

## Knowledge, Attitude and Practice on MERS CoV among Nursing Students at Hail University

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**Abstract:** Middle East Respiratory Syndrome Coronavirus (MERS CoV) is an emerging pathogen with pandemic potential with its apparent epicenter in the Kingdom of Saudi Arabia. A high proportion of people who affected by the virus were health care workers. **Aim:** Assess knowledge, attitude and practice of nursing students on MERS-CoV. **Design:** A descriptive exploratory approach was used. **Setting:** The study was conducted at three multispecialty hospitals of Hail region, Saudi Arabia. **Sample:** Convenient sample consisted of 90 female nursing students. **Tools:** 1 Self-administered questionnaire including demographic data, Knowledge, Attitude regarding MERS CoV. 2 Practice assessment questionnaire regarding MERS CoV. **Results:** The majority of studied sample (88.9%) ages were <25 years old, and (53.3%) their knowledge source from radio and television. About half of the sample had incorrect knowledge about source of virus, vaccination and diagnosis of MERS CoV. 75.6% had correct total knowledge score about corona virus, and 71.1% had correct total practice score. 60% of studied sample had negative attitude toward MERS CoV. A statistical significant positive correlation between knowledge and practice regarding corona virus infection prevention (P value 0.003) was found. **Conclusion:** The current study findings concluded that the studied sample had good knowledge score as well as good practice score, while had negative attitude toward MERS CoV. **Recommendations:** Further comparative study comparing between male and female student nurses regarding MERS CoV knowledge, attitude and practice are suggested.

**Keywords:** Knowledge, Attitude and Practice, Middle East Respiratory Syndrome

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### I. Introduction

Middle East Respiratory Syndrome – Corona virus (MERS-CoV) is a novel virus belonging to genus Beta coronavirus. It is a zoonotic virus that is transmitted from animal to human. The origin of the virus is not fully understood, it is believed that it originated in bats and was transmitted to camels sometimes in the distant past. The route of transmission from animal to human 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.<sup>1</sup>

Middle East Respiratory Syndrome – Corona virus (MERS-CoV) was first reported in Saudi Arabia in September 2012<sup>2</sup>. Immediately after that, the disease appeared in other Arab peninsula countries such as Qatar, United Arab Emirates (UAE), Kuwait, and then spread to Middle East and non-Middle East countries<sup>3</sup>. However, the majority of cases (85%) have been reported from Kingdom of Saudi Arabia (KSA)<sup>4</sup>. There is a progressive increase in the number of cases and number of deaths in KSA, where five cases reported in 2012, 160 in 2013, 664 in 2014, and 377 cases until the end of August 2015<sup>5</sup>. In October 2015, a total number of confirmed cases of corona infection in KSA were 1251 of these cases 536 died<sup>6</sup>.

Initially, the eastern region of KSA was affected by MERS; however reports have revealed that the virus has penetrated throughout the country including the region of Qaseem<sup>7</sup>. Qaseem is well-known to hold the largest world camel market in the world. This region is also described as having plentiful water, lots of fruit trees, palm trees and greenery. The reproduction of bats is generally very high because of this environment and it may infect camels with MERS-CoV.<sup>8</sup> The large numbers of reported cases from KSA also reflect the transmission of this infection in healthcare settings<sup>9</sup>.

A typical presentation of the disease includes fever, cough, shortness of breath may occur; 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<sup>10</sup>. The virus appears to cause more severe disease in people with immune system problems; as older people; pregnant women and people have chronic diseases such as diabetes, cancer and chronic lung disease<sup>11</sup>.

A study conducted by Assiri, et al., (2013)<sup>7</sup> reported the transmission of the virus through a hospital cluster, suggesting the mode of spread through contact and in the form of droplets. Abnormal findings of chest radiograph are very common in MERS patients, while laboratory reports have shown thrombocytopenia, lymphopenia and increase concentration of lactate dehydrogenase and aspartate aminotransferase. The mortality rate was 60%. It has been reported that infection control measures can keep the virus at bay. However if the required actions are not taken promptly, it may cause significant disease burden on society and results in number of human deaths<sup>9</sup>.

The occurrence of asymptomatic and subclinical MERS-CoV in healthcare settings could be a huge threat to public health. In view of this, Health care workers (HCWs) are at great risk of acquiring this infection or become a source of transmission to patients and their colleagues. The Ministry of health, KSA has responded promptly to this outbreak and has designed guidelines for educating HCWs based on recommendations of World Health Organization<sup>12</sup>.

