasonal and 2009 H1N1 flu shed virus and may be able to infect others from 1 day before getting sick to 5 to 7 days after. This can be longer in some people, especially children and people with weakened immune systems. The World Health Organization (WHO, 2009)3 mentioned that the highest rate of illness occurred in school, faculties and any crowded area as university. The students are the most susceptible group for infection and easy to combine transmission of infectious respiratory diseases, so it is necessary to target these groups to reduce the spread of this disease. The nurse is often the first health care provider seen by individual with a work-related health problem in the hospital, school, and university. The three main functions of faculties of nursing are health services, health education and promotion of health environment (5).

The earliest confirmed case of influenza A/H1N1 (Swine flu) in 2009 was reported in Mexico in March, and the World Health Organization declared the disease to be a pandemic-phase 6 on 11 June (1, 2). According to the W H O, as of 22 November 2009 the number of deaths resulting from pandemic H1N1 was 7826. The swine flu outbreak also affected Egyptians. As of 22 November 2009 as reported by WHO, the number of deaths due to the swine flue was 5 in Egypt. [1]. Influenza vaccines are one of the most effective ways to protect people from contracting illness during influenza epidemics and pandemics. Other preventive measures are using a mask; washing hands regularly with soap and water; aerating the environment; avoiding hugging, kissing and shaking hands; avoiding touching mouth and nose; avoiding close contact with people [1]. On 13 July 2009, the WHO also recommended that all countries should immunize their health care worker HCW as a first priority to protect the essential health infrastructure (2, 4). The potential benefits of influenza vaccination for health care worker (HCW) are three fold personal protections, protection of patients, and reduction of student and worker absenteeism [5].

Influenza A (2009 H1N1) vaccination of risk groups, primarily HCW, began on 2 November 2009 in Turkey [7]. Meanwhile, "The Prime Minister's personal refusal of getting vaccinated" and "vaccine's unsafely" appeared in Turkish media as negative news (6,12). It can be considered that this news had an impact on the public and HCW. Negative news on

the vaccine can affect people's level of anxiety related to the situation (vaccine). That HCW do not get vaccinated can be an important obstacle to success of campaigns. In Egypt there has been no study addressing the knowledge and attitudes towards influenza A/H1N1 vaccination. So that this study was carried out to determine the effect of nursing guidelines on the progress of **University students**, knowledge, practices and attitudes towards swan flue /H1N1

Significance of the study:

H1N1 virus infection is a significant health care problem because of the high percentage of the population affected and the serious consequences of uncontrolled influenza (H1N1) virus and also the highest rate of illness occurred in overcrowded area as (universities and, schools,). According To the Ministry of Health and Population (MOHP) announcement until January 2010, cumulative number of humans infected with "H1N1 virus" worldwide were 1623776 cases and 16665 deaths. In Egypt total number of /AH1N1 virus cases were 10,056 cases, and the number of deaths were (120) cases. In April 2009, a new strain of influenza virus, A/ H1N1, commonly referred as swine flue, began to spread in several countries around the world. Evidence that this new strain could pass from human to human led the World Health Organization to quickly raise its pandemic alert level to phase 5, which put big importance to our role in providing preventive and effective measures and knowledge that help in control transmission the virus and decrease complications (8, 9&10).

Aim of the study:

This study was carried out to determine the impact of nursing guidelines on the University student's knowledge, Practice and attitudes towards swan flue /H1N1.

Research hypotheses:

H₁: University Students who received nursing guidelines will have progress in their knowledge and attitude regarding swan flue/H1N1after implementation of the program than before as measured by tools (1 & 2).

H₂: University Students who received nursing guidelines will have progress in their preventive and hygienic care practice regarding swan flue /H1N1after implementation of the program than before as measured by tools (3).

2. Subjects and Methods:

Study design:

A quasi-experimental design, with pre-post and follow-up assessments was utilized to conduct the study.

Setting:

The study was conducted at campus attached to Zagazig and Helwan Universities, Egypt.

Subjects: Target population

The target population was first year university students from faculty of nursing, science, medicine and pharmacy at Zagazig, and Helwan Universities (11,000 students), total of students was 1950. The minimum sample size to represent this population at 95% confidence level was calculated to be 384. the researchers selected the sample from this faculties because those students have basic knowledge in their curriculum about chain of infection and the important of carried out the preventive methods to avoid the transmission of this infection and We selected our study sample by employing a systematic sampling method. One in every four student enrollment lists was selected for the study. The number of students selected for the sample was 486. The researchers collected data from 400 of this group (participation rate: 400/486), because some of the students were not available during the study period, some did not want to participate in the study and students in pilot study.

Tools and technique of data collection:

Data were collected by three tools: 1) Interview form: was constructed and implemented by the researchers. It consisted of two parts. The first part covered student's characteristics and the second part included knowledge about swan flue. (2) Liker Scale-type questions regarding the attitudes toward H1N1 influenza and (3) Assessment sheet regarding prevention and controlling measures which constitute two part (a) first part constitute 10 practical items about prevention and controlling measures and part (b) Observational checklist about hand wash Skills.

1- Interview form: was constructed and implemented by the researchers. It consisted of two parts.

- a. **The first part covered student's characteristics**, e.g., age, sex, history of common cold, history of vaccine against common cold, smoking, and past history of chest disease.
- b. **The second part included knowledge about**; definition of H1N1, types of swine flue, student's factors, signs and symptom, complications management. Total knowledge scores were as follow (2) for complete and correct answer (1) incompletely answer and (0) for wrong answer. Then student who obtained 60 or more takes satisfactory knowledge and who obtained less than 60 takes unsatisfactory knowledge.

