

Effectiveness of Planned Teaching Guidelines on Nursing Students Regarding Middle East Respiratory Syndrome

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Abstract:

Background: Middle East Respiratory Syndrome is a serious and growing threat to communities around the world. A high proportion of people who affected by the virus were; health care workers, patients who admitted to hospital for other reasons and visitors of patients.

Aim of the study: To evaluate the effectiveness of planned teaching guidelines on nursing students regarding Middle East Respiratory Syndrome (MERS).

Research design: Quasi experimental design was used.

Setting: The study was conducted at college of nursing and allied health sciences, Jazan University, KSA..

Sample: Convenience sample consisted of 78 students from level (5).

Tools of data collection: An interviewing questionnaire about Socio Demographic characteristics of the students & previous source of information on MERS. Also Self-administered knowledge questionnaire on MERS contains 16 multiple choice questions.

Results: Majority of the studied subjects was single and their mean age was 21.24 ± 0.996 . Regarding the pretest majority of subjects have given incorrect answers to all the items of questionnaire except body system affected by MERS (77%). However in posttest more than half of the subjects given correct answers to most of the items but nearly one third of subjects remained with incorrect answers in regard to confirmatory test for diagnosis (37%), vaccine availability (42%), preventive measures to health care personnel (33%) and period recommended for contact tracing (36%). Most of them who had inadequate knowledge (76.9%) in pretest demonstrated moderately adequate knowledge (67.9%) in posttest. Mean posttest knowledge score (10.28 ± 1.851) of subjects was higher as compared to pretest knowledge score (4.91 ± 3.033) which had a statistical significance ($p < 0.001$).

Conclusion: From the current study results it was concluded that mean posttest knowledge score was higher significantly than the mean pretest knowledge score on MERS among the studied subjects so the first research hypothesis was accepted but the second research hypothesis was rejected because no significant association found between pretest level of knowledge of subjects with their age and marital status.

Recommendations: Based on the study results continuous health education programs are necessary to all students in health field to improve their knowledge and practices about prevention and control of Middle East Respiratory syndrome (MERS). Also more researches are needed to identify more information about MERS, methods of transmission and preventive measures.

Keywords: Planned teaching guidelines, Middle East Respiratory Syndrome and nursing students.

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I. Introduction:

Middle East Respiratory Syndrome-coronavirus (MERS-CoV) is a global health problem caused by a coronavirus that was first identified in Saudi Arabia. Coronaviruses are a large family of viruses that can cause diseases in humans; ranging from the common cold to severe acute respiratory syndrome [1]. A typical presentation of the disease includes fever, cough, shortness of breath may be occurs, pneumonia is common, diarrhea, in severe cases patients may suffer from respiratory failure, some people infected with MERS virus have been reported to be asymptomatic and some patients have had organ failure[2]. The virus appears to cause more severe disease in people with immune system problems; as older people; infant/ children; pregnant women and people have chronic diseases as diabetes, cancer and chronic lung disease. Approximately 80% of human cases reported by the King Saudi Arabia. The duration of infectivity is also unknown, so it is unclear how long people must be isolated but current recommendations are for 24 hours after resolution of symptoms [3,4].

In September 2012, a novel coronavirus infection was reported, the virus was isolated from the sputum of a man in Jeddah, Saudi Arabia, in June 2012. Shortly thereafter, a report appeared of an almost identical virus detected in a patient in Qatar with acute respiratory syndrome and acute kidney injury; the patient had traveled recently to Saudi Arabia [5]. There was a rapid international response following the news of the virus. An interim case definition was developed rapidly by WHO to ensure that a systematic approach is followed for appropriate identification and investigation of suspected cases [6]. At April 16, 2015 about 1106 laboratory-confirmed cases have been reported to WHO including cases from different countries worldwide; 10 countries from Middle East, 2 from Africa, 8 from Europe, 2 from Asia and the USA. About 63.5% of reported cases were males, the median age was 48 years (range 9 months to 99 years) and about 3 to 4 out of every 10 patients reported have died [7]. The clinical spectrum of MERS-CoV infection ranges from asymptomatic, or mild respiratory symptoms to severe acute respiratory disease and death. Approximately 36% of reported patients with MERS-CoV have died. The virus causes more severe disease in older people, people with poor immune systems, and chronic ill patients and cancer patients [8].

