ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 11, Issue, 09, pp.7274-7280, September, 2019

DOI: https://doi.org/10.24941/ijcr.36104.09.2019

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

MIDDLE EAST RESPIRATORY SYNDROME- CORONAVIRUS - KNOWLEDGE AND ATTITUDE AMONG HEALTH CARE WORKERS IN KING FAHAD CENTRAL HOSPITAL JAZAN CITY OF SAUDI ARABIA 1439 H

Waleed I. Muqri[1], Dr. Abulrhman Mohammed Salim[2], Mohanned Alharthi[3], Ali Shubaili[4], Mohammed A.Masmali[5], Osama A. Alharbi[6], HussainY.Rayani[7], Fahad N.Khormi[8], Dr. Mowafeg A.Gadri[9 *] and SehamA. Habeeb[10]

Department of Primary Health Care, Non-Infectious Disease, Family Medicine Department, Gazan University, Saudi Arabia

ARTICLE INFO

Article History:
Received 20th June, 2019
Received in revised form
28th July, 2019
Accepted 25th August, 2019
Published online 30st September, 2019

Key Words:

Knowledge, Attitudes,
Middle East Respiratory Syndrome,
Health care workers.

**Corresponding author:*
Dr. Mowafeg A.Gadri

ABSTRACT

Background: Middle East Respiratory Syndrome-coronavirus causes respiratory illness and has been linked to high morbidity and mortality since it was first found in Saudi Arabia in 2012. Camels have been identified as the likely source of the infection of Middle East Respiratory Syndrome in Egypt, Qatar, and Saudi Arabia. Currently, there is no available treatment for Middle East Respiratory Syndrome-coronavirus; however, many efforts was done by the World Health Organization. Methodsa cross-sectional study aimed to assess the level of knowledge and attitude towards Middle East Respiratory Syndrome among health care workers at King Fahad Central Hospital Jazan city of Saudi Arabia. using structured self-administered questionnaires. ***Results:*** A total of 384 participants (239 female and 145 male) included in the survey. The vast majority of the participants were aged less or equal 29 years (53.9%). In general, our findings showed that (80.7%) having a good knowledge about the infection with mean knowledge score 15.5 ±. 08 and most of them (91.8%) showed positive attitude towards the infection with mean attitude score 30.5±. 2. Female were significantly more knowledgeable compared to male. No significance difference was found between knowledge and respondent age. Physicians were significantly found more knowledge compared to other health care workers concerning many terms of knowledge. ***Conclusion:*** Our study showed that generally there are good knowledge and positive attitude among healthcare workers at King Fahad Central Hospital Jazan city of Saudi Arabia towards Middle East Respiratory Syndrome-coronavirus in general a part of, certain gaps needs Continued and strengthened educational programs, moreover making the maximum benefit to modern technology to spread the information.

Citation: Waleed I. Muqri, Dr. Abulrhman Mohammed Salim, Mohanned Alharthi et al. **2019.** "Middle East Respiratory Syndrome- Coronavirus - knowledge and attitude among health care workers in King Fahad Central Hospital Jazan city of Saudi Arabia", *International Journal of Current Research*, 11, (09), 7274-7280.

INTRODUCTION

World Health Organization (2012) announced that a Middle East respiratory disorder (MERS) is a viral respiratory ailment. Corona infection (MERS-CoV) which at first happened in Saudi Arabia (WHO, 2015). In any case, corona infections are a huge group of infections that can bring about ailments running from the basic icy to Severe Acute Respiratory Syndrome (SARS). The MERS indications commonly incorporate fever, hack and shortness of breath. Gastrointestinal manifestations, including looseness of the bowels, have additionally been accounted for. A thirty-six of detailed patients with MERS have passed on. The greater part of human instances of MERS have been come back to human-to-human diseases. Camels are probably going to be a noteworthy store have for MERS-CoV and a creature wellspring of MERS contamination in people. Consequently, a camels transmission of the infection and the route(s) of transmission are huge (WHO, 2015).

Raoul *et al.,* 2013 expressed that obscure coronavirus (CoV) was isola ted from the sputum of a patient among the year 2012, in Jeddah, Saudi Arabia, with intense pneumonia and renal failure which later called human coronavirus Erasmus Medical Center (EMC) (Raoul *et al.,* 2013). The way of transmission MERS-CoV not known as of not long ago but rather contemplates in this area demonstrated that the principle wellspring of this infection is the camel (Azhar *et al.,* 2014), which got tainted by African bats in past. While human-to-human, transmission is constrained on account of MERS. As per the present reports the transmission rate is diminishing yet at the same time this is by all accounts broadly introduce in dromedary camels in the Middle East nations, the present report from Agriculture service of Saudi Arabia has led a test on 112 camels and have found that 85% of the creatures conveyed a destructive MERS-CoV, transmission is required to proceed for a drawn out stretch of time in these districts subsequently circumstance is not totally under control. Hence individuals everywhere throughout the world, particularly in

Middle East nations like Saudi Arabia ought to know about MERS, its causes, and indications (Zumlaa *et al.,* 2015). No specific treatment for the MERS-CoV till date, It was suspected that the antiviral medications which target primary protease and papain-like protease of SARS-CoV can be successful for MERS. While those medications are not 100% powerful on MERS (Lei *et al.,* 2014). Health care workers are at high risk to get infection or to become a major source of transmission to hospitalized patients and their colleagues,

METHODS

This study was a cross-sectional study of a representative sample of health care workers at King Fahad Central Hospital Jazan city of Saudi Arabia.1439Ha, included allhealth care workers at King Fahad Central Hospital Jazan city (physicians, nurses, pharmacist and staff technicians).who signed consent to participate in the study before to answer the questionnaire those who not signed were excluded.