2- Liker Scale-type questions regarding the attitudes toward swine flu (H1N1) influenza pandemic (adopted by Akan et al 2010³⁵): It contains 22 closed ended questions as follow, There is a swine influenza outbreak in the world currently, There is a seasonal influenza outbreak in the world, Swine influenza is a varied form of seasonal influenza, Swine flue could cause fatalities, Swine influenza transmits from human to human, There is a swine influenza outbreak in our country currently, Swine influenza isn't more serious than seasonal influenza, There is a seasonal influenza outbreak in our country, If I catch swine influenza, I will have the mild symptoms of the disease, Healthy people do not get swine influenza that easily, I have enough knowledge about swine influenza, If I take enough precaution I won't be infected even I am not vaccinated, Swine influenza antiviral treatment cures the disease completely, Everyone infected with swine influenza is required to use antiviral drug, Anyone who comes to contact with someone infected with swine influenza is required to use antiviral drug, Swine influenza vaccine need only be provided to those who in high risk groups, Swine influenza vaccine has few side effects, Seasonal influenza vaccine keeps also from swine influenza, I think everyone should be given swine influenza vaccine, Not enough information has been provided about swine influenza, Swine influenza vaccine and seasonal influenza vaccine must be provided together and the vaccine will stop the outbreak. Student who select agree takes 2 points, who select don't know will take 1 point and who select disagree will take zero with a total score of 44 as a maximum score and zero as a minimum score.

3- Assessment sheet regarding prevention and controlling measures : devolved by the researchers and included two parts (a) first part constitute 10 practical items each one has two selection achieved or not achieved and scored as follow take (1) for achieved answer and (0) for not achieved answer. The items were about university student's health habits regarding preventing and controlling infection, it consists of, hand wash, managed environment, isolation precautions, and used personal protective, respiratory etiquette, nutrition guideline, fluid guideline, exercises and activity, vaccination and medication guidelines. And second part constitute (b) Observational checklist about hand wash skill, it was designed to observe student's performance related to hand wash. It included the correct step of each hand wash. Each step was to be checked as achieved or not achieved. The step checked to be achieved was given a score of 1, and the not achieved given zero. The sum of the scores of each step in the procedure was converted into a percent score. The total score more

than 60% satisfactory and less than 60% unsatisfactory.

Content Validity:

Face and content validity of the tools were ascertained by a panel of seven experts in Medical-Surgical Nursing specialty who revised the tools for content, clarity, relevance, comprehensiveness, and ease for implementation. According to their opinion, minor modifications were applied.

Reliability of the tools 1, 2 and 3 were tested using test - retest methods, and Pearson correlation coefficient formula were used. It was found to be 0.988, 0.985 and 0.977 for each one consecutively.

Pilot study:

A pilot study was carried out on 40 students, who were excluded from the main study sample. They were chosen to test practicability, clarity and simplicity of the tools used, for detection of difficulties that might arise, some questions were added (e.g. nutrition guidelines), others were clarified (vaccination) or omitted (e.g., Types of vaccine). The pilot study took about one week.

Administrative and Ethical consideration:

At the initial interview, each potential subject was informed about the nature, purpose, and benefits of the study, and they were informed that their participation is voluntary. Confidentiality and anonymity of the subjects were also assured through coding of all data. The researchers assured that the data collected and information will be confidential and would be used only to improve their, knowledge, practice and attitude toward influenza (H1N1).

Filed study:

Procedure:

This quasi-experimental study was conducted at Zagazig and Helwan Universities, Egypt. Data collection was extended from November 2009 to April 2010. Approvals to conduct the study were taken from the presidents after explaining the aim of the study. The study was conducted through two main phases:

First phase concentrated on improving knowledge of the students about swan flue. This was done through three stages:

First stage (assessment stage): the aim of this stage was to assess the student's knowledge, practice and attitude regarding swine flu in addition to demographic data using assessment tool (1) (2) and (3).

Second stage (Implementation phase): the aim of this implementation phase to improve university student's knowledge, and attitude toward preventive and controlling measures regarding influenza (H1N1) During this phase, the developed

guidelines was provided to students in the students class room in the faculty of nursing in Zagazig and Helwan universities. This session include. (1) Theoretical part that started at (10 am – 12 md) and aims to improve student's knowledge and attitude about swine flu. This phase was conducted through lectures about swine flu, its nature, mode of transmission, symptoms and signs, incubation period, period of communicability, and preventive measures as wearing mask in crowded areas and using sleeve not hands when coughing or sneezing in case of unavailability of tissue. The program was implemented using power point media, brochures and pictures on the preventive methods of the disease and films. Following the lectures were open discussion for about (one hour) between students and the researchers which include asking questions and getting answers this done one time per week for consecutive 6 months each session takes three hours two hours for explanation and one hour for asking and discussion.

Third stage (evaluation phase): it followed the second stage and was conducted to evaluate the progress in the knowledge level and attitude among students using (tool 2) and Likert Scale-type questions.

Second phase:

That was started at (9 o'clock) in the day other than the day for theoretical part with the purpose of improving students, skills toward prevention and controlling procedure regarding swine flu which include, how to managed environment, isolation precautions, Used Personal protective, respiratory etiquette as continuous hand washing with soap and water, followed by covering of nose and mouth by tissue during coughing or sneezing, nutrition guideline, fluid guideline as taking a lot of fluids, fresh vegetables and fruit. It was conducted in the student's class room in the faculty of nursing at Zagazig and Helwan Universities for three consecutive weeks one time each week following the theoretical part. It also conducted through three stages (assessment, implementation and evaluation).

Assessment phase: it aims at assessment of students, level of skills toward hand washing in addition evaluating students, knowledge about preventive and controlling measures using **University students practice regarding prevention and controlling infection measures regarding swan flow** which include part (a) which constitute 10 items to prevent and part (2) observational checklist to assess students hand washing practice.