MERS-CoV is a zoonotic virus that is transmitted from animals to humans. The origins of the virus are not fully understood, it is believed that it originated in bats and was transmitted to camels sometime in the distant past. The route of transmission from animals to humans is not fully understood, but camels are likely to be a major reservoir host for MERS-CoV and an animal source of infection in humans. The virus does not appear to pass easily from person to person unless there is close contact, such as providing unprotected care to an infected patient. There have been clusters of cases in healthcare facilities, where human-to-human transmission appears to be more probable, especially when infection prevention and control practices are inadequate [9]. Medical care may be needed to take care of the symptoms of the disease such as hand washing with soap and water, cover the nose and mouth with a tissue when cough and sneeze, avoid close contact as kissing, sharing cups or eating utensils with sick people and clean & disinfect frequently touched surface such as toys and doorknobs [10].

Health care workers should be educated, trained and encouraged to practice skills that aid in infection prevention & control. It is not always possible to identify patients with MERS-CoV early because some have mild or unusual symptoms. For this reason it is important that health care workers apply standard precautions consistently with all patients- regardless of their diagnosis in all work practices all the time [11]. Nurses play an important role in the disease preventive measures and health education to infected person about isolation, wear face mask, avoid use public transportation, use separate room and bath if it is available, avoid sharing household items and hand washing is very important [12]. Also all health care facilities should have standard infection prevention and control practices in place. It is also important to investigate the travel history of people with respiratory infection to determine if they have recently visited countries with acute MERS-COV circulation or have had contact with dromedary camels [13]. Infection prevention and control measures are critical to prevent the possible spread of the disease in health-care facilities. Health-care workers should be educated and trained in infection prevention and control and should refresh these skills regularly [14,15].

Significance of the study

Saudi Arabia is still battling from MERS-CoV so students in all medical fields especially nursing field play great role in prevention of disease transmission among them in health care setting and in between them and their patients which prevent over all community endemic.

Aim of the study

To evaluate the effectiveness of planned teaching guidelines on nursing students regarding Middle East Respiratory Syndrome (MERS).

Statement of the problem

A study to evaluate the effectiveness of planned guidelines on nursing students regarding Middle East Respiratory Syndrome (MERS).

Objectives

1. To assess pretest and posttest level of knowledge on MERS among the subjects.
2. To compare mean pretest and mean posttest knowledge score on MERS among the subjects.
3. To associate pretest level of knowledge on MERS among subjects with their selected demographic variables (age, marital status).

Hypotheses (Level of significance $p < 0.05$)

1. Mean posttest knowledge score will be higher than the mean pretest knowledge score on MERS among the subjects.
2. There will be a significant association on the pretest level of knowledge on MERS among subjects with selected demographic variables (age, marital status).

II. SUBJECTS AND METHODS

- **Research approach** : Quantitative evaluative approach
- **Research design** : Quasi experimental design (One group-pretest-posttest design)
- **Setting of the study** : This study was conducted in the college of nursing and allied health sciences, Jazan University KSA.
- **Sample:** Convenience sample consisted of 78 students from level 5 students studying in college of nursing and allied health sciences, Jazan University this level prepared to go to hospital training. Inclusion criteria; Students who are willing to participate in the study. Exclusion criteria; Students absent on the day of data collection and students whom previously exposed to any training program related to MERS.
- **Research tools:**
 1. **Part 1:Socio Demographic characteristics of the students:** This was used to collect the data from studied sample about their age, marital status, any family member affected with MERS, previous source of information on MERS and details on previous exposure to training program on MERS.
 2. **Part 2: Self -administered knowledge questionnaire on MERS :** This questionnaire contains 16 multiple choice questions related to the body system affected by MERS as country which reported first case, year in the first case identified, country which had recent outbreak, cause, mode of transmission, signs and symptoms, management and preventive measures on MERS. Each questions has 4 options to answer. Each right answer carries 1 mark. Wrong answer was given 0 marks. Obtained individual scores was converted into percentage and interpreted as follows:
 - $\geq 75\%$ and above means adequate knowledge.
 - 50-74% means moderately adequate knowledge.
 - $< 50\%$ means inadequate knowledge.