Nurses play an important role in the disease preventive measures and health education to an infected person about isolation, wear face mask, use separate room and bath if it is available, avoid sharing household items and hand washing is very important<sup>13</sup>. 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 a contact with dromedary camels<sup>14</sup>. Therefore, this study was conducted to assess knowledge, attitude and practice of nursing students as one of health care workers towards MERS-CoV in Hail region of Saudi Arabia.

## II. Methodology

**Aim of the study:** To assess knowledge, attitude and practice on MERS CoV among nursing students at Hail University.

**Study design:** A descriptive exploratory approach was used in this study.

**Setting:** Permission was obtained from concerned authorities and the study was conducted at three multispecialty hospitals of Hail region, Saudi Arabia. Namely Hail General Hospital, King Khalid Hospital, Maternity and Child health Hospital where the nursing students were trained.

**Sample:** Convenient sample of 90 female internship nursing students trained in the previously mentioned hospitals was selected to participate in the current study.

### Study instruments:

The data of this study was collected through using

1) Self-administered Questionnaire adopted from Khan, et al., (2014)<sup>15</sup>, after permission from the responsible author. It was divided into 4 parts. The first part comprised of demographic data of the participants. The second part identified the source of participants' MERS knowledge. The third part assessed the knowledge of nursing students regarding MERS in which Yes or No option was given against each set of question. The last part determined the attitude of respondents towards MERS in which their responses were evaluated through 5 point Likert scale of agreement.

The study instrument assessed the knowledge of nursing students by asking questions about the nature, etiology, symptoms, risk group, consequences, source of transmission, prevention and treatment of MERS-CoV. Knowledge scores ranged from 0-13 and cut off level of <9 were set for poor knowledge and  $\geq 9$  for good knowledge. Knowledge was assessed by giving 1 to correct answer and 0 to incorrect answer. Assessment of attitude was carried out through 7 item questions in which the responses were recorded on 5 point likert scale. A score of 1 was given to strongly agree, 2 to agree, 3 to undecided, 4 to disagree and 5 to strongly disagree. A mean score of  $\leq 2$  was considered as positive attitude while score of 3-5 was taken as negative attitude. Reliability coefficient was calculated by using SPSS v.20 and the value of Cronbach's alpha was found to be 0.74.

2- **Practice Assessment Questionnaire** was adopted from Nour, et al., (2015)<sup>16</sup> after permission from the responsible author to measure practice related to MERS-CoV. It includes 8 practice related questions ranking (yes, no, or sometimes). Scoring was one point for right practice and zero for no or sometimes the total mark was 8. The accepted total practice score was  $\geq 6$  points for good practice and < 6 for poor practice. The total scores for knowledge, attitude, and practice were categorized into good/positive or poor/negative based on 75% cutoff point out of the total expected score for each.

**Procedure:**

Approval from the responsible authorities was obtained. The researcher explains the aim of the research for the internship nursing students who agree to participate in the study after taking written informed consent. The data was collected from participants in the studied hospitals from September 2016 to January 2017. The researcher provides self-administered questionnaire to assess selected demographic, knowledge and attitude about MERS CoV using tool (1). Then assesses practice about MERS CoV using tool (2). Time used to fill in the questionnaire was from 15 to 25 minutes.