Sampling

The target population were 1253 which includes; 375 doctors, 709 nurses, 115staff technicians and 54 pharmacists. The minimum sample size for this study has been decided according to

The following formula;

$$n = \frac{Z^2 \text{ X } P \text{ X } Q}{D^2}$$

Where:
n: Calculated sample size
Z: The z-value for the selected level of confidence = 1.96.
P: 0.5 to provide the maximum sample size =50%
Q: (1 – P) = 50%
D: The maximum acceptable error [precision level] = 0.05.

$$n = \frac{1.96^2 \text{ X } 0.50 \text{ X } 0.50}{0.05^2} = \frac{3.8416 \text{ X } 0.25}{0.0025} = 384$$

The estimated sample size was 384 health care workers

A self-administered questionnaire was created both in Arabic and English after a thorough search in the literature based on the most recent available information from the World Health Organization. Data was entered and analyzed using statistical Package for Social Sciences (SPSS) software version 22.0Descriptive statistics (e.g. Number, percentage) and analytic statistics using Chi Square tests (χ^2) to test for the association and/or the difference between two categorical variables were applied. A p-value less than 0.05 were considered statistically significant. Multivariate analysis: regression analysis was used to adjust for confounding factors. Permission of the King Fahad Central Hospital authorities and research committee in jazan university in was obtained. Also informed consent was obtained from all participants.

RESULTS

As shown in table 1 which provides socio-demographic data of the sample A total of 384 participants (239 females and 145 male) were participated most of them were aged less or equal 29 years (53.9%), and less than 5% (4.7%) of the participants were equal or more than 50 years or older. More than half of participants were nurses (56.5%) while physicians, pharmacists and technicians accounted for 29.7, 4.7 and 9.1%, respectively. Regarding years of work experience, about more than one third of them (34.9%) had experience of 3-6 years, nearly half one third (28.6%) less than 3 years and only 14.1% had experience between 7-10 years and 22.4% had more than 10 years of work experience. As shown in table (2).The main source of getting information about MERS was posters and pamphlets (24.2%), Radio and TV (19.3 %). And the least source of knowledge was from newspapers and non-professional magazines and 4.9% from peers. And 3% (3.1%) of the participants reported laypersons. The overall mean knowledge score was 15.5 ± 0.08. Nearly 81% of the studied sample (80.7%) had good knowledge and the remaining (19.3%) had poor knowledge (Table 4). Poor knowledge was more apparent in response to questions regarding caused of infection (42.7%), incubation time of virus (50.3%), Polymerase Chain Reaction (PCR) can be used to diagnose MERS (25.3%) and used of antibiotics are first line treatment (43%) (Table 3).

Table 1. Distribution of health care workersat King Fahad Central Hospital Jazan city according to their characteristics in 1439H

Socio-demographic characteristics	Response	Frequency	%
Age	≤ 29	207	53.9
	30-39	125	32.6
	40-49	33	8.6
	≥ 50	19	4.9
	Total	384	100.0
Gender	Male	145	37.8
	Female	239	62.2
	Total	384	100.0
Profession	Physician	114	29.7
	Pharmacist	18	4.7
	Nurse	217	56.5
	Technical Staff	35	9.1
	Total	384	100.0
Years of Experience	≤ 3	110	28.6
	3-6	134	34.9
	7-10	54	14.1
	≥ 10	86	22.4
	Total	384	100.0

Table 2. Source of health care workers at King Fahad Central Hospital Jazan city information about MERS Knowledge in 1439H

Knowledge	Response	Frequency	%
Source of information	Radio & TV	74	19.3
	Seminar and workshops	71	18.5
	Posters and pamphlets	93	24.2
	Peers	19	4.9
	Reference books and articles	72	18.8
	Newspapers and non-professional magazines	43	11.2
	Lay persons	12	3.1
	Total	384	100.0

Table (4) shows that there were significances deference between respondents gender and knowledge of respondents about Mers-COV except with special caution must be taken when person came with symptoms of MERS-COV came from Arabian pensulian (p-value equal 0.010) and knowledge regarding Antibiotic are first line treatment (p-value equal 0.016). However female were significantly more knowledgeable regarding the special caution must be taken when person came with symptoms from Arabian pensulian (93. 3 % vs. 82.1 %). While male were significantly more knowledgeable compared to female concerning Antibiotic are first line treatment of Mers-COV (64.8 % vs. 52.3 %) Table (4). Table (5) indicates no signficance differences were found between respondents age and their knowledge about Mers-COV (p-value is greater than 0.05).

Table 3.Knowledge of healthcare workers at King Fahad Central Hospital Jazan city about MERS in 1439H

Knowledge of MERS	Correct answer N (%)	Incorrect answer N (%)
MERS-CoV is caused by alpha coronavirus	220 (57.3)	164 (42.7)
MERS patients may develop severe acute respiratory illness	368 (95.8)	16 (4.2)
Fever, cough and shortness of breath are hallmark symptoms of MERS	369 (96.1)	15 (3.9)
People with co-morbidity (Diabetes, cancer and other chronic diseases) are more likely to be infected	314 (81.8)	70 (18.2)
Incubation time for virus is 14-28days	191 (49.7)	193 (50.3)
spreads through close contact with infected persons like those to take care of \ or live with	355 (92.4)	29 (7.6)
The main source of MERS virus is plant	352 (91.7)	32 (8.3)
Washing hand with soap and water for at least 30 seconds can help in prevention of transmission of disease	335 (87.2)	49 (12.8)
Vaccination of MERS virus could be available in market	312 (81.3)	72 (18.8)
Polymerase Chain Reaction (PCR) can be used to diagnose MERS	287 (74.7)	97 (25.3)
Special Caution must be taken when person presents with symptoms of MERS from Arabian Peninsula region	342 (89.1)	42 (10.9)
Antibiotics are first line treatment	219 (57.0)	165 (43.0)
MERS can be fatal	361 (94.0)	23 (6.0)

Mean knowledge score = (15.5 ± .08)

Table 4. Relationship between gender and respondents knowledge about Mers-CoV at King Fahad Central Hospital Jazan city towards MERS in 1439