Students' guidelines package: It was designed by the researchers according to the actual educational needs assessment of the studied subjects.

1. **Assessment phase:** The guidelines were designed by the researchers based on results obtained from pre assessment tools. It was revised and modified according to the related literature. Cultural and socio demographic aspect of the study sample were designed to cover students' knowledge.
2. **Program development:** The guidelines were in a form of Arabic language to be easy understood for the students. Pretest was given to identify weakness in students' knowledge to include it in the guideline. The content of the guidelines handout has information about definition of MERS, effect of it on the body system, country which reported first case, causative organism, mode of transmission, signs and symptoms, high risk group, diagnostic test, vaccine availability, complications, management, and preventive measures for individuals and health care personal.
3. **Implementation phase:** A clear and simple explanation was offered to students about aim of the study and its expected outcomes. Each student was assessed individually (10-20 minutes) using the previously mentioned tools. The total number of the sample 78 students was divided by 10 students per week. The guidelines were introduced to each student separately over a period of two months, 2 sessions /week the total numbers of sessions was 12 sessions. Each session is ranged from 1-2 hours. In the first session pre-test was done and objectives of the program were explained to the students. Also a copy from guidelines handout was given to each student, then the subject of session was introduced followed by a period of discussion.
4. **Evaluation phase:** The evaluation of the effectiveness of the guidelines was measured after two weeks by reassessing the students' knowledge by using the same tool (posttest)

Ethical consideration

Formal permission was obtained from the College Dean, informed written consent was collected from subjects after explaining the nature and purpose of the study. Further, they were assured of privacy and confidentiality of the collected data.

Field work

Tools were reviewed for appropriateness of items through revised from experts giving their opinions, and test validated. A Pilot study was conducted on 10 subjects after conducting the pilot study, it was found that the questions of the tool were clear and relevant, following the pilot study findings; the tool was finalized, valid, reliable and made ready for use. The process of data collection was carried out from April to end of May 2016

Statistical analysis

The calculated data were analyzed and tabulated. The demographic data were analyzed with frequency and percentage using Chi square. Also level of knowledge was assessed with frequency and percentage. Comparison of pretest and posttest mean knowledge difference within subjects was analyzed with paired t test and

association between pretest level of knowledge and selected demographic variables [age and marital status] was analyzed by chi-square test.

III. RESULTS

Table (1): Distribution of the students socio demographic characteristics N=78

S.No	Demographic characteristics	F	%
1.	Age in years		
	a. 20	20	25.6
	b. 21	29	37.2
	c. 22	22	28.2
	d. 23	05	06.4
	e. 24	02	02.6
	Mean age 21.24 ± 0.996		
2.	Marital status		
	a. Single	67	85.9
	b. Married	11	14.1
3.	Family members affected with MERS		
	a. Yes	0	0.0
	b. No	78	100
4(i)	Previous knowledge about MERS		
	a. Yes	19	24.4
	b. No	59	75.6
4(ii)	If yes, source of knowledge		
	a. Television	8	42.1
	b. Internet	4	21.0
	c. Newspapers	2	10.5
	d. Peer group	1	05.3
	e. Health care personnel	4	21.1
5.	Previous exposure to any educational training program on MERS		
	a. Yes	0	0.0
	b. No	78	100

Table (1): shows that about one third of the subjects 37.2% belong to 21 years and least 2.6% in 24 years. Mean age of the subjects was 21.24 ± 0.996. Most of them 85.9% were single and only 14.1% were married. None of their family members were affected with MERS. Only 24.4% subjects had previous knowledge about MERS in which 42.1% acquired through television, 21% through internet, 21.1% by health personnel, 10.5% from newspapers and only 5.3% through peer group. None of the subjects had previous exposure to any educational training program.

