

# MIDDLE EAST RESPIRATORY SYNDROME-CORONAVIRUS (MERS-CoV), AWARENESS AMONG PHC ATTENDEES AT KFMMC, EASTERN PROVINCE, SAUDI ARABIA

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**Abstract:** Following the discovery of various Middle East Respiratory Syndrome Coronavirus (MERS-CoV) patients in the Arabian Peninsula especially Saudi Arabia were many cases confirmed diagnostically and some deaths were reported, stakeholders need to determine community awareness of the disease. **Methodology:** descriptive cross-sectional study conducted among PHC attendees at KFMMC through self administered questionnaire. **Objective:** determine the PHC attendees' knowledge about the MERS-CoV, their attitude and practice toward causes, treatment and prevention of the disease. **Results:** Of the 722 respondents covered in this research (n=375, 51.9%) were males and (n=347, 48.1%) were females from eastern region, Kingdom of Saudi Arabia. The respondents source of information was the television (n=271, 37.5%) followed by newspapers and magazines (n=125, 17.3%) and friends and family (n=107, 14.8%). Regarding symptoms of MERS-CoV infection, the proportion of respondents citing fever was highest (68.4%) followed by pneumonia (56.9%). The respondents' knowledge about preventive measures from MERS-CoV infection was highest (mean score of  $62 \pm 24\%$ ). Although the respondents' knowledge about the symptoms of infection and their attitude toward it are satisfactory, however most of them don't know the causes of infection (48%), and 62.9% thought that the mode of transmission is human to human. **Conclusion:** The analysis shows some differences in people awareness of the disease, these differences could be related to gender, level of education or work place factors. So, we need to have some public lectures, flyers and TV shows to explain the details of MERS-CoV related to its causes, mode of transmission, preventive measures and treatment modalities.

**Keywords:** MERS-CoV, novel coronavirus, Knowledge, Attitude, practice, Saudi Arabia.

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## 1. INTRODUCTION

Coronaviruses are a large family of viruses that cause illness in humans and animals. In people, coronaviruses can cause illnesses ranging in severity from the common cold to Severe Acute Respiratory Syndrome (SARS).

The novel coronavirus, first detected in April 2012, is a new virus that has not been seen in humans before. In most cases, it has caused severe disease. Death has occurred in about half of cases.

Nine countries have now reported cases of human infection with MERS-CoV. Cases have been reported in France, Germany, Italy, Jordan, Qatar, Saudi Arabia, Tunisia, the United Arab Emirates, and the United Kingdom. All cases have had some connection (whether direct or indirect) with the Middle East.

In France, Italy, Tunisia and the United Kingdom, limited local transmission has occurred in people who had not been to the Middle East but who had been in close contact with laboratory-confirmed or probable cases.

Since the last update of 20 January 2014, 28 laboratory confirmed cases, including 10 deaths, have been reported to WHO. Countries in which the presumed exposure of these cases occurred are shown in Table 1.

## 2. METHODS

### Study area:

King Fahad Military Medical Complex is a tertiary hospital with large PHC department with average 400 visits per day. **Study population:** all 13 years and older attending the PHC at KFMMC during the study period (February 1<sup>st</sup>, 2014 to February 15<sup>th</sup>, 2014). **Study design:** descriptive cross-sectional study.

### Data collection tool:

A questionnaire constructed by research team, inculcating Socio-demographic information (gender, age, educational level, occupation status, region, source of information), knowledge about MERS-CoV (causes, mode of transmission, symptoms), attitude toward the virus and preventive measures. The response choices for all knowledge questions were given on a three-point Likert-type scale using "yes", "not known", "no" options for the causes of coronavirus infection, most of speed of coronavirus, signs and symptoms and preventive measures; whereas, the response choice for the question about the attitude toward coronavirus were given on a four-point Likert (from 1 to 4, 1 = disagree, 2 = not sure, 3 = agree and 4 = strongly agree. The weighted mean for three point Likert scale is (1-1.66 No, 1.67-2.33, Not known, 2.34 – 3, Yes). The weighted mean for four point Likert scale is (1-1.76, disagree, 1.75 – 2.49 not sure, 2.50 – 3.24 agree, and 3.25 – 4, strongly agree). A percent knowledge score was computed for the knowledge items.