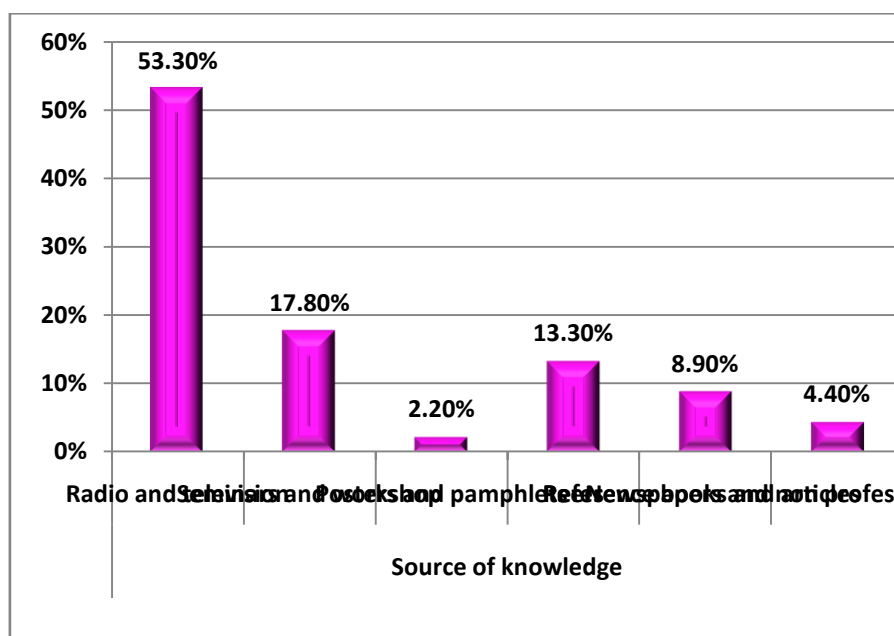
**Statistical analysis:**

Data were collected, tabulated, statistically analyzed using Statistical Package of Social Science (SPSS) version 20 where the following statistics were applied.

- a- **Descriptive statistics:** in which quantitative data were presented in the form of mean ( $\bar{X}$ ), standard deviation (SD), range, and qualitative data were presented in the form of numbers and percentages.
- b- **Analytical statistics:** used to find out the possible association between studied factors and the targeted disease. The used tests of significance included: Chi-square test ( $\chi^2$ ): was used to study association between two qualitative variables. Pearson correlation (r test): is used to measure the association between two quantitative variables. P value of <0.05 was considered statistically significant. P value of <0.001 was considered statistically highly significant.

**III. Results**

This study involved 90 internship female nurse students, (88.9%) of them, their age was less than 25 years old and (84.4%) has less than 6 months of internship year. Moreover, (51.1%) were from King Khalid, while (6.7%) were from maternal health hospital.



**Figure (1)** Source of knowledge about MERS Co V among studied sample (n= 90).

Figure (1) shows that (53.3%) of the studied sample their source of knowledge about corona virus was from radio and television, while only (2.2%) gains knowledge from posters and pamphlets.

**Table (1):** Percentage distribution of Knowledge scores among studied sample (N=90):

Studied variables	Knowledge scores			
	Correct		Incorrect	
	No.	%	No.	%
MERS-CoV is caused by alpha corona virus	72	80.0	18	20.0
MERS patients develop severe acute respiratory illness	80	88.9	10	11.1
Fever, cough and shortness of breath are hallmark symptoms of MERS	84	93.3	6	6.70
People with co-morbidity (Diabetes, cancer and other chronic diseases) are more likely	72	80.0	18	20.0

to be infected				
Incubation time for virus is 14-28 days	28	31.1	62	68.9
It spread through close contact with infected persons like caring and/or living	32	35.6	58	64.4
The main source of MERS virus is plant	43	47.8	47	52.2
Washing hand with soap and water for at least 30 secs can help in prevention of transmission of disease	48	53.3	42	46.7
Vaccination of MERS virus is available in market	38	42.2	52	57.8
Polymerase Chain Reaction (PCR) can be used to diagnose MERS	32	35.6	58	64.4
Special Caution must be taken when person presents with symptoms of MERS from Arabian Peninsula region	70	77.8	20	22.2
Antibiotics are first line treatment	70	77.8	20	22.2
MERS can be fatal	66	73.3	24	26.7
Total knowledge scores	68	75.6	22	24.4

Table (1), shows that (93.3%) and (88.9%) of the studied sample has correct knowledge about manifestations and complications of MERS CoV respectively. While only (35.6%) and (31.1%) had correct knowledge about mode of spread and incubation period of MERS CoV respectively. Also (47.8) and (42.2%) (77.8%) of the studied sample has correct knowledge about source of MERS CoV and availability of vaccine respectively. Moreover (75.6%) of the studied sample has good total knowledge score about MERS CoV.

**Table (2):** Percentage distribution of practice score among studied sample (N=90):

Studied variables	Practice scores			
	Good		Poor	
	No	(%)	No	(%)
Use soap and water to wash hands continuously	84	93.3	6	6.7
Cover nose and mouth with a tissue during sneezing or coughing	72	80.0	18	20
Avoid touching eyes, nose or mouth as far as can	60	66.7	30	33.3
Use face mask in crowds	48	53.3	42	46.8
Carefully handle suspected patient's belongings	66	73.3	24	26.7
Keep on healthy eating and health styles	62	68.9	28	31
Used to educate patient about the disease	22	42.5	68	75.6
Total practice scores	64	71.1	26	28.9

Table (2), shows that (93.3%) and (80%) of the studied sample has good practice about washing hands continuously and cover nose and mouth during sneezing or coughing respectively. While only (42.5%) used to educate the patient about the disease. It also shows that (71.1%) had good total practice scores about MERS CoV.

