

NURSING INTERVENTION PROGRAM TO PREVENT PANDEMIC INFLUENZA TRANSMISSION: EFFECT ON STUDENT'S PRACTICES

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Abstract: Although influenza is a preventable disease it is also a highly contagious disease that can cause high mortality and morbidity even between pandemics. As influenza can spread rapidly and easily, it can cause many cases and deaths not only due to the disease, but also due to its associated complications. So implementing nursing intervention program for educating specific practices for prevention of pandemic influenza transmission for school students is very important especially when there is a major public health threat like influenza pandemic. **Aim of this study:** This study was aiming to assess student's practices regarding prevention of pandemic influenza transmission. It also aims to design, implement and evaluate nursing intervention program for students about practices for prevention of pandemic influenza transmission. **Research question:** What is the effect of nursing intervention program on student's practices about prevention of pandemic influenza transmission? **Research design:** A quasi experimental design was used in this study. **Setting:** The study was conducted in governmental schools in Ismailia governorate. **Subject:** The study involved 204 students from 12-18 years. **Tools of data collection:** Data were collected using interview questionnaire sheet and observational checklists. **Results:** Total score of practices regarding prevention of pandemic influenza transmission were improved after implementation of the nursing intervention program and after one month later. As satisfactory practices represented by 100% post nursing intervention program and 99.5% after one month. **Recommendation:** The study recommended implementation of many nursing intervention programs for prevention of influenza transmission.

Keywords: Influenza, Nursing intervention program, Pandemic, prevention, students.

1. INTRODUCTION

Influenza viruses are among the most common causes of human respiratory infections, because they cause high morbidity and mortality. Viruses cause both seasonal, endemic infections and periodic, unpredictable pandemics. Up to 50% of the population can be infected in a single pandemic year and the number of deaths caused by influenza can dramatically exceed what is normally expected. (1)

In the United States, approximately 25 percent of the population has flu-associated illness annually, leading to an average of 20,000 to 40,000 deaths per year. Transmission of influenza occurs through inhalation of a respiratory droplet from an infected person or by indirect contact with a contaminated object, such as drinking cups or other items contaminated with respiratory secretions. The influenza virus then invades the epithelium of the respiratory tract, causing inflammation and desquamation. (2)

Children serve as a major vector because of their own high rates of contractility, they shed virus at higher rates and for longer periods of time than adults (3). Furthermore, (4) added that, children are mostly at risk for avian influenza infection because they like to play with birds or animals. Children are not always careful about what they touch and not conscious about hygiene. During epidemics, infection among students is believed to be a major source of transmission of influenza in the community, to prevent the transmission of infection, respiratory hygiene or cough control measures should be implemented at the first point of contact with a potentially infected child. These measures should be incorporated into infection control practices as one component of standard precautions (5).

The Center of Disease Control and prevention (CDC) recommends everyday preventive actions to slow the spread of germs that cause respiratory (nose, throat and lungs) illnesses, like flu (6). So children should be taught good hand washing, use a tissue or their hands to cover their nose and mouth when cough or sneeze and to dispose of tissues properly, as well as to wash their hands. In addition, used tissue should be immediately thrown into the wastebasket. Children with respiratory infections should not share drinking cups, washcloth or towels with the other children (7)

Nowadays there is an increase in the prevalence of influenza among school students. Schools considered social environment in which students learn new behaviors, as education is an important role of pediatric nurse, so implementing an nursing intervention program for hygienic practices and prevention and control of transmission of influenza in schools is very important especially when there is a major public health threat like influenza pandemic.(8)

This study was conducted to shed light on the effectiveness of nursing intervention program on student's practices regarding prevention and control of pandemic influenza transmission.

This study is aiming to:

- 1- Assess student's practices regarding prevention of pandemic influenza transmission.
- 2- Design, implement and evaluate nursing intervention program for students about practices for prevention of pandemic influenza transmission.

Research Questions:

- 1- What are the practices of students regarding prevention of pandemic influenza transmission?
- 2- What is the effect of an nursing intervention program on student's practices about prevention and control of pandemic influenza transmission?

2. SUBJECTS AND METHODS

- **Study Design**

A quasi experimental design was used in this study.

- **Study Settings**

The present study was conducted at preparatory and secondary schools from both rural and urban areas in Ismailia Governorate.

- **Study Population:**

204 students of preparatory and secondary schools from 12-18 years.

- **Method of Sampling:**

A multi stage random sampling was utilized in this study. This process consisted of several steps. Firstly, random selection of three nursing intervention administrations from a total of seven administrations all over Ismailia governorate. Then random selection of four schools, where two schools from rural areas and two schools from urban areas. Lastly, random selection of students from each school.