Table (2): Area of knowledge on MERS among subjects in pretest and posttest N=78

S.No	Items	Pretest		Posttest	
		Correct	Incorrect	Correct	Incorrect
		n (%)	n (%)	n (%)	n (%)
1	The body system affected by MERS	60 (77%)	18 (23%)	78 (100%)	0 (0.0%)
2	Country which reported first case	27 (35%)	51 (65%)	66 (84.6%)	12 (15.4%)
3	Year in which first case identified	19 (24%)	59 (76%)	57 (73%)	21 (27%)
4	Country which had recent outbreak	6 (8%)	72 (92%)	52 (67%)	26 (33%)
5	Causative organism responsible for MERS	22 (28%)	56 (72%)	70 (90%)	8 (10%)
6	Zoonotic reservoir for MERS	38 (49%)	40 (51%)	75 (96%)	3 (4%)
7	Mode of transmission in humans	17 (22%)	61 (78%)	63 (81%)	15 (19%)
8	Salient signs/symptoms of MERS	40 (51%)	38 (49%)	66 (85%)	12 (15%)
9	High risk group for MERS	27 (35%)	51 (65%)	61 (78%)	17 (22%)
10	Confirmatory test to diagnose MERS	19 (24%)	59 (76%)	49 (63%)	29 (37%)
11	Vaccine availability for MERS	12 (15%)	66 (85%)	45 (58%)	33 (42%)
12	Complications of MERS	32 (41%)	46 (59%)	56 (72%)	22 (28%)
13	Preventive measures for individuals	15 (19%)	63 (81%)	60 (77%)	18 (23%)
14	Preventive measures to HCP	5 (6%)	73 (94%)	52 (67%)	26 (33%)
15	Period recommended for contact tracing	17 (22%)	61 (78%)	50 (64%)	28 (36%)
16	International organization gives guidelines on management of MERS	27 (35%)	51 (65%)	62 (79%)	16 (21%)

Table (2): demonstrates the item of knowledge on MERS in pretest and posttest among subjects. In pretest majority of the subjects have given incorrect answers to all the items except body system affected by MERS (77%). However in posttest most of them were given correct answers to some of the items but nearly one third of subjects remained with incorrect answers in regard to confirmatory test for diagnosis (37%), vaccine availability (42%), preventive measures to health care personnel HCP (33%) and period recommended for contact tracing (36%).