**Table (3):** Percentage distribution of Attitude about MERS CoV among studied group (N=90).

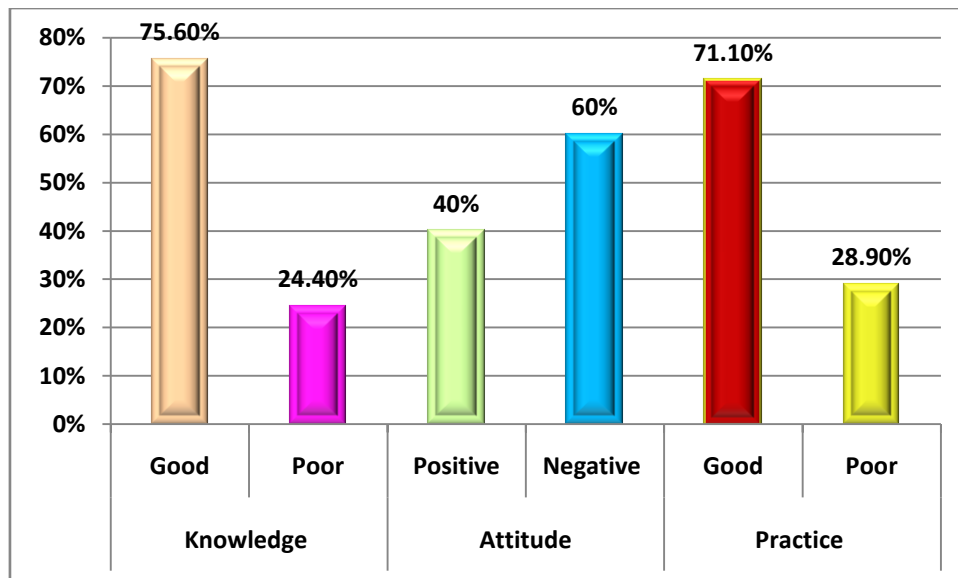
Studied variables	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
	No (%)	No (%)	No (%)	No (%)	No (%)
Transmission of MERS-CoV infection can be prevented by using universal precautions	28(31.1)	18(20.0)	12(13.3)	26(28.9)	6(6.7)
Prevalence of MERS can be reduced by active participation of health care worker in hospital infection control program	32(35.6)	4(4.4)	12(13.3)	32(35.6)	10(11.1)
Any related information about MERS should be disseminated among peers and other healthcare workers	18(20.0)	20(22.2)	16(17.8)	24(26.7)	12(13.3)
MERS patients should be kept in isolation	18(20.0)	10(11.1)	12(13.3)	26(28.9)	24(26.7)
Intensive and emergency treatment should be given to diagnosed patients	16(17.8)	6(6.7)	12(13.3)	32(35.6)	24(26.7)
Healthcare workers must acknowledge themselves with all the information about MERS	16(17.8)	10(11.1)	16(17.8)	20(22.2)	28(31.1)
Gowns, gloves, mask and goggles must be used when dealing with MERS patients	26(28.9)	2(2.2)	8(8.9)	20(22.2)	34(37.8)

Table(3) shows that (31.1% )of studied sample are strongly disagree that transmission of MERS-CoV infection can be prevented by using universal precautions, and (37.8%) are strongly agree that gowns, gloves, mask and goggles must be used when dealing with MERS patients .

**Table (4):** Total attitude score among studied group (N=90):

Studied variables		No.	%
Total attitude	Positive	36	40.0
	Negative	54	60.0

Table (4), presents that only (40%) of studied sample had positive total attitude toward MERS CoV.



**Figure (2).** Percentage distribution of total knowledge, attitude and practice among studied sample (N=90)

Figure: (2) Presents that (75.60%) and (71.1%) of the studied sample has good total knowledge and practice score respectively. While only (40%) has positive attitude toward MERSCoV.

**Table (5):** Correlation between total knowledge score, attitude score and practice score among studied sample (N=90):

Studied variables	Total Knowledge score	
	r- test	P value
Total Attitude score	0.303	0.004*
Total Practice score	0.310	0.003*

\*Significant

Table (5), illustrates that there is a statistical significant positive correlation between studied sample knowledge scores and attitude as well as practice (r=0.30 P=0.004, and r=0.31, P=0.003) respectively.

#### IV. Discussion

The current study aimed to assess knowledge, attitude and practice on Middle East Respiratory Syndrome – Corona virus among internship nursing students in multispecialty Hail Hospitals, Saudi Arabia.