Knowledge		Gender		Total	χ^2	P-value
		Male	Female			
MERS-CoV is caused by alpha coronavirus	Correct	79 (54.5%)	141 (59%)	220 (57.3%)		
	Incorrect	66 (45.5%)	98 (41%)	164 (42.7%)		
	Total	145 (100%)	239 (100%)	384 (100%)	.751	.233
MERS patients may develop severe acute respiratory illness	Correct	137(94.5%)	231(96.7%)	368 (95.8%)		
	Incorrect	8 (5.5%)	8 (3.3%)	16 (4.2%)	1.064	**0**.302
	Total	145(100.0%)	239(100.0%)	384(100.0%)		
Fever, cough and shortness of breath are hallmark symptoms of MERS	Correct	139 (95.9%)	230 (96.2%)	369 (96.1%)		
	Incorrect	6 (4.1%)	9 (3.8%)	15 (3.9%)	**0**.033	**0**.855
	Total	145(100.0%)	239 (100.0%)	384 (100.0%)		
People with co-morbidity (Diabetes, cancer and other chronic diseases) are more likely to be infected	Correct	122 (84.1%)	192 (80.3%)	314 (81.8%)		
	Incorrect	23 (15.9%)	47 (19.7%)	70 (18.2%)	**0**.876	**0**.349
	Total	145 (100.0%)	239 (100.0%)	384 (100.0%)		
Incubation time for virus is 14-28days	Correct	66 (45.5%)	125 (52.3%)	191 (49.7%)		
	Incorrect	79 (54.5%)	114 (47.7%)	193 (50.3%)	1.661	**0**.197
	Total	145 (100.0%)	239 (100.0%)	384 (100.0%)		
It spreads through close contact with infected persons like those to take care of \ or live with	Correct	133 (91.7%)	222 (92.9%)	355 (92.4%)		
	Incorrect	12 (8.3%)	17 (7.1%)	29 (7.6%)	**0**.175	**0**.676
	Total	145 (100.0%)	239 (100.0%)	384 (100.0%)		
The main source of MERS virus is plant	Correct	132 (91.0%)	220 (92.1%)	352 (91.7%)		
	Incorrect	13 (9.0%)	19 (7.9%)	32 (8.3%)	**0**.122	**0**.727
	Total	145 (100.0%)	239 (100.0%)	384 (100.0%)		
Washing hand with soap and water for at least 30 seconds can help in prevention of transmission of disease	Correct	130 (89.7%)	205 (85.8%)	335 (87.2%)		
	Incorrect	15 (10.3%)	34 (14.2%)	49 (12.8%)	1.221	**0**.269
	Total	145 (100.0%)	239 (100.0%)	384 (100.0%)		
Vaccination of MERS virus could be available in market	Correct	111(76.6%)	201 (84.1%)	312 (81.3%)		
	Incorrect	34 (23.4%)	38 (15.9%)	72 (18.8%)	3.376	**0**.066
	Total	145 (100.0%)	239 (100.0%)	384 (100.0%)		
Polymerase Chain Reaction (PCR) can be used to diagnose MERS	Correct	109 (75.2%)	178 (74.5%)	287 (74.7%)		
	Incorrect	36 (24.8%)	61(25.5%)	97 (25.3%)	**0**.023	**0**.879
	Total	145 (100.0%)	239 (100.0%)	384 (100.0%)		
Special Caution must be taken when person presents with symptoms of MERS from Arabian Peninsula region	Correct	119 (82.1%)	223 (93.3%)	342 (89.1%)		
	Incorrect	26 (17.9%)	16 (6.7%)	42 (10.9%)	11.697	**0**.001
	Total	145 (100.0%)	239 (100.0%)	384 (100.0%)		
Antibiotics are first line treatment	Correct	94 (64.8%)	125 (52.3%)	219 (57.0%)		
	Incorrect	51 (35.2%)	114 (47.7%)	165 (43.0%)	5.779	**0**.016
	Total	145 (100.0%)	239 (100.0%)	384 (100.0%)		
MERS can be fatal	Correct	139 (95.9%)	222 (92.9%)	361(94.0%)		
	Incorrect	6 (4.1%)	17 (7.1%)	23(6.0%)	1.419	**0**.234
	Total	145 (100.0%)	239 (100.0%)	384 (100.0%)		

Table (**6**) shows that there were significance differences between profession and knowledge of respondents regarding MErs patients may develop severe acute respiratory illne Table (7), revealed that the mean scores of attitudes of health care workers were (30.5±. 2). More than half of health care workers (50.8%) agreed that transmission of MERS-CoV infection can be prevented by using universal precautions given by CDC, WHO etc. And also nearly half (49.2%) thought that Prevalence of MERS can be reduced by active participation of health care worker in hospital infection control program. While 46.6% of them thought that any related information about MERS should be disseminated among peers and other healthcare workers. More than one third (39.6%) of health care workers thought that MERS patients should be kept in isolation and 42.4% believed that intensive and emergency treatment should be given to diagnosed patients. More than two third of the participants (60.2%) thought that Healthcare workers must get to know all information about MERS and also same proportion thought that gowns, gloves, mask and googles must be used when dealing with MERS patients. The study shows no significance difference were found between health care workers attitudes about MERS and health care workers personal characteristics such as profession, gender, age and experience, $p > 0.05$.

Table 5. Relationship between age and respondents knowledge about Mers-COv at King Fahad Central HospitalJazan city towards MERS in 1439H