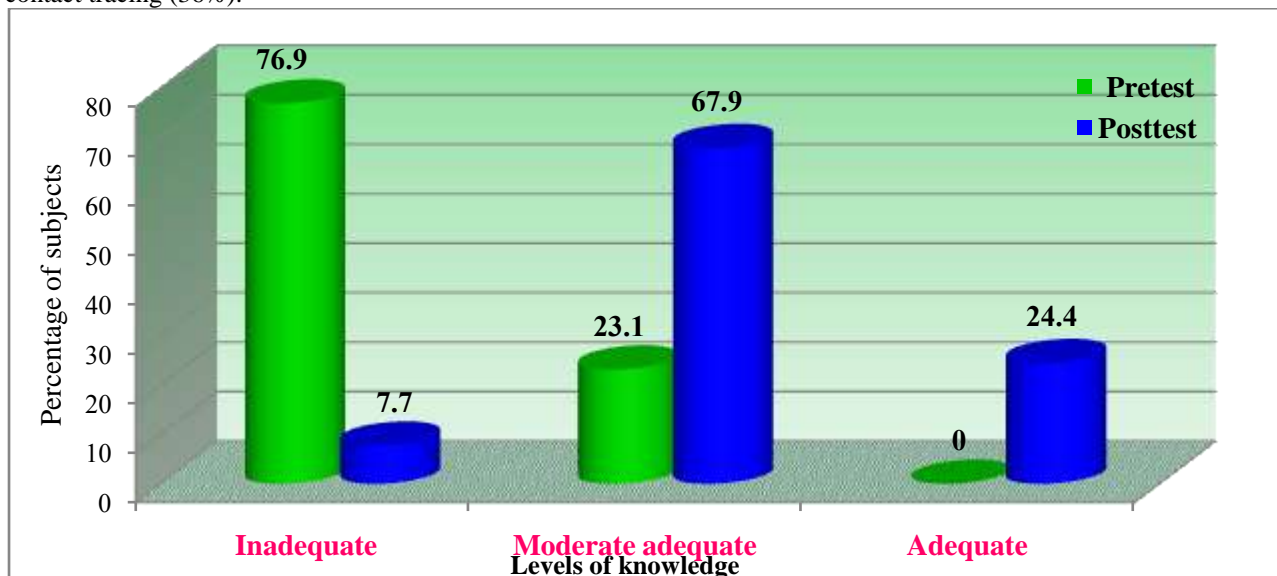


Figure (1): Levels of knowledge on MERS among subjects in pretest and posttest

Fig. (1): showed that in pretest more than three fourth of subjects (76.9%) had inadequate knowledge. Also 23.1% had moderate adequate knowledge and none of them had adequate knowledge. But in posttest, most of them 67.9% showed moderately adequate knowledge, 24.4% had adequate knowledge and rest 7.7% subjects static with inadequate knowledge.

Table (3): Comparison of pretest and posttest knowledge on MERS within subjects. N=78

S.No	Measurement	Range	Mean	SD	Paired t test	P value
1.	Pretest	0-10	4.91	3.033	14.680	0.000***
2.	Posttest	6-14	10.28	1.851		

*** Significant p<0.001.

(df=77)

Table (3) presents the comparison on pretest and posttest knowledge on MERS between subjects. In pretest the knowledge ranged from 0 to 10, mean of 4.91 with SD 3.033. In posttest the knowledge ranged between 6 to 14 with increase in mean of 10.28 with SD 1.851. Further the calculated paired t test value was 14.680 (df=77) which had statistical significance (p<0.001). So the first research hypothesis was accepted totally.

Table (4): Association between pretest level of knowledge on MERS among subjects with selected demographic variables N=78

S.o	Demographic characteristics	Inadequate	Moderate adequate	χ^2	df	P value
		F	F			
1.	Age in years			8.274	4	0.082 ^{NS}
	a. 20	15	5			
	b. 21	22	6			
	c. 22	18	5			
	d. 23	5	0			
e. 24	0	2				
2.	Marital status			0.173	1	0.678 ^{NS}
	a. Single	51	16			
	b. Married	9	2			

NS-Not Significant.

Table (4): shows the association between pretest level of knowledge on MERS with selected demographic variables. There was no significant association on pretest level of knowledge on MERS with their age and marital status of subjects. So the second research hypothesis was rejected.

IV. DISCUSSION

Middle East Respiratory Syndrome can affect any one. It is transmitted primarily from animals to people but transmission from people to people is also possible and has been identified among family members, patients and health care workers, most of cases to date have occurred in health care setting [16].

Regarding distribution of studied subjects' socio demographic characteristics, out of 78 study participants, more than one third of them 37.2% belong to 21 years and least 2.6% in 24 years. Mean age of the subjects was 21.24 ± 0.996 . Most of them 85.9% were single and only 14.1% were married. None of their family members were affected with MERS. About 24.4% subjects had previous knowledge about MERS in which 42.1% acquired through television, 21% from internet, 21.1% by health personnel, 10.5% from newspapers and only 5.3% through peer group. None of the subjects had previous attendance to any educational training program. Above study findings noticed in a similar study conducted by [17] among dental college students showed 27% of respondents had gained their knowledge about MERS from college and 25% from MOH, while 17% of respondents had no idea. Also [18] found that the majority of students sought information and have ideas about the epidemics from twitter followed by television.