### Statistical Analysis:

The data were analyzed using IBM SPSS version 21 for Windows after removing the surveys not adapted the limitation of the study (age less than 13, respondent not from the eastern region). Data on socio-demographic characteristics, knowledge, attitudes and practice, of respondents were summarized using descriptive statistics of frequency and percentages. The researchers used ANOVA which tested the variance between the groups, the value of F is specified for the presence of variation at the level of confidence (95%), and Scheffe test to see statistical significance level defined as a two-tailed ( $p \leq 0.05$ ).

## 3. RESULTS

Of the 722 respondents covered in this research (n=375, 51.9%) were males and (n=347, 48.1%) were females from eastern region, Kingdom of Saudi Arabia, the majority from Dammam city (n=489, 67.7%), Khobar city (n=70, 9.7%) and Alahsa city (n=57, 7.9%). The mean age of the respondents was (33.50 ± 10.28) years. Significantly more females in age group (13 – 28), (45.8 versus 26.1), and more males in age group (29 – 44), (55.2 versus 44.4). In terms of educational attainment, significantly more females had elementary school (20.7 versus 6.7%), while more male had high school (53.6 versus 42.4%). Almost half of the respondents were employees (n=350, 48.5%), half of them were not employees (n=341, 47.2%), and there were (n=31, 4.3%) from the total respondents missing, reason for that they were (students, unemployed, retired or other). In terms of occupation, significantly more males were employed (88.1 versus 13.5%). The respondents source of information was the television (n=271, 37.5%) followed by newspapers and magazines (n=125, 17.3%) and friends and family (n=107, 14.8%).

In term of causes, around half of participants don't know causes of MERS-CoV (48%). Furthermore, 40% of participants related MERS-CoV to unhygienic food.

For the knowledge about causes of MERS-CoV, based on the likert scale all statements about causes of MERS-CoV are within range of unknown (1.67- 2.33). the mean score was (2.17 ± 0.52).

Unlike the first domain, the second domain about mode of transmission of MERS-CoV; more than half of respondents determined mode of transmissions. More specifically, more than 60% went with human to human transmission.

The total number of iterations on mode of transmission of MERS-Co-V (3610). The level of grades was: category ((yes)) (n=1875, 52%), category ((not known) (n=1367, 38%), and the category ((No)) (n=368, 10%).

For the knowledge about mode of transmission of MERS-CoV, the respondents' means of most of statements are within 'yes' category in likert scale (2.34 – 3). The mean score was (2.42 ± 0.52).

Respondents were also asked to rate their knowledge about symptoms of MERS-CoV. The proportion of respondents citing fever was highest (68.4%) followed by pneumonia (56.9%). In general, there was no much difference between those who determine specific symptoms for MERS-CoV (47%) and those who didn't know the symptoms (43%).

For the knowledge about symptoms of MERS-CoV the respondents' means of all symptoms are within 'yes' category in likert scale (2.34-3) except kidney failure in which there mean lie within 'not known' score (1.67-2.33) , the mean score was (2.38 ± 0.38).

Around two third of respondents were aware regarding preventive measure from MERS-CoV (65%) , which washing hands and avoiding close contacts were the most prevalent measures 78.4% ,78.1% respectively.

Around 48% of participants did not know whether there is vaccine for the virus or not .

For the knowledge about protective measures of MERS-CoV, the respondents means of all preventive measures are within 'yes' category of likert scale (2.34-3) except the mean of respondents knowledge about availability of vaccine which lie within unknown category of likert score (1.67-2.33). the mean score was (2.59 ± 0.38). For the Attitude toward MERS-CoV, the mean score was (3.16 ± 0.59). we can notice that the mean of respondents attitude regarding risk of getting the MERS-CoV is 2.49 which mean that they were not sure about the risk of getting the disease. all categories of respondents have high weight average in general, where the averages of the respondents did not fall from the 2.49 degrees in all the statements, this means that the majority of the respondents answered strongly agree or agree.