The findings of this study elaborate that the majority of studied sample age was less than 25 years old; this result is consistent with previous study<sup>17</sup>, who found that more than one third of their study belongs to 21 years. The current study also presents that the majority of studied sample has less than 6 months in internship and around half of them their source of knowledge about MERS CoV was from radio and TV while only 2.2% gains their knowledge from poster and pamphlets, this could explain that the internship students did not expose to enough updated knowledge as a result of short duration of internship. This study results go in the same line with other studies' results<sup>17,18</sup> who reported that the main source of knowledge about MERS acquired through television.

The present study showed that the majority of the studied sample had good knowledge about manifestations, complications and treatment of MERS CoV, while around one third of them had good knowledge about mode of spread and incubation period of MERS CoV. This finding is in contrast to previous study<sup>17</sup> who found that most of their study sample had knowledge about mode of transmission, signs, symptoms and complications of MERS. Moreover, Findings are supported with survey study conducted by<sup>16</sup> in Najran Saudi Arabia who found that the students were highly aware about the clinical aspects of MERS including diagnosis and treatment. This finding was consistent with the study done by<sup>15</sup> among Health Care Workers (HCWs) in Qaseem, Saudi Arabia, which showed 73.2% of the respondents had good knowledge. Another study was done by<sup>16</sup> among HCWs in Makkah Hospitals, Saudi Arabia, showed that only 32.4% of the respondents had good knowledge.

The existing study findings are supported with a cross sectional study conducted by<sup>19</sup> who found poor knowledge was more apparent in response to questions regarding the availability of Vaccines and source of MERS CoV. This finding is also consistent with<sup>20,21</sup> who mentioned the lack of respondents' knowledge about the source of MERS-CoV, about 44% of the HCWs answered it incorrectly.

More than three quarters of the current study had total good knowledge score about MERS CoV. The discrepancy in these results could be explained by the outbreak of MERS in Saudi Arabia is very recent and there are more talks about it among the healthcare workers and in the community. Since, the focus is more towards symptoms and prevention; this may have increased their knowledge about the disease in these areas.

Regarding internship nursing student's practices on MERS CoV, the current study showed that the majority of the studied sample had good practice about washing hands continuously and covers nose and mouth during sneezing or coughing. While only 42.5% used to educate the patient about the disease. It also showed that near to three quarters had good total practice scores about MERS CoV. These results are in consistent with Riyadh study which showed a higher level of proper hygienic practices among participants. Ninety-four percent of the participants reported washing hands regularly, and more than 90% reported using respiratory protective measures. In a study aimed to examine the KAP toward the use of facemasks among hospital-based HCWs in Hanoi, Vietnam, where facemasks and respirators were considered as an ineffective approach of preventing respiratory infections, most participants described facemasks/respirators as the only and the best protective method available to protect HCWs from respiratory infections<sup>22</sup>.

More than one third of the existing study had positive attitude toward MERS CoV. This might be due to that, the majority of internship student nurses had less than 6 months in internship and didn't expose to different situations as a result of the traditional norms and customs in Saudi Arabia, in addition to lack of interaction and socialization of females which could influence their attitude. This result coincides with a study done by<sup>23</sup> who reported that physicians had more positive attitude than nurses because of their in depth clinical training on infection control. The present study showed that more than one third of studied sample is strongly agree that gowns, gloves, mask and goggles must be used when dealing with MERS patients. This finding is in line with<sup>24</sup> who showed positive response from the healthcare

The present study showed that there is a statistical significant correlation between studied sample knowledge scores and attitude as well as practice score. The current study also presents that most of studied sample had good total knowledge and practice score, while most of them had negative attitude toward MERS CoV. These results go in line with<sup>16</sup> study results that reported negative attitude and good practices towards MERS-CoV, but inconsistent with results related to knowledge. Moreover, a study performed at Al Qaseem region by<sup>15</sup> reported good knowledge and positive attitude of healthcare workers towards the infection.

## **V. Conclusion and recommendations:**

Internship student nurses of Hail Saudi Arabia had good knowledge score as well as total practice scores, while have negative attitude toward MERS CoV. However there is still need for improvement in certain areas like the possible sources of virus transmission and the mode of transmission of MERS CoV. Extensive health education should be provided to internship student nurses to bridge the gap between the current and the required knowledge by focusing on less knowledgeable areas. The study recommends establishing professional and occupational campaigns to augment the knowledge of internship student nurses which would also positively influence their attitude towards MERS CoV. Moreover, further comparative study comparing between male and female student nurses regarding MERS CoV knowledge, attitude and practice are suggested.

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