Implementation phase: it was conducted to improve students, knowledge and skills about, Hand washing (Wash hands with soap and water several times a day. Wash your hands after touching surfaces

continuously, Wash your hands especially after coughing, sneezing and after toilet). Control environment through (Stay away from gatherings and crowded places, Avoid approaching of the person with the disease, and Importance of the use of masks on the nose and mouth to prevent the spread of the virus), Isolation precautions to prevent spread of infection as (If you suffer of influenza-like symptoms committed to the house and told the attending physician, Must be diagnosed quickly by taking a swab from the nose or throat to determine if you are infected with swine flu or not, Avoid travel to affected areas, used personal protective). Respiratory etiquette to prevent spread of infection through; continuous hand washing with soap and water, these followed by covering nose and mouth by tissue when coughing or sneezing, and wearing mask. Nutrition guidelines to improve immune system through, eat your meals regularly, contain all the nutrients elements, and contain fiber cereals, vegetables, and fresh fruit especially orange and lemon. Fluid guideline as drink 2-3 liters of liquids per day, increase the amount of fluids if you feel up your body temperature, calculate the amount of fluid in and out of your body, taking a lot of fluids, fresh vegetables and fruit. Also improving immune system by vaccination, medication and Personal hygiene through (complete bed bath three times a week at least, not touching your eyes, nose before washing your hands, clean your eyes from the inside out, and clean your teeth after eating and before bedtime). Balanced between exercises, rest and sleep and so on.

There was session about the important, time, frequency, and technique of hand wash using power point, videos, demonstration and re-demonstration. It took around 2 hours, after that the students went to the labs and rest room in the faculties of nursing for application of hand wash procedure. Each student made at least three trials until mastering in the procedure. This is done for one day after the theoretical day each week for 6 consecutive months, about 6 hours at a time span of 9:00 to 15:00 every day. The students were scheduled to apply the procedure until all students become proficient at hand washing procedure and preventive and control measures. Each student was given at the end of the study written handout includes all previous guidelines to be followed in their lives

Evaluation phase:

Each student was evaluated three times during the study period utilizing the developed tools. The first evaluation was at the assessment phase; the second evaluation was six months after implementation of the training, and the third evaluation was done one month after the second evaluation. Using Interview form to assess the

progress of student's knowledge regarding preventive and controlling measures toward swine flu, Likert Scale-type questions regarding the attitudes toward H1N1 influenza and Assessment sheet to assess patient's practical regarding prevention and controlling measures and assess student's progress in the hand washing skills using the observational checklist as discussed in tool (3)

Statistical Design:

Data were analyzed using the Statistical Package for Social Sciences (SPSS), version 10. Qualitative data were presented as number and percents. Comparison between groups was done by Chi-square test. $P < 0.05$ was considered to be statistically significant results.

Results:

Table (1) shows that, more than half of the subjects were female (52%) with a mean age of 17.170 ± 3.667 . All students in the study sample (100%) had history of common cold. More than three quarters of the study sample (79%) had no history of Smoking habit or being vaccinated against common cold. less than three quarters of the study subjects (71%) had history of chest disease.

In relation to students, knowledge regarding swine influenza through phases of the study, **table (2)**, reveals that; most (94.0%) of the subjects total knowledge unsatisfactory before implementation of the nursing guidelines. The post nursing guidelines phase showed statistically significant improvements in students knowledge ($p < 0.001$), with all patients having satisfactory knowledge in almost all areas and in total knowledge. These improvements persisted during the follow-up period with only decline in one area of knowledge signs and symptoms as well as total knowledge ($p < 0.001$).

Table (3 and 4): Show subjects' attitudes toward swine influenza in the pre/ post and follow up program based on Likert Scale questions. It reveals that, majority of the students were aware of swine influenza, the global pandemic and the outbreak in Egypt, 82.00% (328/400) of the students believed that there was also a seasonal influenza outbreak in Egypt in the pre-intervention progress to become 90.00% (360/400) in the post program phase and progress to become (92.00%) 364 / 400 in the follow up phase, although at the time of the study there were only few confirmed cases of seasonal influenza.

In addition to 62.5% (250/400) of the students believed that swine flu was a modified form of seasonal influenza. Most of the student knew that swine influenza was transmitted from human to human (84.5%, 338/400) progress to become 91.25 (365 /400) and 92.00 (366 / 400) in the post and follow up stage consecutively. 50.5% (202/400) of the students thought that swine flu is less serious than

seasonal influenza which progressed to 70.00(280/400) and 71.00% (284 /400) in the post and follow up phases consecutively.

More than half 56.0% (224/400) of the students believed that healthy people cannot catch swine influenza so easily which progressed to 65.0% (260/ 400) in the post and follow up phases and 65.25% (261/ 400) thought that if they took enough precautions they wouldn't be infected even they had not vaccinated, which progressed to 68.75% (275/ 400) in the post and follow up assessment. Almost three fifth (59.5%) of the students believed that they had sufficient knowledge about swine flu (238/400, 59.5%) which progressed to 71.00% (284 / 400) in the post and follow up assessment. Almost one-third of the students had no idea about antiviral drugs and antiviral treatment. Slightly more than half of the study students 51.25% (205/400), disagree that the vaccine could stop the swine influenza outbreak which declined to 47.50% (190 / 400) in the post and follow up assessment.

As well less than thirdly 30.75% (123/400) stated that anyone who comes to contact with someone infected with swine influenza is required to use antiviral drug progressed to 45.0% (180/ 400) and 47.00% (188 /400) in the post and follow up assessment consecutively. Only 15.0% (62 /400) believed that the vaccine has few side effects which progressed to 42.50 % (170/ 400) and 43.5% (174 /400) in the post follow up assessment consecutively. More than half 55.0% (220/400) of the students thought that insufficient information has been provided regarding the vaccine against swine influenza which declined to 65.00% (260/ 400) in the post and follow up assessment. **Table (3& 4)** also indicates an improvement in total positive attitudes towards swine influenza of the students, from 44.5% at the pre-intervention phase, to 58.0% at the post phase.