Knowledge	Response	Age				Total	χ2	P-value
		less than or equal 29	30-39	40-49	Equal or more than 50			
MERS-CoV is caused by alpha coronavirus	Correct	123 (59.7%)	69 (55.2%)	16 (48.5%)	12 (60%)	220 (57.3%)	1.82	**0**.61
	Incorrect	83 (40.3%)	56 (44.8%)	17 (51.5%)	8 (40%)	164 (42.7%)		
	Total	206 (100%)	125 (100%)	33 (100%)	20 (100%)	384 (100%)		
MERS patients may develop severe acute respiratory illness	Correct	196 (95.1%)	120(96.0%)	32(97.0%)	20 (100.0%)	368 (95.8%)	1.229	.746
	Incorrect	10 (4.9%)	5(4.0%)	1 (3.0%)	0 (.0%)	16 (4.2%)		
	Total	206 (100%)	125(100%)	33(100%)	20(100%)	384(100%)		
Fever, cough and shortness of breath are hallmark symptoms of MERS	Correct	197(95.6%)	121(96.8%)	32 (97.0%)	19 (95.0%)	369(96.1%)	**1.23**	**0.746**
	Incorrect	9 (4.4%)	4 (3.2%)	1 (3.0%)	1 (5.0%)	15 (3.9%)		
	Total	206 (100.0%)	125 (100.0%)	33(100.0%)	20 (100.0%)	384 (100.0%)		
People with co-morbidity (Diabetes, cancer and other chronic diseases) are more likely to be infected	Correct	164(79.6%)	101(80.8%)	30(90.9%)	19(95.0%)	314(81.8%)	**0.415**	**0.937**
	Incorrect	42(20.4%)	24(19.2%)	3(9.1%)	1(5.0%)	70(18.2%)		
	Total	206(100.0%)	125(100.0%)	33(100.0%)	20(100.0%)	384(100.0%)		
Incubation time for virus is 14-28day	Correct	106(51.5%)	67(53.6%)	10(30.3%)	8(40.0%)	191(49.7%)	6.734	**0**.081
	Incorrect	100(48.5%)	58(46.4%)	23(69.7%)	12(60.0%)	193(50.3%)		
	Total	206(100.0%)	125(100.0%)	33(100.0%)	20(100.0%)	384(100.0%)		
It spreads through close contact with infected persons like those to take care of \ or live with	Correct	190(92.2%)	118(94.4%)	29(87.9%)	18(90.0%)	355(92.4%)	1.854	**0**.603
	Incorrect	16(7.8%)	7(5.6%)	4(12.1%)	2(10.0%)	29(7.6%)		
	Total	206(100.0%)	125(100.0%)	33(100.0%)	20(100.0%)	384(100.0%)		
The main source of MERS virus is plant	Correct	189(91.7%)	117(93.6%)	27(81.8%)	19(95.0%)	352(91.7%)	5.094	**0**.165
	Incorrect	17(8.3%	8(6.4%)	6(18.2%)	1(5.0%)	32(8.3%)		
	Total	206(100.0%)	125(100.0%)	33(100.0%)	20(100.0%)	384(100.0%)		
Washing hand with soap and water for at least 30 seconds can help in prevention of transmission of disease	Correct	181(87.9%)	107(85.6%)	31(93.9%)	16(80.0%)	335(87.2%)	2.646	**0**.449
	Incorrect	25(12.1%)	18(14.4%)	2(6.1%)	4(20.0%)	49(12.8%)		
	Total	206(100.0%)	125(100.0%)	33(100.0%)	20(100.0%)	384(100.0%)		
Vaccination of MERS virus could be available in market	Correct	169(82.0%)	97(77.6%)	29(87.9%)	17(85.0%)	312(81.3%)	2.314	**0**.510
	Incorrect	37(18.0%)	28(22.4%	4(12.1%)	3(15.0%)	72(18.8%)		
	Total	206(100.0%)	125(100.0%)	33(100.0%)	20(100.0%)	384(100.0%)		
Polymerase Chain Reaction (PCR) can be used to diagnose MERS	Correct	151(73.3%)	93(74.4%)	26(78.8%)	17(85.0%)	287(74.7%)	1.635	**0**.651
	Incorrect	55(26.7%)	32(25.6%)	7(21.2%)	3(15.0%)	97(25.3%)		
	Total	206(100.0%)	125(100.0%)	33(100.0%)	20(100.0%)	384(100.0%)		
Special Caution must be taken when person presents with symptoms of MERS from Arabian Peninsula region	Correct	183(88.8%)	110(88.0%)	31(93.9%)	18(90.0%)	342(89.1%)	**0**.98	**0**.806
	Incorrect	23(11.2%)	15(12.0%)	2(6.1%)	2(10.0%)	42(10.9%)		
	Total	206(100.0%)	125(100.0%)	33(100.0%)	20(100.0%)	384(100.0%)		
Antibiotics are first line treatment	Correct	122(59.2%)	74(59.2%)	13(39.4%)	10(50.0%)	219(57.0%)	5.236	**0**.155
	Incorrect	84(40.8%)	51(40.8%)	20(60.6%)	10(50.0%)	165(43.0%)		
	Total	206(100.0%)	125(100.0%)	33(100.0%)	20(100.0%)	384(100.0%)		
MERS can be fatal	Correct	189(91.7%)	121(96.8%)	33(100.0%)	18(90.0%)	361(94.0%)	6.275	**0**.099
	Incorrect	17(8.3%)	4(3.2%)	0(.0%)	2(10.0%)	23(6.0%)		
Total	Count	206(100.0%)	125(100.0%)	33(100.0%)	20(100.0%)	384(100.0%)		

Table 6. Relationship between Profession and respondents knowledge about Mers-COV at King Fahad Central Hospital Jazan city towards MERS in 1439 H