According to area of knowledge on MERS among studied subjects. The present study showed that in pretest, poor knowledge was more apparent in response to questions regarding the country which reported first case (65%), year in which first case identified(76%), country which had recent outbreak (92%), causative organism responsible for MERS(72%), zoonotic reservoir for MERS(51%),mode of transmission in humans (78%), salient signs/symptoms of MERS(49%),high risk group for MERS(65%), confirmatory test to diagnose MERS (76%), vaccine availability (85%), complications of MERS (59%), preventive measures for individuals (81%), preventive measures to health care personnel (94%), period recommended for contact tracing (78%) and international organization gives guidelines on management of MERS (65%).

The current study findings are supported with a cross sectional study conducted by [19] who found poor knowledge was more apparent in response to questions regarding the treatment of MERS, availability of vaccines and the consequences of MERs in which the rate of incorrect responses were 57.6%, 44% and 28.8% respectively. Mean knowledge score of healthcare worker was 9.45 ± 1.69 . Also [20] who noticed poor knowledge among the studied subjects regarding reservoir of infection (49.5%),methods of transmission of infection to human (31%),transmission through renal dialysis (58.7%), characteristics of Saudi' infected cases (36%),incubation period in human (40.9%), disease manifestations in human (42%), recommendations when admitting suspected or confirmed case at hospital(46.6%), recommendations for contact of confirmed case at home (28.1%), diagnosis of disease in human (24.2%), availability of vaccine (26.0%), protection by seasonal influenza vaccine (40.6%), travel ban to the kingdom (43.8%), methods of providing healthcare to patients(50.9%) and returning to daily activities in case of cure (69.4%). As clear from table two also post planned teaching guidelines more than half of the subjects gave correct response to most of the items, but nearly one third of subjects remained with incorrect response to items like confirmatory test for diagnosis (37%), vaccine availability (42%), preventive measures to health care personnel (33%) and period recommended for contact tracing (36%). Pretest level of knowledge on MERS revealed more than three fourth of subjects (76.9%) had inadequate knowledge, 23.1% had moderately adequate knowledge and none of them had adequate knowledge. In posttest, more than half of the subjects (67.9%) gained moderately adequate knowledge, 24.4% had adequate knowledge and rest 7.7% of subjects had inadequate knowledge as clear from figure (1). The current study findings are not supported with survey study conducted by [21] in Najran Saudi Arabia who found that the students were highly aware about the clinical aspects of MERS including diagnosis, treatment, transmission and preventive measures but the majority of them indicated that they are in need for further education and training programs because they were lacking background awareness in the basic sciences.

Regarding to comparison of pre-posttest knowledge within the subjects. Further paired t test applied to analyze the difference on knowledge within subjects between measurements. Mean pretest knowledge score was 4.91 with SD 3.033 with a range of 0 to 10. Mean posttest knowledge score was 10.28 with SD 1.851 with a range of 6 to 14.Further calculated paired t test value was 14.680which had statistical significance($p < 0.001$). This result supported by [22] who found that the baseline knowledge among students was low before educational workshop sessions while knowledge increase after educational workshop session. Hence hypothesis H_1 was accepted. According to association between pretest level of knowledge on MERS among subjects with selected demographic variables, there was no significant association on pretest level of knowledge on MERS with their age and marital status of subjects. Hence hypothesis H_2 was rejected.

V. CONCLUSION

Based on the results of the present study. It was concluded that planned teaching program was effective in improving knowledge of nursing students on Middle East Respiratory Syndrome. Further it emphasizes the need

to implement these kind of educational program in regular basis to fill up the knowledge gaps and to reinforce infection control practices in individual and community level.

Recommendations

Based on the results of the present study. It was recommended that:

- Continuous health education programs are necessary to all health workers to improve their knowledge and practices related to prevention and control of Middle East Respiratory syndrome (MERS).
- More researches are needed to identify more information about MERS, methods of transmission and preventive measures.

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