Table (5): points to statistically significant improvements in students' Practices about prevention and control of swine flu methods after implementation of the nursing program. These improvements continued throughout the follow-up phase. The lowest percentages of achieved practice before the guidelines were related to using personal protective devices (3.25%). Overall, 10.5% of the students had total achieved Practices at the pre-assessment which increases to 79.8% and 73.6% at the post and follow-up phase, respectively.

Table (6): displays the relations between students' knowledge and their practices regarding Swine Flu. There are statistically significant differences among various categories of the study

subjects in relation to knowledge and their practices regarding Swine Flu throughout the study phases (pre& post &pre & follow up ($p < 0.001$), while there are no statistically significant differences between post and follow up.

Figure (1): Summarizes the total scores of knowledge, practices and attitude of various parameters throughout the program phase. It demonstrates significant increase in the scores of knowledge, practices and attitude at the post-implementation phase, which was sustained at the follow-up phase. Improving students' knowledge was from 6% to 92.5%, and 89.75 % in pre, post and follow up respectively. In relation to students' practices, there were also improvements from 44.5 to 79.8 and 73.6 in pre, post and follow up intervention phases. In relation to students' attitude there were slight improvements in their attitude from 44.5 at the pre-program equal to percentage of 58.0% throughout study phases, pre, post and follow up. There were statistically significant differences among various categories of the study subjects in relation to knowledge, practices and their attitudes toward swine influenza throughout the study phases.

Table 1 Bio-Socio-demographic characteristics and History of swan flue among personal in the study sample (n=400)

Sex:	No	%
Mal	192	48.00
Female	208	52.00
Sample:		
Student in Universities	320	80.00
Teacher in school	80	20.00
History of common cold:		
Yes	400	100.00
History of vaccine against common cold:		
No	316	79.00
Yes	84	21.00
Smoking:		
Yes	84	21.00
No	316	79.00
History of chest disease:		
Yes	284	71.00
No	116	29.00
Age	23.170±5.667	

Table (2): Students, Knowledge about swine flu at three different times (pre, post and follow up phases of the study (no. 400)

Item	Pre		Post		Follow up		Chi-square	
	No	%	No	%	No	%	X ²	P-value
Definition of H1N1	52	13.00	364	91.00	375	93.75	780.069	<0.001*
Types of swine flow	24	6.00	352	88.00	375	93.75	875.721	<0.001*
Precipitated factors	24	6.00	352	88.00	375	93.75	862.565	<0.001*
Signs and symptoms	24	6.00	318	79.50	240	60.00	509.538	<0.001*
Complications	24	6.00	318	79.50	375	93.75	806.662	<0.001*
Management	24	6.00	318	79.50	375	93.75	806.662	<0.001*
Total Knowledge	24	6.00	370	92.5	340	85.0	797.441	<0.001*

Table (3): Likert Scale Questions to assess student's Attitudes toward Swine Flu in the pre and post study phases.

Items	Pre						Post						Chi-square	
	Disagree		don't know		Agree		Disagree		don't know		Agree		X ²	P-value
	N	%	N	%	N	%	N	%	N	%	N	%		
There is a swine influenza outbreak in the world currently	324	81.00	16	4.00	47	11.75	310	77.50	11	2.75	71	17.75	6.085	0.048
There is a seasonal influenza outbreak in the world	47	11.75	50	12.50	303	75.75	50	12.50	20	5.00	330	82.50	14.102	0.001
Swine influenza is a varied form of seasonal influenza	79	19.75	71	17.75	250	62.50	50	12.50	30	7.50	320	80.00	31.759	0.000**
Swine influenza could cause fatalities	122	30.50	54	13.50	224	56.00	90	22.50	40	10.00	270	67.50	11.199	0.004
Swine influenza transmits from human to human	35	8.75	27	6.75	338	84.50	20	5.00	15	3.75	365	91.25	8.556	0.014
There is a swine influenza outbreak in Egypt currently	42	10.50	30	7.50	328	82.00	20	5.00	20	5.00	360	90.00	11.295	0.004
Swine influenza isn't more serious than seasonal influenza	125	31.25	73	18.25	202	50.50	80	20.00	40	10.00	280	70.00	32.138	0.000**
There is a seasonal influenza outbreak in Egypt	77	19.25	63	15.75	260	65.00	50	12.50	55	13.75	250	62.50	3.810	0.149
If I catch swine influenza, I will have the mild symptoms of the disease	64	16.00	160	40.00	176	44.00	43	10.75	115	28.75	242	60.50	21.906	0.000
Healthy people do not get swine influenza that easily	120	30.00	56	14.00	224	56.00	100	25.00	40	10.00	260	65.00	7.163	0.028
I have enough knowledge about swine influenza	86	21.50	75	18.75	238	59.50	66	16.50	50	12.50	284	71.00	11.684	0.003
If I take enough precaution I won't be infected even I am not vaccinated	78	19.50	62	15.50	261	65.25	70	17.50	55	13.75	275	68.75	1.216	0.545
Swine influenza antiviral treatment cures the disease completely	205	51.25	135	33.75	60	15.00	190	47.50	100	25.00	110	27.50	20.488	0.000**
Everyone infected with swine influenza is required to use antiviral drug	142	35.50	120	30.00	138	34.50	120	30.00	80	20.00	200	50.00	21.220	0.000**
Anyone who comes to contact with someone infected with swine influenza is required to use antiviral drug	169	42.25	109	27.25	123	30.75	130	32.50	90	22.50	180	45.00	17.623	0.000**
Swine influenza vaccine need only be provided to those who in high risk groups	132	33.00	90	22.50	178	44.50	100	25.00	50	12.50	250	62.50	27.955	0.000**
Swine influenza vaccine has few side effects	194	48.50	146	36.50	60	15.00	130	32.50	100	25.00	170	42.50	73.852	0.000**
Seasonal influenza vaccine keeps also from swine influenza	204	51.00	144	36.00	52	13.00	199	49.75	95	23.75	106	26.50	28.564	0.000**
I think everyone should be given swine influenza vaccine	260	65.00	78	19.50	62	15.50	210	52.50	50	12.50	140	35.00	41.563	0.000**
. Not enough information has been provided about swine influenza	110	27.50	70	17.50	220	55.00	90	22.50	50	12.50	260	65.00	8.667	0.013
Swine influenza vaccine and seasonal influenza vaccine must be provided together	160	40.00	160	40.00	80	20.00	100	25.00	80	20.00	220	55.00	105.846	0.000**
The vaccine will stop the outbreak	225	56.25	110	27.50	65	16.25	200	50.00	100	25.00	100	25.00	9.371	0.009
Total attitudes	136	34.00	86	21.50	178	44.50	110	27.50	58	14.50	232	58.00	15.305	0.000**

** Highly significant

Table (4): Likert Scale Questions to assess student's Attitudes toward Swine Flu in the Pre and Follow up phases.

