Original Article

Knowledge, beliefs and preventive behaviors regarding Influenza A in students: a test of the health belief model

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ABSTRACT

Background: The higher prevalence rate of influenza A among adolescence emphasizes the importance of preventative strategies among this age group of population. The aim of this study was to evaluate the preventive behaviors of high school students regarding type A influenza, in Shahrekord, Iran. **Materials and Methods:** In this cross-sectional study, 313 high school students were enrolled. Preventive behaviors of influenza A was evaluated by components of the Health Belief Model (HBM), using a questionnaire which its reliability was verified through a pilot study (alpha score 0.8). Data analysis was done by descriptive statistics, independent t-test and Pearson correlation coefficient. **Findings:** Mean age of the students was 16.31 years. Knowledge, perceived severity and perceived barriers were in the modest level among the students. The highest scores were related to perceived susceptibility (75.4%) and perceived benefit (55.6%). Mass media was the main source of their information regarding influenza A. **Conclusion:** Considering the findings of this study and the relation between HBM components and the preventive behaviors of students, it seems that using HBM could be useful in improving preventive behaviors of influenza A among the studied population.

Key words: Health belief model, influenza A, preventive behaviors, student

INTRODUCTION

Type A flu is an influenza virus. This new virus was first reported in Mexico in 2009. Other countries have reported cases of infection with this new virus. Similar to other ordinary seasonal flu, it spreads from human to human.[1]

Not following the health principals of the disease, the new influenza can lead to infection of many people in a short term, and this epidemic would have many social, economical and health consequences. In 2009, the World Health Organization reported a probable pandemic occurrence in phase six and global spread of type A influenza i.e. H1N1.[2,3]

Important feature of this disease are that it is a very rapid spread through contaminated particles suspended in the air or settle on surfaces or objects in a moist environment that indicates the necessity of individual and social health care more than ever.[4,5] The other point about the importance of health and disease is the fact that now more than forty years after the 1976, pandemic virus remains active and is ongoing. Although avian A influenza virus (H5N1) has been stopped in the third pandemic phase, it still continues to operate its virulence pathogenicity in birds and humans, and likelihood of this virus simultaneous with one of the two new human seasonal flu viruses is more than any other time which cause high virulence and emerging unprecedented and lethal viral genetic changes.[6]

The most cases of human diseases caused by virus A (H1N1) occurred among young adults, so that in Japan, approximately 80 % of disease cases reported at 10-19 years of age.[7]

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In addition, most of disease cases in Philippine occurred at 5-24 years of age, and in England it was almost in 20-year-old people.[8] Given to human density more than 15 million people in schools, prediction of planning and readiness to cope with this outburst crisis is of national properties and necessities. The necessity of preventive behaviors in schools has been of special attention since the beginning of the epidemic disease.[2,6]

Selection of a model for health education is the first step in assessment process of any educational program. Health belief model (HBM) is one of the earliest theories of health behavior and the first models in which the theories of behavioral sciences were used to solve health issues. This model has been used nearly half a century with great success in a variety of health issues. It is a comprehensive model more is for disease prevention and showed the relationship between beliefs and behavior and is based on the theory that preventive behaviors based on personal beliefs include individual susceptibility toward disease, effect of disease occurrence on individual's life and impact of health measures to reduce disease's severity and susceptibility.[9]

The health belief model constructions include perceived susceptibility, perceived benefits, cues to action, perceived severity, perceived barriers and self efficacy.[9] According to this model, in order to adopt preventive behaviors of the new flu, first, individuals should feel the risk (perceived susceptibility), then understand the depth of this risk and also seriousness of the complications (perceived severity), through the positive signs they receive from their environment (cues of action), believe in applicability and usefulness of preventive behaviors (perceived benefits), and believe that the preventive actions for these behaviors are less expensive than its benefits (perceived barriers) and consider themselves as capable people to implement preventive behaviors (self efficacy), so that finally they can implement and take an action on the prevention of type A influenza.