P-value	χ2	Total	Profession				Response	Knowledge
			Technical Staff	Nurse	Pharmacist	Physician		
		220 (57.3%)	23 (65.7%)	123 (56.7%)	9 (50%)	65 (57%)	Correct	MERS-CoV is caused by alpha coronavirus
.696	1.442	164 (42.7%)	12 (34.3%)	94 (43.3%)	9 (50%)	49 (43%)	Incorrect	
		384 (100%)	35 (100%)	217 (100%)	18 (100%)	114 (100%)	Total	
		368(95.8%)	30(85.7%)	207(95.4%)	17(94.4%)	114(100.0%)	Correct	MERS patients may develop severe acute respiratory illness
0.003	14.125	16(4.2%)	5(14.3%)	10(4.6%)	1 (5.6%)	0 (.0%)	Incorrect	
		384 (100%)	35 (100%)	217 (100%)	18 (100%)	114 (100%)	Total	
		369(96.1%)	32(91.4%)	209(96.3%)	17(94.4%)	111(97.4%)	Correct	Fever, cough and shortness of breath are hallmark symptoms of MERS
0.443	2.681	15(3.9%)	3(8.6%)	8(3.7%)	1(5.6%)	3(2.6%)	Incorrect	
		384 (100%)	35 (100%)	217 (100%)	18 (100%)	114 (100%)	Total	
		314(81.8%)	24(68.6%)	168(77.4%)	15(83.3%)	107(93.9%)	Correct	People with co-morbidity (Diabetes, cancer and other chronic diseases) are more likely to be infected
0.00	18.053	70(18.2%)	11(31.4%)	49(22.6%)	3(16.7%)	7(6.1%)	Incorrect	
		384 (100%)	35 (100%)	217 (100%)	18 (100%)	114 (100%)	Total	
		191(49.7%)	13(37.1%)	108(49.8%)	15(83.3%)	55(48.2%)	Correct	Incubation time for virus is 14-28days
0.015	10.449	193(50.3%)	22(62.9%)	109(50.2%)	3(16.7%)	59(51.8%)	Incorrect	
		384 (100%)	35 (100%)	217 (100%)	18 (100%)	114 (100%)	Total	
		355(92.4%)	32(91.4%)	197(90.8%)	17(94.4%)	109(95.6%)	Correct	It spreads through close contact with infected persons like those to take care of \ or live with
0.448	2.653	29(7.6%)	3(8.6%)	20(9.2%)	1(5.6%)	5(4.4%)	Incorrect	
		384 (100%)	35 (100%)	217 (100%)	18 (100%)	114 (100%)	Total	
		352(91.7%)	27(77.1%)	197(90.8%)	18(100.0%)	110(96.5%)	Correct	The main source of MERS virus is plant
0.002	14.997	32(8.3%)	8(22.9%)	20(9.2%)	0(.0%)	4(3.5%)	Incorrect	
		384 (100%)	35 (100%)	217 (100%)	18 (100%)	114 (100%)	Total	
		335(87.2%)	29(82.9%)	189(87.1%)	16(88.9%)	101(88.6%)	Correct	Washing hand with soap and water for at least 30 seconds can help in prevention of transmission of disease
0.840	**0**.840	49(12.8%)	6(17.1%)	28(12.9%)	2(11.1%)	13(11.4%)	Incorrect	
		384 (100%)	35 (100%)	217 (100%)	18 (100%)	114 (100%)	Total	
		312(81.3%)	26(74.3%)	184(84.8%)	12(66.7%)	90(78.9%)	Correct	Vaccination of MERS virus could be available in market
0.121	5.812	72(18.8%)	9(25.7%)	33(15.2%)	6(33.3%)	24(21.1%)	Incorrect	
		384 (100%)	35 (100%)	217 (100%)	18 (100%)	114 (100%)	Total	
		287(74.7%)	18(51.4%)	153(70.5%)	14(77.8%)	102(89.5%)	Correct	Polymerase Chain Reaction (PCR) can be used to diagnose MERS
0.000	25.33	97(25.3%)	17(48.6%)	64(29.5%)	4(22.2%)	12(10.5%)	Incorrect	
		384 (100%)	35 (100%)	217 (100%)	18 (100%)	114 (100%)	Total	
		342(89.1%)	25(71.4%)	208(95.9%)	14(77.8%)	95(83.3%)	Correct	Special Caution must be taken when person presents with symptoms of MERS from Arabian Peninsula region
0.000	27.637	42(10.9%)	10(28.6%)	9(4.1%)	4(22.2%)	19(16.7%)	Incorrect	
		384 (100%)	35 (100%)	217 (100%)	18 (100%)	114 (100%)	Total	
		219(57.0%)	13(37.1%)	96(44.2%)	13(72.2%)	97(85.1%)	Correct	Antibiotics are first line treatment
0.000	58.453	165(43.0%)	22(62.9%)	121(55.8%)	5(27.8%)	17(14.9%)	Incorrect	
		384 (100%)	35 (100%)	217 (100%)	18 (100%)	114 (100%)	Total	
		361(94.0%)	33(94.3%)	199(91.7%)	18(100.0%)	111(97.4%)	Correct	MERS can be fatal
0.14	5.483	23(6.0%)	2(5.7%)	18(8.3%)	0(.0%)	3(2.6%)	Incorrect	
		384 (100%)	35 (100%)	217 (100%)	18 (100%)	114 (100%)	Total	

Table 4.7. Attitude of healthcare workers at King Fahad Central HospitalJazan city towards MERS in 1439H