Items	Pre						Follow /up						Chi-square	
	Disagree		don't know		Agree		Disagree		don't know		Agree		X ²	P-value
	N	%	N	%	N	%	N	%	N	%	N	%		
There is a swine influenza outbreak in the world currently	324	81.00	16	4.00	47	11.75	310	77.50	11	2.75	72	18.00	6.085	0.048
There is a seasonal influenza outbreak in the world	47	11.75	50	12.50	303	75.75	50	12.50	20	5.00	332	83.00	14.102	0.001
Swine influenza is a varied form of seasonal influenza	79	19.75	71	17.75	250	62.50	50	12.50	30	7.50	318	89.50	31.759	0.000**
Swine influenza could cause fatalities	122	30.50	54	13.50	224	56.00	90	22.50	40	10.00	270	67.50	11.199	0.004
Swine influenza transmits from human to human	35	8.75	27	6.75	338	84.50	20	5.00	15	3.75	366	92.00	8.556	0.014
There is a swine influenza outbreak in Egypt currently	42	10.50	30	7.50	328	82.00	20	5.00	16	4.00	364	92.00	11.295	0.004
Swine influenza isn't more serious than seasonal influenza	125	31.25	73	18.25	202	50.50	80	20.00	36	9.00	284	71.00	32.138	0.000**
There is a seasonal influenza outbreak in Egypt	77	19.25	63	15.75	260	65.00	50	12.50	55	13.75	252	63.00	3.810	0.149
If I catch swine influenza, I will have the mild symptoms of the disease	64	16.00	160	40.00	176	44.00	43	10.75	115	28.75	244	61.00	21.906	0.000
Healthy people do not get swine influenza that easily	120	30.00	56	14.00	224	56.00	100	25.00	40	10.00	260	65.00	7.163	0.028
I have enough knowledge about swine influenza	86	21.50	75	18.75	238	59.50	66	16.50	50	12.50	284	71.00	11.684	0.003
If I take enough precaution I won't be infected even I am not vaccinated	78	19.50	62	15.50	261	65.25	70	17.50	55	13.75	275	68.75	1.216	0.545
Swine influenza antiviral treatment cures the disease completely	205	51.25	135	33.75	60	15.00	190	47.50	100	25.00	110	27.50	20.488	0.000**
Everyone infected with swine influenza is required to use antiviral drug	142	35.50	120	30.00	138	34.50	120	30.00	80	20.00	200	50.00	21.220	0.000**
Anyone who comes to contact with someone infected with swine influenza is required to use antiviral drug	169	42.25	109	27.25	123	30.75	130	32.50	86	20.50	188	47.00	17.623	0.000**
Swine influenza vaccine need only be provided to those who in high risk groups	132	33.00	90	22.50	178	44.50	100	25.00	50	12.50	250	62.50	27.955	0.000**
Swine influenza vaccine has few side effects	194	48.50	146	36.50	60	15.00	130	32.50	96	21.00	174	43.50	73.852	0.000**
Seasonal influenza vaccine keeps also from swine influenza	204	51.00	144	36.00	52	13.00	199	49.75	95	23.75	106	26.50	28.564	0.000**
I think everyone should be given swine influenza vaccine	260	65.00	78	19.50	62	15.50	210	52.50	50	12.50	140	35.00	41.563	0.000**
. Not enough information has been provided about swine influenza	110	27.50	70	17.50	220	55.00	90	22.50	50	12.50	260	65.00	8.667	0.013
Swine flu vaccine and seasonal influenza vaccine must be provided together	160	40.00	160	40.00	80	20.00	100	25.00	80	20.00	220	55.00	105.846	0.000**
The vaccine will stop the outbreak	225	56.25	110	27.50	65	16.25	200	50.00	100	25.00	100	25.00	9.371	0.009
Total attitudes	136	34.00	86	21.50	178	44.50	110	27.50	58	14.50	232	58.00	15.305	0.000**

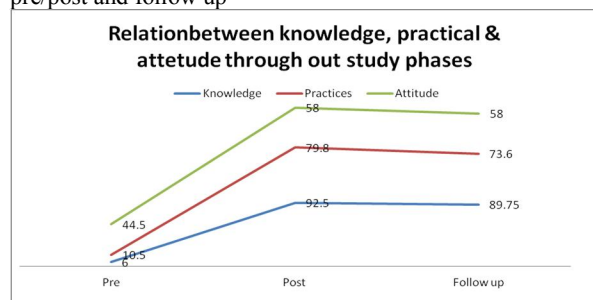
** Highly significant

Table (5): University Students Practical Regarding Prevention and Controlling Measures Regarding Swine flu Throughout Study phases (Pre/ Post and Follow /up (no= 400)