- **Sample Size**

204 students and was calculated according to the following equation :

$$n = Z^2 \cdot P(1-P) / D^2$$

In which:

P = True proportion of factor in the population (guess) = 50

D = Maximum difference between sample mean and population mean = 75

Z = Area under normal curve corresponding to the desired confidence level = 1.96

After Calculation: $n = Z^2 \cdot P(1-P) / D^2 = 9411.92$

Sample Size = $n / (1 + (n/\text{population})) = 204$ cases

- **Tools of data collection**

Data were collected through using two tools as the following:

Tool 1: Interview questionnaire sheet

To collect data about socio-demographic data of the studied students such as age, gender, residence, academic year and name of the school.

Tool 2: Observational Checklists

Observational checklists were adopted by the researcher after reviewing the relevant literatures and modified to suit the nature of the study. Then the modified tools were subjected to jury for evaluating its validity and feasibility. The researcher assesses the student's actual practice for prevention and control of pandemic influenza transmission. It composed of 3 procedures covering the following areas: 1- Hand washing (5 items). 2- Cleaning hands with alcohol hand rub (3 items). 3- Wearing face mask (3 items). (9-14)

Administration and ethical Considerations:

Purpose and expected outcomes of the study were explained to each study subject. They were secured that all the gathered data will be used for the research purpose only, the study is harmless and their approval to participate is a prerequisite to be included in the study. Each subject was assured that they can quit/withdraw whenever they want.

- **Pilot Study**

The pilot study was carried out after the development of the tool and before starting the data collection in order to test the clarity, feasibility, applicability and time required. It is carried out on 10% of the total sample size. Those included in the pilot study were excluded later from the sample.

- **Field Work**

The researcher was available daily by rotation from the beginning to the end of the school day. The work was organized among schools by co-operation and communication with school nurses. The aim of the study was explained by the researcher to the studied students in order to get their oral approval to be included in the study. Students were divided into groups (4 groups) in each school, and asked to fill the part concerned with sociodemographic data. After that each student demonstrated the three procedures at the pre-test, then the program was carried out by the researcher from middle of February to the last of March. The program given in 3 sessions for each group, every session lasted from 30-45 minutes. The sessions done using real materials and supplies, hand washing done in places where water is available as labs, school clinics.

At the end of the sessions the study tool were reused again and procedures re-demonstrated by the same students for post-test and assessment. After one month from post-test the same students were met again to fill the same study tool and procedures re-demonstrated by the same students (follow up evaluation) for the purpose of follow up the effect of the program.

- **Statistical design:** Upon completion of data collection, the gathered data were organized and coded. The data were then imported into Statistical Package for the Social Sciences (SPSS version 18) software for statistical analysis using personal computer.

3. RESULTS

The sociodemographic characteristics of the studied sample (**table 1**) showed that, almost two thirds of the studied sample (63.2%) their ages ranged between 14 to 16 years old. While the minority of them (10.8%) their ages ranged between 16 to 18 years old. Less than three quarters of the studied sample (71.6%) were girls. Almost half of the studied sample (48.5%) were in the first year of secondary school and 31.9% were in the 2nd preparatory. More than two thirds of the studied sample (68.6%) lives in rural areas. While 31.4% live in urban areas.

Table (2) demonstrates that, only 1%, 4.9% and 29.4% of the studied sample demonstrated complete correct actual practice pre nursing intervention program. Compared with 82.4%, 87.3% and 90.2% post nursing intervention program and 81.9%, 83.8% and 87.7% at the follow up, with very high statistical significant difference pre/post nursing intervention program.

Table (3) deals with using alcohol- based hand cleaners and there is very high statistically significant difference in the studied sample's actual practices in protection from influenza pre/post nursing intervention program. Concerning rub hands with alcohol, less than one fifth of the studied sample (18.1%) demonstrated complete correct practice pre nursing intervention program. Compared with the vast majority (99.5% and 98.5%) post nursing intervention program and at follow up. Regarding keep rubbing hand till complete dryness only 6.9% of the studied sample demonstrated complete correct practice pre nursing intervention program, compared with 92.2% and 87.3% respectively post nursing intervention program and at follow up.

Table (4) clarifies that, almost half of the studied sample (52%) demonstrated complete correct actual practice regarding to wear mask to cover mouth and nose pre nursing intervention program, compared with 99.5% post nursing intervention program and at follow up. Concerning ting the mask behind head, almost one fifth (21.1%) of the studied sample demonstrated complete correct actual practice pre nursing intervention program, compared with 99% and 99.5% post nursing intervention program and at follow up. Concerning change mask when torn or wet, only 1% of the studied sample demonstrated complete correct actual practice pre nursing intervention program, compared with 64.2% and 66.7% post nursing intervention program and at follow up, with very high statistical significant difference pre/post nursing intervention program.