Given to the above mentioned points, the researchers decided to determine the level of information, beliefs and performance related to the new influenza in students of Shahrekord, Iran by the use of HBM so that accordingly they can develop an appropriate educational planning about this disease and similar cases.

MATERIALS AND METHODS

This was a descriptive cross-sectional study in which 313 students (150 girls and 163 boys) were studied from high school of Shahrekord, Iran. Sampling conducted through multistage method based on which the two areas of each Education Departments were randomly selected (in order to control gender factor, it was done as a boy school and a girl school); thereafter, the students of mathematics, sciences and humanities were selected randomly in each school. Full willingness of students to participate in the study was one of the major criteria to enroll and unwillingness of students in each stage could exclude them form the study.

Due to lack of valid instrument in this subject, a researcher-made questionnaire was used to do so which was designed through a pilot study. Content and face validity of the questionnaire qualitatively were provided through scientific comments of relevant professors and literature review and considering all the dimensions of the subject. The reliability was measured through test re-test and internal consistency ($\alpha = 0.8$) and the questionnaire was used after ensuring about its validity and reliability.

The questionnaire consisted of five parts; the first part with eight questions about demographic characteristics, the second part with 10 questions about assessment of students' awareness and knowledge through multiple-choice answers related to information about the cause of disease, transmission ways, complications and symptoms, those at the risk and effective preventive measures. The third part was related to attitude assessment (according to Likert scale) with 23 questions based on structures of HBM about perceived susceptibility, severity and attitude toward perceived benefits and barriers and also individual's self-efficacy to adopt preventive behaviors about type A influenza with five-choice answers (completely disagree, disagree, no comment, agree, completely agree) and each phrase had a score between one to five. The minimum and maximum scores for perceived susceptibility were 6 and 30, for perceived severity 3 and 15, for perceived benefits 5 and 25, for perceived barriers 4 and 20 and for self-efficacy were 5 and 25; respectively.

The fourth part was related to evaluation of activities in order to prevent from the disease and spread of influenza including six activities as 4-choice answers (never, sometimes, often, always) and each phrase had a score between 1 to 4 (i.e. the minimum and maximum scores were 6 and 24 respectively). In terms of knowledge, the structures of the model and students' performance were scored based on total 100 and their scoring was as poor (0 to 33), moderate (33-66) and high (66-100).

The fifth part consisted of available information resources for students about type A influenza with seven choices and they could choose one or more than one answers.

The data were collected during a month in October 2009. In order to collect data, first necessary coordination with offices of the districts was done through the Education Department. Thereafter, the interviewers presented in schools and explained study objectives and the point that this project would be analyzed as a group and also would be used to prevent from disease; then they tried to draw their motivation to participate in the study. Data analysis was done through Software SPSS version 15 by descriptive statistics, independent t-test and Pearson correlation coefficient. $\alpha = 0.05$ was considered as a significant level for all the tests.

RESULTS

Mean age of students was 16.31 ± 1.17 years with minimum

and maximum 14 and 20 years. Out of 313 participants, there were 150 girls (47.9%) and 163 boys (52.1%) studying in mathematics, sciences and humanities course of studies. The education of students' parents was similar mostly as high school graduates. Their mothers were mostly housekeepers (89.5%) and fathers were self-employed.

Knowledge and awareness of most of students (71.2%) was average [Table 1]. Moreover, female students had a higher score of knowledge than male students and independent t-test showed a significant difference ($P = 0.009$). Among the entire respondents, 32.3% mentioned virus as the cause of influenza; 75.1% mentioned the major influenza spread way through person to person contact; 36.4% believed the prevalence of type A influenza is extremely high; 76.7% believed the best way to prevent influenza is to follow personal hygiene and only 15% of the participants noted that age range of 5-25 is the age group with highest cases of disease.