Variable	Pre				Post				Flow up				Chi-square	
	not achieved		Achieved		not achieved		Achieved		not achieved		Achieved		X ²	P-value
	No	%	No	%	No	%	No	%	No	%	No	%		
Hand hygiene	352	88.00	48	12.00	92	23.00	308	77.00	159	39.75	241	60.25	236.070	0.000
Managed environment	354	88.50	46	11.50	48	12.00	352	88.50	92	23.00	308	77.00	565.022	0.000
Isolation precautions	383	95.75	17	4.25	88	22.00	312	95.75	120	30.00	280	70.00	524.178	0.000
Used Personal protective	387	96.75	13	3.25	100	25.00	300	96.75	104	26.00	296	74.00	541.702	0.000
Respiratory etiquette	376	94.00	24	6.00	92	23.00	308	94.00	100	25.00	300	75.00	524.479	0.000
Nutrition guideline	384	96.00	16	4.00	88	22.00	312	96.00	120	30.00	280	70.00	527.881	0.000
Fluid guideline	369	92.25	31	7.75	40	10.00	360	92.25	80	20.00	320	80.00	667.381	0.000
Exercises and activity	384	96.00	16	4.00	80	20.00	320	96.00	88	22.00	312	78.00	604.187	0.000
Vaccination	376	94.00	24	6.00	88	22.00	312	94.00	80	20.00	320	80.00	573.745	0.000
Medication guideline	214	53.50	186	46.50	92	23.00	308	77.00	112	28.00	288	72.00	94.304	0.000
Total Practices			42	10.5			319	79.8			294	73.6		0.000

Table (6): Relation between students' pre-program knowledge about swine flu and their practices at three different time (pre, post and follow up phases of the study (no. 400)

Variable					Paired t-test		
		Range	Mean	± SD	Pre & Post	Pre & FU	P-value
Practices	Achieved	10.000 - 17.000	26.685	± 3.631	-33.731	-30.422	<0.001*
	Not achieved	20.000 - 47.000	15.450	± 2.843	Post & FU	-1.795	0.091
Knowledge	Satisfactory	14.000 - 42.000	72.628	± 8.574	-22.088	-18.970	<0.001*
	Unsatisfactory	41.000 - 83.000	38.878	± 3.283	Post & FU	1.221	0.131

Fig. 1 Relation between knowledge, practices and attitude pre/post and follow up

Discussion

In spite of the increase in the number of influenza A (H1N1) cases as well as the responses of the WHO by raising its pandemic alert status to phase 6 and extensive media coverage, students' responses to influenza A (H1N1), were muted. So, higher education institutions have potential of becoming serious outbreak centers during a pandemic flu, the knowledge and attitudes of the university students toward a pandemic are important for compliance to

the directives of health authorities. In current study group, most of the university students knew that there was H1N1 outbreak in the world and in Egypt country and believed that they had sufficient knowledge about the subject, but they had less knowledge about the availability and effectiveness of antiviral drugs. As well, it seems that the terms of seasonal influenza and pandemic influenza were confused with each other. Most of the students thought that swine influenza was a modified form of seasonal influenza and that there was also a seasonal influenza outbreak in Egypt although only few such cases has been identified before or during the study period. In this study analyzing the factors associated with knowledge, practices, attitudes and lifestyle about influenza A (H1N1) indicated that, majority of the students had a lack in the knowledge, practices and attitude towards influenza A/H1N1. These results indicated the importance of life style modification patterns on the improvement of the students, Knowledge, practices and attitude towards influenza A/H1N1.

In relation to socio-demographic characteristics of the students, the findings of the present study revealed that, female student's excesses the male students. These results could be attributed to, that the study was conducted in the faculty of nursing where majority of students were females. This result was in line with other scattered studies (11, 12, & 18) which mentioned that, risk perception was higher in females than males in the whole group. As well, [18 & 19] stated that, it is well-known that there are gender differences in the context of risk perception. Perceptions of environmental health risks are much higher in female, although underlying dynamics are not well understood. In the researcher own view that may result from the responsibilities of the Egyptian females' toward families that make them provide the correct method of prevention and protection during pandemic period.

It is evident also that, all of the students had a history of common cold and less than three quarter of them had chest disease. this would be attributed to the fact that, the majority of the sample were from Helwan University where a lot of cement factories, that causes air pollution affect on the upper respiratory tract of the students residing this area. These results are consistent with other several studies (13, 14, 15 and 20) which reported that, long-term exposure to cement dust is considered common cause, that leads to higher morbidity of severe respiratory disease. Around fifth r of the study subjects have a history of smoking and vaccination against common cold, these results could be due to that majority of the students s were female and smoking is not common among Egyptian females, and common cold vaccine is not from the recommended immunization in Egypt.

As regards subjects, knowledge before and after implementation of nursing guidelines, the finding of the current study showed improvements in the subjects, knowledge regarding swine flu A/H1N1 in the post and follow up assessments as compared to pre-assessment. this may be due to the provided program that included, lectures about swine flu, its nature, mode of transmission, signs and symptoms, incubation period, period of communicability, and preventive measures as wearing mask in crowded areas and using sleeve not hands when coughing or sneezing in case of unavailability of tissue. During this session, the researchers used a wide Variety of teaching methods as power point media, brochures and pictures about the preventive methods of the disease as well as films in addition to open discussion for about (one hour) in each session. This finding is in an agreement with another study ⁽¹⁶⁾, which reported that, the minority of the respondents was aware of nature, mode of transmission, signs and symptoms, incubation period, period of

communicability, and preventive measures for H1N1 Influenza and perceived their personal risk of influenza. However the previous study contradicted with another one carried out in 1990 (22), who stated that, the majority of respondents were aware of all high risk group and knowledge about influenza A/H1N1 complications. As well results indicated the important role of university during the pandemic period.

Concerning improvement in the students, attitude toward swine flu A/H1N1, there was an improvement in students, attitude regarding influenza A/H1N1 in the second and follow up assessment as compared to pre program, this could be due to the provided program which included many methods of explanation, discussion and answering all the students, questions that was about influenza A/H1N1 anti-virus, preventive and protective methods, the high risk group for infection as well as correction and clarification given by the researcher for the students about a lot of wrong beliefs and ideas about nature of the virus, the most common source of infection, vaccine, method of transmission, protective methods and management, these results come in line with two other studies carried out in 2007 (15 and 17), which stated that, mass media was the most important information source regarding influenza pandemics.