		Profession				Total	P-value
		Physician	Pharmacist	Nurse	Technical Staff		
Transmission of MERS-CoV infection can be prevented by using universal precautions given by CDC, WHO etc.	Strongly disagree	7 (6.1%)	0 (0.0%)	5 (2.3%)	1 (2.9%)	13 (3.4%)	
	Disagree	2 (1.8%)	0 (0.0%)	5 (2.3%)	2 (5.7%)	9 (2.3%)	
	Undecided	4 (3.5%)	2 (11.1%)	10 (4.6%)	10 (28.6%)	26 (6.8%)	
	Agree	61 (53.5%)	8 (44.4%)	114 (52.5%)	12 (34.3%)	195 (50.8%)	0.000*
	Strongly agree	40 (35.1%)	8 (44.4%)	83 (38.2%)	10 (28.6%)	141 (36.7%)	
	Total	114 (100.0%)	18 (100.0%)	217 (100.0%)	35 (100.0%)	384 (100.0%)	
Prevalence of MERS can be reduced by active participation of health care worker in hospital infection control program	Strongly disagree	4 (3.5%)	0(0.0%)	3 (1.4%)	1 (2.9%)	8 (2.1%)	
	Disagree	1 (0.9%)	1 (5.6%)	0(0.0%)	0(0.0%)	2 (0.5%)	
	Undecided	5 (4.4%)	0(0.0%)	13 (6%)	5 (14.3%)	23 (6%)	.091
	Agree	56 (49.1%)	10 (55.6%)	109 (50.2%)	14 (40%)	189 (49.2%)	
	Strongly agree	48 (42.1%)	7 (38.9%)	92 (42.4%)	15 (42.9%)	162 (42.2%)	
	Total	114 (100.0%)	18 (100.0%)	217 (100.0%)	35 (100.0%)	384 (100.0%)	
Any related information about MERS should be disseminated among peers and other healthcare workers	Strongly disagree	4 (3.5%)	0 (0.0%)	5 (2.3%)	0 (0.0%)	9 (2.3%)	
	Disagree	1 (0.9%)	0 (0.0%)	5 (2.3%)	3 (8.6%)	9 (2.3%)	
	Undecided	6 (5.3%)	1 (5.6%)	16 (7.4%)	3 (8.6%)	26 (6.8%)	0.068
	Agree	53 (46.5%)	5 (27.8%)	111 (51.2%)	10 (28.6%)	179 (46.6%)	
	Strongly agree	50 (43.9%)	12 (66.7%)	80 (36.9%)	19 (54.3%)	161 (41.9%)	
	Total	114 (100.0%)	18 (100.0%)	217 (100.0%)	35 (100.0%)	384 9100.0%)	
MERS patients should be kept in isolation	Strongly disagree	2 (1.8%)	0 (0.0%)	2 (0.9%)	0 (0.0%)	4 (1%)	
	Disagree	1 (0.9%)	0 (0.0%)	2 (0.9%)	3 (8.6%)	6 (1.6%)	
	Undecided	9 (7.9%)	3 (16.7%)	12 (5.5%)	2 (5.7%)	26 (6.8%)	0.106
	Agree	49 (43%)	7 (38.9%)	83 (38.2%)	13 (37.1%)	152 (39.6%)	
	Strongly agree	53 (46.5%)	8 (44.4%)	118 (54.4%)	17 (48.6%)	196 (51%)	
	Total	114 (100.0%)	18 (100.0%)	217 9100.0%)	35 (100.0%)	384 (100.0%)	
Intensive and emergency treatment should be given to diagnosed patients	Strongly disagree	3 (2.6%)	0 (0.0%)	2 (0.9%)	0 (0.0%)	5 (1.3%)	
	Disagree	1 (0.9%)	1 (5.6%)	1 (0.5%)	1 (2.9%)	4 91%)	
	Undecided	8 (7%)	1 (5.6%)	9 (4.1%)	2 (5.7%)	20 (5.2%)	0.445
	Agree	52 (45.6%)	5 (27.8%)	93 (42.9%)	13 (37.1%)	163 (42.4%)	
	Strongly agree	50 (43.9%)	11 (61.1%)	112 (51.6%)	19 (54.3%)	192 (50%)	
	Total	114 (100.0%)	18 (100.0%)	217 (100.0%)	35 (100.0%)	384 (100.0%)	
Healthcare workers must get to know all information about MERS	Strongly disagree	2 (1.8%)	0 (0.0%)	2 (0.9%)	0 (0.0%)	4 (1%)	
	Disagree	0 (0.0%)	1 (5.6%)	4 (1.8%)	0 (0.0%)	5 (1.3%)	
	Undecided	5 (4.4%)	0 (0.0%)	2 (0.9%)	1 (2.9%)	8 (2.1%)	0.060
	Agree	47 (41.2%)	2 (11.1%)	79 (36.4%)	8 (22.9%)	136 (35.4%)	
	Strongly agree	60 (52.6%)	15 (83.3%)	130 (59.9%)	26 (74.3%)	231 (60.2%)	
	Total	114 (100.0%)	18 (100.0%)	217 (100.0%)	35 (100.0%)	384 (100.0%)	
Gowns, gloves, mask and googles must be used when dealing with MERS patients	Strongly disagree	3 (2.6%)	0 (0.0%)	2 (0.9%)	0 (0.0%)	5 (1.3%)	
	Disagree	1 (0.9%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1	
	Undecided	3 (2.6%)	0 (0.0%)	2 (0.9%)	1 (2.9%)	6 (1.6%)	0.147
	Agree	48 (42.1%)	3 (16.7%)	79 (36.4%)	7 (20%)	137 (35.7%)	
	Strongly agree	59 (51.8%)	15 (83.3%)	134 (61.8%)	27 (77.1%)	235 (61.2%)	
	Total	114 (100.0%)	18 (100.0%)	217 (100.0%)	35 (100.0%)	384 (100.0%)	

Mean attitudes scores= (30.5± .2); SD=Strongly Disagree; D= Disagree; U=Undecided; SA= Strongly Agree; A=Agree

Table (8): Overall score of knowledge and attitude of workers at King Fahad Central Hospital Jazan city in 1439H

Items	Appropriate / Favorable	inappropriate / unfavorable
Knowledge	80.7	19.3
Attitudes	91.8	8.2

The overall mean attitude score was (30.5 ±. 2). Nearly 92% (91.8%) of the studied sample had favorable attitude only 8.2% had unfavorable attitude (Table 4.7). On average, the most favorable attitudes of healthcare providers observed regarding MERS patients should be kept in isolation (9.4%), any related information about MERS should be disseminated among peers and other healthcare workers (11.4%), and Gowns, gloves, mask and goggles must be used when dealing with MERS patients (3.9%) (Table 8).

DISCUSSION

The findings of this study showed good knowledge and positive attitude of HCWs towards MERS-CoV. Majority of the respondents had gained knowledge about MERS from posters and pamphlets as shown by this study. This may be returned to the a packages of posters and pamphlets that disseminated through primary health care centers to school, societies during the period of apparent of Corona virus in kingdom of Saudi Arabia. This result is however is not supported by study which showed that participants' main source of knowledge about such kind of virus was Television (Brug *et al.,* 2004). This finding was in agreement with Khan *et al*. (2014) at AlQassim region and another study on healthcare providers to use internet technology to gain access to those documents and also not in agreement with Arda *et al.,* 2011 and Chor *et al.,* 2011. On the other hand, the most number of correct responses were gathered from the question about the symptoms of MERS followed by the question indicated that MERS patients may develop severe acute respiratory illness and knowledge can be fatal. These findings may be due to emphasis by the health authorities on such issues in their awareness program. These results are in line with the findings of other study which showed the good knowledge of health care workers with SARS-CoV (Mohamed *et al.,* 2015). However, with regards to knowledge of symptoms the result of current research (96.1%) is not in line with a study conducted in US (73%) to determine HCWs knowledge of SARS in which a poor knowledge was recorded when asked about symptoms of SARS (Tice *et al.,* 2006). The discrepancy in these results could be explained by a fact that educational campaigns by relevant authorities in Saudi Arabia have focused more on sign and symptoms of MERS which may have enhanced their knowledge in this area of MERS