Students' perceived susceptibility (75.4%) about type A influenza was in a high level; thus 44.1% of the study subjects thought they were at the risk of type A influenza. 78.9% of them noted the cause of their disease due to contact with diseased individuals and 52.7% were concerned about the outbreak incidence of type A influenza. However, in terms of perceived severity about type A influenza, the situation was different; thus, 79.6% were at a moderate level and 20.4% were at a poor level. Meanwhile, 72.8% of the students noted that the power of type A influenza contagion is very high in the society and 69.3% believed type A influenza has many social, economic and health complications and 76.7% of them announced that it can cause mortality in diseased people.

Perceived benefits about preventive behaviors from type A influenza was in a high level. 73.8% of the students believed avoiding from direct contact with the diseased and sick people can prevent from influenza and 77.4% noted its prevention by frequent washing hands with soap and water.

Perceived barriers for adopting preventive behaviors was in a moderate level. 65% of the students announced that prevention from type A influenza requires much effort and 32.5% believed observing health and hygiene issues is very time consuming and difficult; but only 19.8% noted frequent washing hands with soap and water.

Self efficacy of the students was in a high level; thus, 65.5% of them believed they are able not to go to crowded places and 69.7% announced they can avoid kissing and shaking hands (in greeting) to prevent from the disease. 76% believed they can be away from diseased people and 77.9% announced they are able to wash their hands regularly with soap and water.

Self-report behaviors about type A influenza in students was in a high level; thus, 80.6% of the students regularly used to wash their hands and 60.4% of them avoided from direct contact with diseased people or those suspected to be diseased. Moreover, in direct contacts, 55% of the students kept a one-meter distance with suspected people. Despite avoiding from kissing face and shaking hand, only 30.7% of the students always observed this behavior.

Among the HBM factors and students' performance about preventive behaviors from type A influenza, there was a significant difference only between perceived benefits and self-efficacy of the male and female students [Table 1].

Pearson correlation coefficient test showed that students' performance about preventive behaviors has a significant correlation with all the components of HBM except perceived barriers so that mean score of behaviors had the highest correlation with self-efficacy ($r = 0.50$) and lowest correlation with perceived susceptibility ($r = 0.27$) [Table 2].

Among the study subjects, 10.2% obtained no information about type A influenza and among 89.8% of the participants, the most important sources of information were TV (71.9%) and published printed sources (30.7%) [Table 3].

DISCUSSION

Influenza is one of the known viral diseases in the history caused the death of many people around the world through its contagion outbreaks, outburst and sporadic cases. The present study aimed to evaluate preventive behaviors from spread of type A influenza based on HBM.

Table 1: Comparing mean score of knowledge, HBM variables and students' performance in both sexes

Variable	Gender of students				*t*-test	*P* Value
	Male ($n = 163$)		Female ($n = 150$)			
	Mean	SD	Mean	SD		
Knowledge	46.01	16.31	50.8	15.86	2.62	0.009*
Perceived susceptibility	72.58	11.87	73.96	13.41	0.96	0.33
Perceived severity	37.73	9.31	39.88	8.29	2.15	0.03*
Perceived benefits	62.22	12.42	67.17	12.5	3.51	0.001*
Perceived barriers	39.18	9.33	40.00	10.61	0.72	0.46
Self-efficacy	61.96	14.17	65.24	14.5	2.02	0.04*
Performance	74.15	18.73	77.66	15.54	1.7	0.08

*Statistical significant difference

Table 2: Correlation between Health Belief Model components with students' performance about preventive behaviors from type A influenza

Variable Performance	knowledge	Perceived susceptibility	Perceived severity	Perceived benefits	Perceived barriers	Self-efficacy
Correlation Coefficient	0.38	0.274	0.314	0.356	0.056	0.506
P Value	0.501	< 0.001	<0.001	<0.001	0.322	<0.001

Table 3: Frequency distribution of information resources in the study population

Variety of information sources	Number (%)
Family member	88 (28.1)
Friends and relatives	95 (30.4)
Posters and print resources	96 (30.7)
TV and Radio	225 (71.9)
Health care staff	69 (22)