Figure (1) shows that, there is very high statistically significant difference pre/post nursing intervention program regarding total actual practices of studied the sample, where pre nursing intervention program 79.4% of the studied sample had total satisfactory level of actual practice, compared with 100% and 99.5% post nursing intervention program and at the follow up respectively.

Table (1): Sociodemographic characteristics of the studied sample

Personal characteristics	Studied students (n=204)	
	No.	%
Age (years)		
• 12-	53	26.0
• 14-	129	63.2
• 16-≤18	22	10.8
Gender		
• Male	58	28.4
• Female	146	71.6
Academic year		
• 1 st preparatory	13	6.4
• 2 nd preparatory	65	31.9
• 3 rd preparatory	27	13.2
• 1 st secondary	99	48.5
Residence		
• Rural	140	68.6
• Urban	64	31.4

Table (2): Distribution of the studied sample according to their actual practice in prevention and control of influenza pandemics regarding to hand washing (n=204).

Steps of hand washing procedure	Pre Nursing intervention Program		Post Nursing intervention Program				Significance
			Immediately		Follow up		
	No.	%	No.	%	No.	%	
Wet hands:							
Incorrect (0)	33	16.2	1	0.5	3	1.5	MC _P <0.0001***
Incomplete correct (1)	42	20.6	1	0.5	2	1.0	
Complete correct (2)	129	63.2	202	99.0	199	97.5	
Use enough amount of soap to make lather:							
Incomplete correct (1)	79	38.7	1	0.5	3	1.5	X ² =165.4 P<0.0001***
Complete correct (2)	125	61.3	203	99.5	201	98.5	
Wash hands for at least 20 seconds:							
Incorrect (0)	1	0.5	0	0.0	0	0.0	MC _P <0.0001***
Incomplete correct (1)	201	98.5	36	17.6	37	18.1	
Complete correct (2)	2	1.0	168	82.4	167	81.9	
Rinse hands with water:							
Incorrect (0)	1	0.5	0	0.0	0	0.0	MC _P <0.0001***
Incomplete correct (1)	193	94.6	26	12.7	33	16.2	
Complete correct (2)	10	4.9	178	87.3	171	83.8	
Dry hands well and between fingers:							
Incorrect (0)	39	19.1	0	0.0	1	0.5	MC _P <0.0001***
Incomplete correct (1)	105	51.5	20	9.8	24	11.8	
Complete correct (2)	60	29.4	184	90.2	179	87.7	

MC_P: Monte Carlo test

*** Very high statistical significant difference (significant at P<0.05)

Table (3): Distribution of the studied sample according to their actual practice in prevention and control of influenza pandemics regarding to alcohol-based hand cleaners (n=240).

Steps of using alcohol based hand cleaners	Pre Nursing intervention Program		Post Nursing intervention Program				Significance
			Immediately		Follow up		
	No.	%	No.	%	No.	%	
Use appropriate amount of alcohol on palms of hands:							
Incorrect (0)	1	0.5	1	0.5	1	0.5	MC _P <0.0001***
Incomplete correct (1)	41	20.1	0	0.0	1	0.5	
Complete correct (2)	162	79.4	203	99.5	202	99.0	
Rub hands with alcohol:							
Incorrect (0)	1	0.5	0	0.0	0	0.0	MC _P <0.0001***
Incomplete correct (1)	166	81.4	1	0.5	3	1.5	
Complete correct (2)	37	18.1	203	99.5	201	98.5	
Keep rubbing hands till complete dryness:							
Incorrect (0)	38	18.6	0	0.0	1	0.5	X ² =402.7 P<0.0001***
Incomplete correct (1)	152	74.5	16	7.8	25	12.3	
Complete correct (2)	14	6.9	188	92.2	178	87.3	

MC_P: Monte Carlo test

*** Very high statistical significant difference (significant at P<0.05)

Table (4): Distribution of the studied sample according to their actual practice in prevention and control of influenza pandemics regarding to wearing face mask (n=204).

Steps of wearing face mask	Pre Nursing intervention Program		Post Nursing intervention Program				Significance
	No	%	Immediately		Follow up		
			No	%	No	%	
Wear mask to cover mouth and nose:							$MC P < 0.0001^{***}$
Incorrect (0)	1	0.5	0	0.0	0	0.0	
Incomplete correct (1)	96	47.1	1	0.5	1	0.5	
Complete correct (2)	106	52.0	203	99.5	203	99.5	
Tie the mask behind head:							$MC P < 0.0001^{***}$
Incorrect (0)	5	2.5	0	0.0	0	0.0	
Incomplete correct (1)	156	76.5	2	1.0	1	0.5	
Complete correct (2)	43	21.1	202	99.0	203	99.5	
Change mask when torn or wet:							$X^2=466.4$ $P < 0.0001^{***}$
Incorrect (0)	169	82.8	1	0.5	3	1.5	
Incomplete correct (1)	33	16.2	72	35.3	65	31.9	
Complete correct (2)	2	1.0	131	64.2	136	66.7	