The respondents' knowledge and attitudes mean and significance about MERS-CoV by gender is reported in Table 2.

with refer to table 2 , there was statistically significant difference between males and female in some statement of domains. in more details, males stated mosquito bite as a cause for MERS-CoV, animal to human as a mode of transmission, respiratory failure and kidney failure as symptoms, as well as their attitudes toward the disease in compared to females.

It can be seen from Table (2) above that there is an effect of the gender variable response sample appeared in eight statements (mosquito bite, respiratory failure, kidney failure and all statements related to treatment of MERS-CoV) were it's highly significance for male ( $p \leq 0.05$ ), only one statement were equal (can be prevented).

The respondents' knowledge and attitudes mean and significance about MERS-CoV by age group is reported in Table 3

It can be seen from Table (3) above that there is a different between the responses on some statements related to the age group intervals, for mode of transmission of MERS-CoV (animal to human) the age group (61-76) significantly has a high response than the other age groups. The opinions of the respondents about the symptoms of statements MERS-CoV are different (fever, pneumonia, respiratory failure and kidney failure) depending on age group, also there is a different between the answers about the statements (MERS-CoV is a serious illness; you are at risk of getting it).

The respondents' knowledge and attitudes mean and significance about MERS-CoV by educational level group is reported in Table.4

It can be seen from Table (4) above that there is a statistical significant difference between the respondents of higher level of education (college and above) in compared to other education levels in their knowledge about symptoms of MERS-CoV (sore throat, fever, pneumonia, respiratory failure), and attitude toward the disease (seriousness of illness and need for treatment and hospitalization). in the other hand, there were a significant difference regarding the respondents' knowledge about the availability of vaccine in elementary school educational level.

The respondents' knowledge and attitudes mean and significance about MERS-CoV by occupation status group is reported in Table 5.

It can be seen from Table (5) above that there is a difference between the responses on a lot of statements related to the occupation, for causes of MERS-CoV (Mosquito bite) the employed people significantly had a high response than the not employed, mode of transmission of MERS-CoV (human to human, animal to human) the employed people significantly had a high response than the not employed. The opinions of the respondents about the symptoms of MERS-CoV were different in 4 statements (fever, pneumonia, respiratory failure and kidney failure) depending on occupation, also there were a difference between the answers about preventive measures against MERS-CoV in two statements (washing hand often with soap and water, avoid close contact with people a serious illness). Regarding the attitude of MERS-CoV all the statements were highly significant between employees and non-employees.

#### 4. DISCUSSION

Being firstly and relatively more spread in Saudi Arabia, the coronavirus is the media and public daily discussion topic especially among patients and health workers. This analysis of data from the eastern province in Saudi Arabia tries to shed some insight on people awareness and attitude towards the prevention of the virus.

Due to the registered illness cases being restricted to people who work in hospitals or people who had some contacts with hospitals the survey outcomes show various differences in the general populations' knowledge, attitude and awareness towards coronavirus which would reflect on various practices for the prevention.

On the causes of the MERS-CoV, the highest average of the answer 'Not Known' was registered with 48% of the total category frequency. In terms of symptoms, fever and pneumonia are considered the highest indication among the population for a potential illness with MERS-CoV. with regards to differences in symptoms of MERS-CoV, there are a noticed variation between groups (sex, age group, education level and occupational status).

More than 50% of respondents stated that there is a mode of transmission mainly human to human transmission 62.9%. however, males; who were mainly employed (86.6%) gave a statistical difference in compared to females in favor of animal to human as a mode of transmission and mosquito bite as a cause.

Most of our research participants got their information about the disease from the television (37.5%), followed by newspapers and magazine (17.3%). so, it is important for the public health professionals and decision makers to concentrate into these media as a source of information.