(http://www.moh.gov.sa/en/CCC). In addition, other reasons may be returned to an outbreak of MERS in Saudi Arabia is very recent and there are more talks about it among the healthcare workers and in the community (Bener and Al-Khal, 2004). Another issue that needs to be highlight is the lack of participants' knowledge about the incubation period in human. About 50.3% of them answered it incorrectly. Although, researches have revealed that, the incubation period could be as long as two weeks (WHO MERS-CoV Research Group, 2013; Cauchemez *et al.,* 2014), their knowledge regarding this question was weak. Therefore, it is necessary to reveal this aspect of virus epidemiology to healthcare providers (Lessler *et al.,* 2009). In terms of attitude of healthcare providers towards MERS-CoV infection, it was found to be in the positive range. This may be because MERS-CoV infection is known for healthcare workers with previous experience or exposure to such cases. This might be supported by such hypothesis that described attitude, in general, as the result of either direct experiential or observational learning from the environment and an attitude based upon direct experience appears to be more likely than one based upon indirect experience to have an impact on behavior (Fazio *et al.,* 1982). While other studies in agreement with our study findings showed positive attitude of healthcare workers (Thu *et al.,* 2012). In summary, we are able to identify specific knowledge and attitude gaps to be addressed and the major issues that need emphasis during implementation of future intervention programs to raise awareness and improve capacities of healthcare providers in King Fahad Central HospitalJazan city of Saudi Arabia. The important implications for the development of coronavirus education and communication strategies suitable for improving the level of knowledge and attitude of healthcare providers about this issue and optimizing prevention programs and future research. The study show that Female were significantly more knowledgeable compared to male concerning special caution when person came with symptoms while male significantly were significantly greater knowledgeable in terms of antibiotics are first line treatment. The finding agreed with other research does not support the association of gender with the knowledge and attitude of healthcare workers (Akpodiete and Isara, 2014). Our study was found no significance difference was found between knowledge and respondent age. The study demonstrated physicians were significantly found more knowledge compared to other health care workers concerning many terms of knowledge ،the high knowledge of physicians regarding Mers COV may be returned to the high knowledge obtained from training courses they obtained in the field of diagnosed of MERS COV this agreed with many studies reported significantly the relationship of experience with knowledge and attitude (Tam *et al.,* 2007)

Conclusion

The study concluded that; health care workers in King Fahad Central Hospital Jazan city of Saudi Arabia showed good knowledge andpositive attitudes of HCWs toward MERS; however there is still need for improvement in certain areas like the cause of infection of MERS; incubation time of virus; Polymerase Chain Reaction (PCR) can be used to diagnose MERS and usedof antibiotics are first line treatment. Also extensive health education need to be expanded and variated through modern technology and internet. The study recommend strongly establish intervention to improve their knowledge and attitudes towards the infection that will reflect on the overall health of both healthcare providers and suspected or confirmed cases of coronavirus infection

Abbreviation

PHCCs	Primary health care centers
KSA	Kingdom of Saudi Arabia
USA	United States of America
OR	Odds ratio
CDC	Centers for Disease Control and Prevention
SPSS	Statistical Package for Social Sciences
χ^2	Chi Square tests
®	Registered mark
No	Number
HCWs	Health care workers
WHO	World Health Organization
MERS cov	Middle East Respiratory Syndrome Coronavirus
EMC	Erasmus Medical Center

REFERENCES

Abdullah J. Alsahafi, and Allen C. Cheng, 2016. Knowledge, Attitudes and Behaviours of Healthcare Workers in the Kingdom of Saudi Arabia to MERS Coronavirus and Other Emerging Infectious Diseases. *Int. J. Environ. Res. Public Health,* 13, 1214.

AbuabkerElbur, Abdullah Alharthi, Abdulrahman Aljuaid, Nawaf Hasan Almalki, 2016. Knowledge of Middle East Respiratory Syndrome Coronavirus (MERS-CoV) and its Management: A Survey among Saudi People in Taif; Kingdom of Saudi Arabia. *IOSR Journal Of Pharmacy,* www.iosrphr.org (e)-ISSN: 2250-3013, (p)-ISSN: 2319-4219 Volume 6, Issue 8 Version. 2, PP. 33-39.

Akpodiete A, Isara AR. 2014. Concerns about the knowledge of multi drug resistant tuberculosis among health care workers and patients in southern Nigeria. *Am J RespirCrit Care Med.,* 189:A3215.

Almutairi KM1, Al Helih EM, Moussa M, Boshaiqah AE, Saleh Alajilan A, Vinluan JM, Almutairi A. 2015. Awareness, Attitudes, and Practices Related to Coronavirus Pandemic Among Public in Saudi Arabia. *Fam Community Health.,* 38(4):332-40. And Sallahaldeen M. Alawneh (2015). Knowledge, attitude and practices of healthcare.

Arda B, Durusoy R, Yamazhan T, SipahiOR, Taşbakan M, Pullukçu H, Erdem E, Ulusoy S, 2011. Did the pandemic have an impact on influenza vaccination attitude? A survey among health care workers. *BMC Infect Dis,* 11:87.

Bener A, Al-Khal A. 2004. Knowledge, attitude and practice towards SARS. *J R Soc Promot Health,* 124:167–170.

Bermingham A, Chand MA, Brown CS, Aarons E, Tong C, Langrish C, Hoschler K, Brown K, Galiano M, Myers R, Pebody RG, Green HK, Boddington NL, Gopal R, Price N, Newsholme W, Drosten C, Fouchier RA, Zambon M. 2012. Severe respiratory illness caused by a novel coronavirus, in a patient transferred to the United Kingdom from the Middle East, September 2012. *Euro Surveill.,* 17:20290.