In cross sectional telephone statewide survey, ⁽²³⁾ concluded that building close and amiable relationships with the media might also have been critical so that at the time of pandemic crisis, the media could play a role in disseminating information, not fear. The minority in the improvement could be attributed to the young age of studied students, their healthy and their risk perceptions were at the middle level and they believed that if they caught the swine influenza they would experience mild symptoms of the disease. These factors might have affected their attitudes toward the vaccination against H1N1, although it was founded in relatively recent studies that younger populations are much more susceptible than the elderly [23&25]. when the researchers explored their reasons for not to be vaccinated, they found that safety, effectiveness and lack of information were the major concerns consistent, that comes in line with ⁽²⁷⁾ in their study found that 21% of their study which was conducted just at the beginning of the pandemic, population had high anxiety about swine influenza vaccine [24].

Regarding influenza A/H1N1 outbreak in the world currently, there was a little change among students in the post and follow up assessment, this could be attributed to the continuous explanation and answering students, questions regarding nature of the virus, the most common source of infection, method of transmission, also majority of the subject get their

knowledge from T.V or news papers This comes in line with (28) found that the majority of respondents had received information from the mass media (television %95, news papers 85%) [29]

Regarding influenza A/H1N1 antiviral treatment, there was an improvement in the students' attitude regarding influenza A/H1N1 antiviral in the post and follow up assessment; this could be attributed to the continuous explanation and answering students, questions regarding the important of taking /H1N1 anti-virus as well could be related to the provided hand out that provided for the students about preventive and controlling measures to avoid swan flue. This was in line with (30-31) which founded that, students following attendance of the health related science program were significantly more willing to be vaccinated.

Regarding students, practices related to protective and preventive measures, there was a highly statically significance improvement among students' practices regarding protective and preventive measures for influenza A/H1N1 in the post and follow up assessments; this could be attributed to the provided practical session that was conducted towered managed environment, isolation precautions, Used Personal protective, respiratory etiquette as continuous hand washing with soap and water, followed by covering of nose and mouth by tissue during coughing & sneezing, nutrition guideline, fluid guideline as taking a lot of fluids, fresh vegetables and fruit especially which contain vitamin C as well as students were advised to keep away from other people, to practice exercises and activities, to take vaccination and medication guideline. These findings are in an agreement with (32) which reported that, about two thirds of respondents knew the preventive methods of swine flu A/H1N1. This might be due to the official conducted by the ministry of health and training program, television, brochures and pictures on the preventive methods of the disease as well a more recent study (33), which reported that, most of students' sources of information was from television, friends and healthcare providers.

Concerning relations between students pre-intervention knowledge about swan flow and their practice, the present study indicated that, there was statistically significant differences among various categories of the study subjects in relation to knowledge and their practice regarding Swine Flu throughout study phases pre/ post and pre / follow up ($p < 0.001$), this findings come with a study (29) which reported that, the students' practices score was significantly affected by students knowledge. As well as recent study (26) founded, a strong correlation was detected between respondents' knowledge and both practices and attitudes

Concerning Relations between knowledge, practices and attitude pre/post and follow up, the present study found that, significant increase in the scores of knowledge, practices and attitude at the post-intervention phase, which was sustained at the follow-up phase, that indicated the effectiveness of the provided program in improving students, knowledge, practice and attitude towered swan flue protective measures. As well findings (27) reported that, knowledge has a significant influence on attitudes and practices in a pandemic area. While these findings are incongruent with another study (28), which reported that, there was no statistically significant correlation between students' knowledge and practices as well as attitude and practices. This due to practices and attitude's score was significantly higher in those with good knowledge

Conclusions and recommendations:

The study concludes that the developed program had a significant positive impact on students, knowledge, practices, and attitude toward influenza A/H1N1. This success is attributed to that the program is based on needs assessment. Therefore, recommended to increase the health educational messages provided through health educator (faculties of nursing) The message should include detailed information about the disease, its symptoms in humans, simplified practical methods of protection and good hygienic practices.

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References

- 1- **World Health Organization (WHO). (2009):** Pandemic Influenza. Available at: <http://www.who.int/mediacentre/factsheets/fs211/en/index.html>. Accessed in May 8 / 2010.
- 2- **Dumar, A. (2009):** Swine Flu: What You Need to Know. (1st ed.) USA. P. 7.
- 3- **Class, E.,C, Osterhaus, A.D., van, Beek, R, De, Jong, J.C, Rimmelzwan, G.F., & Senne, D.,A,(2008) :** Human Influenza A H5N1 virus related to highly pathogenic avian influenza virus. *Lancet*, 351:472-7.
- 4- **Peiris, J.S, Yu, W.C, Leung, CW, Cheung, C.Y, N.g., W.F, & Nicholls, J.,M, (2004):** Reemergence of fatal human influenza A subtype H5N1 disease. *Lancet*, 363:582-3.
- 5- **Michaelis, M, & Doerr, HW: Novel swine-origine influenza A virus in humans (2009):** Another pandemic knocking at the door. *Med Microbiol Immunol.*, 198:175-183.
- 6-. **Michaelis, M, Doerr, H.W., & Cinatl, J.,(2009):** An Influenza A H1N1 Virus Revival- Pandemic H1N1/2009 Virus. *Infection*. 37:381-9.