**Table 1: Geographic distribution of laboratory-confirmed cases by country of presumed exposure since 20 January 2014.**

Country	Cases	Deaths
Jordan	1	1
Kuwait	1	1
Oman	2	1
Saudi Arabia	22	7
United Arab Emirates	2	0
Total	28	10

**Table 2: Knowledge and attitudes about MERS-CoV by gender**

	Gender		F	p-value*
	Male (mean)	Female (mean)		
<b>Causes of MERS-CoV infection</b>				
Mosquito bite	2.24	2.10	6.688	0.010
<b>Mode of transmission of MERS-CoV</b>				
Animal to human	2.36	2.22	8.405	0.004
<b>Symptoms of MERS-CoV</b>				
Respiratory failure	2.45	2.29	10.942	0.001
Kidney failure	2.03	1.90	7.260	0.007
<b>Attitude toward MERS-CoV</b>				
MERS-CoV is a serious illness	3.54	3.31	12.881	0.000
You are at risk of getting it	2.72	2.24	53.428	0.000
Can be prevented	3.22	3.22	17.033	0.000
Need for treatment and hospitalization	3.71	3.50	14.038	0.000

**Table 3: Knowledge and attitudes about MERS-CoV by age group**

	Age group					F	p-value*
	13 - 28	29 - 44	45 - 60	61 - 76	77 - 92		
Mode of transmission of MERS-CoV							
Animal to human	2.18	2.37	2.29	2.50	2.00	3.417	0.009
Symptoms of MERS-CoV							
Fever	2.60	2.67	2.68	2.50	1.50	3.071	0.016
Pneumonia	2.45	2.58	2.55	2.40	1.50	3.763	0.005
Respiratory failure	2.23	2.46	2.38	2.50	2.50	5.414	0.000
Kidney failure	1.88	1.99	2.11	2.10	1.50	2.843	0.023
Attitude toward MERS-CoV							
MERS-CoV is a serious illness	3.28	3.53	3.45	3.70	2.50	4.368	0.002
You are at risk of getting it	2.30	2.59	2.58	2.70	3.50	4.891	0.001

**Table 4: Knowledge and attitudes about MERS-CoV by educational level group**

	Educational level					F	p-value*
	Illiterate	Elem. School	Middle School	High School	College and above		
Symptoms of MERS-CoV							
Score throat	2.25	2.33	2.18	2.39	2.49	3.529	0.007
Fever	2.50	2.52	2.58	2.66	2.71	2.435	0.046
Pneumonia	2.33	2.38	2.48	2.53	2.60	2.784	0.026
Respiratory failure	2.08	2.22	2.40	2.39	2.43	2.614	0.034
Preventive measures against MERS-CoV							
There is vaccine for virus	2.08	2.44	2.37	2.34	2.22	2.738	0.028
Attitude toward MERS-CoV							
MERS-CoV is a serious illness	3.50	3.20	3.25	3.46	3.55	3.704	0.005
Need for treatment and hospitalization	3.33	3.42	3.46	3.64	3.71	3.813	0.004

**Table 5: Knowledge and attitudes about MERS-CoV by occupation status group**

	Occupation status		F	p-value*
	Employee	Not Employee		
Causes of MERS-CoV infection				
Mosquito bite	2.25	2.24	8.964	0.003
Mode of transmission of MERS-CoV				
Human to human	2.63	2.51	7.978	0.005
Animal to human	2.41	2.16	23.421	0.000
Symptoms of MERS-CoV				
Fever	2.68	2.59	4.550	0.033
Pneumonia	2.58	2.45	8.393	0.004
Respiratory failure	2.49	2.24	29.142	0.000
Kidney failure	2.00	1.90	3.846	0.050
Washing your hand often with soap and water	2.80	2.72	4.696	0.031
Avoid close contact with people	2.80	2.71	5.590	0.018
Attitude toward MERS-CoV				
MERS-CoV is a serious illness	3.54	3.28	16.458	0.000
You are at risk of getting it	2.65	2.27	32.438	0.000
Can be prevented	3.18	2.99	9.143	0.003
Need for treatment and hospitalization	3.71	3.48	17.775	0.000

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