Brug J, Aro AR, Oenema A, De Zwart O, Richardus JH, Bishop GD. 2004. SARS risk perception, knowledge, precautions, and information sources, the Netherlands. *Emerg Infect Dis.,* 10:1486–1489.

Cauchemez S, Fraser C, Van Kerkhove MD, Donnelly CA, Riley S, Rambaut A, Enouf V, van der Werf S, Ferguson NM, 2014. Middle East respiratory syndrome coronavirus:

quantification of the extent of the epidemic, surveillance biases, and transmissibility. *Lancet Infect Dis,* 14(1):50–56.

Chor JS, Pada SK, Stephenson I, Goggins WB, Tambyah PA, Clarke TW, Medina M, Lee N, Leung TF, Ngai KL, Law SK, Rainer TH, Griffiths S, Chan PK, 2011. Seasonal influenza vaccination predicts pandemic H1N1 vaccination uptake among healthcare workers in three countries. Vaccine, 29:7364–7369.

Command and Control Centre, Ministry of Health, Saudi Arabia. http://www.moh.gov.sa/en/CCC/PublishingImages/ InfoGraph%20Images. Fact sheet. .http://www.who.int/ mediacentre/factsheets/mers-cov/en/.

Haytham M Hassan, 2016. Knowledge, Attitude, and Belief of Al-Ghad College Students toward Coronavirus Infection, Riyadh, Saudi Arabia. *International Journal of Preventive and Public Health Sciences,* Vol 1, Issue 6.

Ibrahim Awad Eljack Ibrahima, Yousef Khalaf Ali Alghamdib, 2016. Awareness, Attitude and Practices of Students Medical Sciences, Medicine and Pharmacology Colleges Towards MERS-CoV Infection: A Cross Sectional Study. *Savant Journal of Medicine and Medical Sciences,* Vol 2(6) pp. 127-141.

Jalal, S. 2015. The emerging threat of MERS. *The Journal of the Pakistan Medical Association,* 65(3), 310–311.

Khan MU, Shah S, Ahmad A, Fatokun O. 2014. Knowledge and attitude of healthcare workers about middle east respiratory syndrome in multispecialty hospitals of Qassim, Saudi Arabia. *BMC Public Health*, 14(1):1281.

Kharma, M. Y., Alalwani, M. S., Amer, M. F., Tarakji, B., & Aws, G. 2015. Assessment of the awareness level of dental students toward Middle East respiratory syndrome-coronavirus. *Journal of International Society of Preventive & Community Dentistry,* 5(3), 163.

Lessler J, Reich NG, Brookmeyer R, Perl TM, Nelson KE, Cummings DA, 2009. Incubation periods of acute respiratory viral infections: a systematic review. *Lancet Infect Dis,* 9(5):291–300.

Mohamed O. Nour, Ahmed O. Babalghith , Hatim A. Natto , Sallahaldeen M. Alawneh1 and Fowzi O. Elamin (2016). raising healthcare providers' awareness of mers-cov infection in makkah hospitals, KSA. ejpmr, 2016,3(9), 77-85.

Mohammad Alkot, Mohammed AsadAlbouq, Mahmoud Adel Shakuri, Mohanna Saleh Subahi, 2016. Knowledge, attitude, and practice toward MERS-CoV among primary health-care workers in Makkah Al-Mukarramah: an intervention study. *Int J Med Sci Public Health,* 2016; 5(5): 952-959.

Moser MS: Ethics and Saudi Arabia. CJEM 2000,2:230. 31.

Muhammad Umair Khan, Shahjahan Shah, Akram Ahmad and Omotayo Fatokun, 2014. Knowledge and attitude of healthcare workers about middle east respiratory syndrome in multispecialty hospitals of Qassim, Saudi Arabia. *BMC Public Health,* 2014, 14:1281.

Mohamed O. Nour , Ahmed O. Babilghith, Hatim A. Natto, Fowzi, 2015. AlAminand Sallahaldeen M. Alawneh. providers towards MERS-CoV infection at Makkah hospitals, KSA. *International Research Journal of Medicine and Medical Sciences,* Vol. 3(4), pp. 103-112.

Sahin , MK. Aker, S, Kaynar Tuncel, 2015. Knowledge, attitudes and practices concerning Middle East Respiratory Syndrome among Hajj Pilgrims in Samsun, Turkey , Euro surveillance, Volume 20, Issue 38.

Sallahaldeen, M. Alawneh, 2015. *Int Res J Med Med Sci.,* Vol. 3(4), pp. 103-112.

Shafi Hussain M Alqahtani andMuteb Nasser R Aldawsari, 2015. The attitudes and degree of awareness about MERS-CoV among Saudis of different ages. Clin Res Trials, Volume 1(3): 55-57.

Tam DKP, Lee S, Lee SS: Impact of SARS on avian influenza preparedness in healthcare workers. Infection 2007, 35:320–325. 29.

Thu TA, Anh NQ, Chau NQ, Hung NV. 2012. Knowledge, attitude and practices regarding standard and isolation precautions among Vietnamese health care workers: a multicenter cross-sectional survey. *Intern Med,* 2:115.

Tice, AD, Kishimoto M, Dinh CH, Tak-Kin Lam G, Marineau M. 2006. Knowledge of severe acute respiratory syndrome among community physicians, nurses, and emergency medical responders. *Prehosp Disaster Med.,* 21:183–189.

Vidyasagar G, Rea DM. 2004. Saudi women doctors: gender and careers within Wahhabic Islam and a 'westernised'work culture. *Women's Stud Int Forum,* 27:261–280. 32.

WHO, 2015. Middle East respiratory syndrome corona virus (MERS-CoV)

WHO MERS-CoV Research Group, 2013. State of Knowledge and Data Gaps of Middle East Respiratory Syndrome Coronavirus (MERS-CoV) in Humans.PLoSCurr, 5.

Zaki A. 2012. Novel coronavirus—Saudi Arabia: human isolate. Int. Soc. Infect. Dis. Available at:
http://www.promedmail.org/direct.php?id=20120920.1302733.
.

****