Mean score of awareness and knowledge in the present study was average. It seems that low awareness of students were from cases such as causes of disease outbreak, unawareness of being in an at risk age group and importantly person to person contact as the main ways of disease transmission and of the considerable points in the study. In a study Khan *et al.* conducted on new arrival students about knowledge toward avian influenza, only 36% of the students were informed about common disease between human and birds and 35% of them were familiar with its symptoms; however, 70% of the students noted that virus is the pathogen of disease.[10] Moreover, Leslie *et al.* in a study about knowledge of Afghani people about avian influenza, they showed that the knowledge of the public was in a low level; however, it was moderate in the studied camps with educational facilities for the residents.[11]

The study results showed that perceived susceptibility of most of students in this study was in a high level about type A influenza. This indicates that students knew they were at the risk of disease and they were sensitive toward influenza, and if students accept that they are sensitive toward influenza and they may suffer from it, they would adopt preventive behaviors, and given to high level of perceived benefits in students, it indicates that these behaviors were useful and applicable.

Mean score of self efficacy in students about preventive behaviors was higher than other components of HBM and it indicated high perceived capacity of students for successful implementation of preventive behaviors; moreover, students' performance also had the highest correlation with this variable.

The perceived severity which means students feel threatened by type A influenza was in an average level. Moreover, perceived barriers were in an average level, which are as negative perceived aspects of adopting preventive behaviors. The study results showed that students' performance about preventive behaviors was in a proper level; in addition, all the variables of the HBM -except perceived barriers- had a significant correlation with students' performance which this case was also proved in other studies based on HBM.[12,13]

In this study, there was a significant difference between mean score of perceived severity, perceived barriers and self-efficacy of students in both sexes; in the study of Al Shehri *et al.* also female students were more concern about the outbreak of avian influenza than male students.[14] Di Giuseppe *et al.* in Italy reported that a high percentage of people were uninformed about the risk of avian influenza; moreover, only 26.9% of the study subjects used to wash their hands or used gloves before and after touching the raw meat.[15]

The study of Xiang *et al.* reported that concern of Chinese rural and urban people is in a moderate level so that there was a significant difference between the two studied districts. In their studies, the performance of the participants was appropriate about washing hands in order to prevent from avian influenza and a significant percentage of people -even in villages- washed their hands well.[16]

Today health-care issues are a major part of mass media information. In 1990, at least a quarter of articles and newspaper contents in the U.S. were assigned to health related issues.[17] In local TV news in the U.S., health related issues were one of the five common subjects.[18] Another study on medias of the U.S. showed that over 17 television commercial ads in hours are associated with health issues.[19] Emphasis of mass media, particularly TV, on health issues has caused that people received a considerable amount of their information fro these media. In the present study, TV also was introduced as the most important factors in obtaining information. In similar cases and other unprecedented emerging disease, many studies have pointed out to the important role of mass media including television and print sources like newspapers and magazines and were in accordance with the results of the present study. For example, in the study of Al Shehri *et al.* 70% of the participants introduced mass media as their information source [14] and in the study of Khan *et al.* also 70% of them noted TV and 51% noted newspaper as their information sources about avian influenza.[10] In the study of Xiang *et al.* also TV, newspaper and internet were respectively noted as the most important sources of information.[16] A study done in Thailand can confirm all these results in which TV was introduced as the most efficient source of information.[19]

Similar to many studies, the present study also had some limitations. Low study sample size to some extent reduced the generalization and reliability of the study; moreover, lack of seriousness of the students for participation in the study was one of the other problems to conduct the study.

Finally, given to the results of the study about the correlation of HBM components with students' performance, it seems that by providing necessary trainings and educations about the disease and more emphasis on exposure of students and establishing self efficacy in implementation of preventive behaviors, we can expect improvement of students' performance concerning these behaviors.

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