- 7-. **Chang, L.-Y, Shih, S-R, Shao, P-L, Huang, DT-N, & Huang L.M, (2009):** Novel Swine origin Influenza Virus A (H1N1): The First Pandemic of the 21st Century. *J Formos Med Assoc* 2009, 108:526-532.
- 8- **World Health Organization, (2011):** Global outbreak and alert and response network. Available at [<http://www.who.int/csr/outbreaknetwork/en>]
- 9- **World Health Organization (2009):** Global alert and response: guidelines, recommendations, descriptions. Available at [<http://www.who.int/csr/disease/swineflu/Updates/en/index.html>].
- 10- **Centers for Disease Control and Prevention (2009):** US outbreak of swine origin influenza A (H1N1) virus infection-Mexico March-April (2009) [<http://www.cdc.gov/mmwr/preview77mmwrhtml/mm58d0430a2.htm>].
- 11- **Margaret, Chan. (2009):** World now at the start of 2009 Available at [<http://www.who.int/mediacentre/news/statements>].
12. **Lau, J.T.F, Yang X, Tsui H, & Kim JH (2003) :** Monitoring community psychological responses to SARS epidemic in Hong Kong: From day 10 to 62. *J Epidemiol Community Health* 2003, 57:864-870.
13. **Tang, C.S.K, Wong, S-Y., (2004):** Factors influencing the wearing of facemasks to prevent the severe acute respiratory syndrome among Chinese in Hong kong., *Am J Public Health* :39:1187-93.
14. **Tang, C.S.K, & Wong C-Y (2003):** An outbreak severe acute respiratory syndrome: predictors of health behaviors and effect of community prevention measures in Hong Kong, China. *Am J Public Health*, 93:1887-8.
15. **Lau, T.J.F., Tsui, H.Y, &Griffiths, S., (2007):** Anticipated and current preventive behaviors in response to an anticipated human-to-human H5N1 epidemic in the Hong Kong Chinese general population. *BMC Infect Dis*, 7:18.
16. **Guidance for Responses to Influenza for Institutions of Higher Education during the 2009-2010:** Academic Year. Available at [<http://pandemicflu.gov/professional/school/higheredguidance.html>].
17. **Kristiansen, I.,S, Galvorsen, P.,A, & Gyrd-Hansen, D. (2007):** Influenza pandemic: perception of risk and individual precautions in a general population. Cross sectional study. *BMC Public Health*, 7:48.
18. **Kamate, S.,K, Agrawal, A, Chaudry, H, Singh, K., Mishra., P,& Asawa K (2010):** Public knowledge, attitude and behavioral changes in an Indian population during the influenza a (H1N1) outbreak. *J Infect Dev Ctries* 4(1):007-014.
19. **Paek, H.-J., Hilyard, K, Freimuth, V.S, Barge, J.K., & Mindlin, M, (2008):** Public support for government actions during influenza pandemic: lessons learned from a statewide survey. *Health Promot Pract*, 9:60S-72S.
20. **Gustafson, P.E., (1998):** Gender Differences in Risk Perception: Theoretical and Methodological Perspective. *Risk Anal* 18:805-11.
21. **Greenber, M.R.,& Schnieder, D.F., (1995):** Gender differences in risk perception: effects differ in stressed vs. non-stressed environments. *Risk Anal*,15:503-11.
22. **Jorgen, Vestbo., Finn, V. & Rasmussen, (1990):** Long-term exposure to cement dust and later hospitalization due to respiratory disease, *International Archives of Occupational and Environmental Health* Volume 62, Number 3, 217-220,
23. **Rubin, G.J, Amlot, R., Page, L.,& Weseley,S.,(2009):** Public perceptions, anxiety, and behavior change in relation to the swine influenza outbreak: cross sectional telephone survey. *BMJ*, 339:b2651
24. **Barr, M., Raphael, B., Taylor, M., Stevens, G., Jorm, L.,& Giffin, et al (2008):** Pandemic influenza in Australia: using telephone surveys to measure perceptions of threat and willingness to comply. *BMC Infect Dis*,8:117.
25. **Lau, J.T.F, Yeung, N.C.Y., Choi, K.C., Cheng, M.Y.M., Tsui, H.Y,& Griffiths, S., (2009):** Acceptibility of A/H1N1 vaccination during pandemic phase of influenza A/H1N1 in Hong Kong: population based cross sectional survey. *BMJ*, 339: b4164.
26. **Van, D, McLaws ML, Crimmins J, MacIntyre R, & Seale, H., (2010):** University life and Pandemic Influenza: Attitudes and intended behaviour of staff and students towards pandemic (H1N1) 2009. *BMC Public Health*, 10:130.
27. **Bell, D.M., (2006):** Non-pharmaceutical for pandemic influenza, international measures. *Emerging Infect Dis*, 12:81-87.
28. **Rabie, T., & Curtis V (2006):** Handwashing and Risk of Respiratory Infections:a quantitative systematic review. *Trop Med Health*, 11:258-267.
29. **Rayan, MAK, Christian, R.,S, & Wohlrabe., J.R., (2001):** Hand Washing And Respiratory Illness Among Young Adults in Military Training. *Am J Prev Med*, 21:79-83.
30. **Glass, L, & Glass R (2008):** Social Contact Networks for the Spread of Pandemic Influenza in Children and Teenagers. *BMC Public Health*, 8(1):61.
31. **Wu, JT, Riley, S, Fraser C,& Leung GM (2006):** Reducing The Impact of the Next Influenza Pandemic Using Household-Based Public Health Interventions. *PloS Med*, 3(9):e361.
32. **Boyce, GM, & Pittet D (2002):** Guideline for Hand Hygiene in Health-Care Settings: recommendations of the Healthcare Infection Control Practices advisory Committee and the HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force.*Infect Control Hosp Epidemiol*, 23:S3-S40.
33. **Morrison GL, & Yardley, L., (2009):** What Infection Control Measures will People Carry out to reduce Transmission of Pandemic Influenza? A focus group study. *BMC Public Health*, 9:258.
34. **Kilbourne, E., D., (2006):** Influenza Pandemics of the 20th Century. *Emerging Infect Dis*, 12:9-14.
35. **Akan et al. (2010)** Knowledge and attitudes of university students toward endemic influenza: a cross-sectional study from Turkey, *BMC Public Health*, <http://www.biomedcentral.com/1471-2458/10/413>.

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