$MC P$: Monte Carlo test

*** Very high statistical significant difference (significant at $P \leq 0.05$)

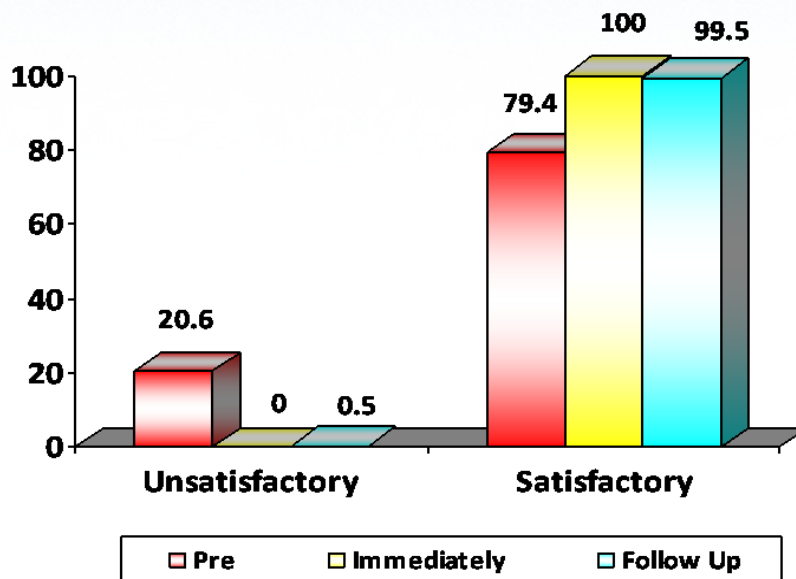


Figure (1): Total level of actual practice of studied sample pre/post nursing intervention program regarding to prevention and control of influenza pandemics (n=204).

4. DISCUSSION

The recent spread of novel H5N1 and H1N1 influenza in schools has raised the interest in improving the preparation for protection against these influenza viruses. It can be achieved through development of nursing intervention program for improving students' practices and knowledge about prevention and control of this disease (15). School-based interventions targeting the hygienic practices of the students is very important for prevention and control of influenza pandemics (16)

Almost two thirds of the studied sample their ages ranged between 14 to 16 years old. Less than two thirds of them were girls and almost half of the studied sample were in the first year of secondary school .

As regards hand washing, the vast majority of the studied sample washing their hands correctly to protect themselves from influenza post program (Table, 1). These post program results are in concordant with (17), whom studied promotion of knowledge, attitude and practice towards swine flu A/H1N1; an intervention study on secondary students of Menofia governorate, Egypt and (18), whom studied knowledge and awareness of preventive measures in influenza H1N1 infection among Students of University of Sri Jayewardenepura and found that, the studied sample considered hand washing as simple and effective way to control influenza .

In relation to wearing face mask to control of influenza (table, 3), it was clear that, only less than one fifth of the studied sample reported that, there is need to wear face mask pre nursing intervention program. This finding is supported by(17,18), whom found that, less than one fifth of the studied sample necessitate wearing masks to control influenza transmission. From the researcher point of view adherence to face mask usage might be a problem in our communities as it is not a common practice and wearing face mask can be seen something strange.

As regards total level of satisfactory actual practices of the studied sample, almost four fifths of them showed satisfactory results pre-program, compared with hundred percent post program (Figure, 1). From the researcher's point of view in each procedure there is some items with little difference pre/post results which lead to increase the total level of actual practices. The study of(19), who studied the assessment of student's awareness about influenza A/ H1N1 in the secondary schools of girls at Benha city showed that, less than two thirds of the studied sample had satisfactory total practices regarding influenza. This result supported by(17), whom found that, there is statistical significant increase in the level of good knowledge and healthy practice after implementation of health nursing intervention program. This strategy of education was also successful in raising the knowledge about transmission and prevention of infection, improving the risk perception and increasing compliance to practicing universal and safety precaution.

In relation to the studied sample's practices of all procedures (hand washing, cleaning hands with alcohol based sanitizers and wearing face mask, tables 1, 2 and 3). There was significant increase in the studied sample's performance in all skills pre/post nursing intervention program. From the researcher's point of view the students became aware that these procedures are simple and important in prevention and control of pandemic influenza .

5. CONCLUSION

In the light of the current study, it can be concluded that, the nursing intervention program provided for preparatory and secondary students improved significantly the practices of students regarding prevention and control of pandemic influenza transmission .

6. RECOMMENDATIONS

In the light of the findings of the current study the following recommendations are suggested :

Correction of misconceptions and improving student's practice related to control of pandemics through posters in schools and through media for students and their families .

Implement further nursing intervention programs to improve practices about prevention and control of pandemics among other schools .

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