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Research Article

**AWARENESS AND KNOWLEDGE ABOUT MERS-COV
AMONG VISITORS OF THE PRIMARY HEALTH CENTERS, IN
TAIF CITY, KSA IN 2021**

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Abstract:

Background: MERS-CoV was firstly determined as a reason of human disease when it was first evacuated from an adult patient lung sample; this patient was admitted to a hospital in Jeddah, Saudi Arabia, with severe lungs inflammation and died then because of multi-organ failure. Several outbreaks then followed disease identification. **Study aim:** This study aimed to assess the knowledge and awareness of Middle East respiratory syndrome coronavirus (MERS-CoV) among PHC visitors in Taif city, KSA.

Methods: Cross-sectional study design was adopted to answer the research hypothesis, A self-administered questionnaire containing knowledge questions was distributed and completed by 500 participants. The research focused on five points, 1- General information regarding MERS- COV, 2- Knowledge about ways of transmission, 3- Knowledge about the symptoms of Middle East Respiratory Syndrome, 4- How to prevent the spread of this infection, 5- The groups at greatest risk of exposure to infection.

Results: The study included 500 subjects. Of all, 56% have heard about the MERS-CoV before. This was significantly associated with gender ($P=0.027$) and age ($P=0.006$). Moreover, 82.2% of participants were willing to learn more about the syndrome, which was more common among males (57.2%, $P=0.006$). Participants demonstrated a relatively good level of knowledge about transmission, causes, risk of exposure to MERS-CoV. In our study, patients were aware of prevention methods from MERS-CoV infections, as 82.4% and 87.3% regarded using facial masks in crowded places and keeping a distance from infected subjects were preventive measures, respectively. Healthcare services providers (72.6%), older people (85%), and people with weak immunity (90%) were regarded high risk groups by participants.

Conclusion: The results of this research can be used to understand the knowledge and attitude towards MERS-COV. The majority of the samples had good knowledge about the MERS-COV and the symptoms and the affecting factors. In addition, the sample showed high level of knowledge regarding the ways of transmission. Gender was a significant factor affecting the knowledge about the MERS-COV, which can represent that there is different level of knowledge regarding this infection between males and females, which can be a key factor for any future health awareness campaign about the Middle East respiratory syndrome.

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INTRODUCTION:

The Middle East respiratory syndrome (MERS) is a viral respiratory disease caused by a novel coronavirus (Middle East respiratory syndrome coronavirus, or MERS-CoV). The coronaviruses are a large family of viruses that can cause conditions ranging from the common cold to severe acute respiratory syndrome (SARS). The primary instance of Middle East respiratory disorder (MERS) was accounted for in Saudi Arabia in June 2012.[1] From that point forward, 1564 instances of MERS have been accounted for through 11 September 2015, with a casualty rate of around 35%.[2] The malady is brought about by a novel beta coronavirus of the Coronaviridae family.[3] At first, researchers speculated that the infection might be transmitted from bats. [4], [5] Nonetheless, later investigations have demonstrated a solid connection between the infection and camels.[6],[7],[8] It is currently commonly acknowledged that the two species fill in as characteristic supplies for this infection.[9]

The certain methods of transmission among animals and people and people to people stay hazy.[10] Although most human cases of MERS-CoV infections have been attributed to human-to-human infections in health care settings, current scientific evidence suggests that dromedary camels are a major reservoir host for MERS-CoV and an animal source of MERS infection in humans. Typical MERS symptoms include fever, cough, and shortness of breath. Pneumonia is common but not always present. Influenza-like manifestations and dyspnea are among the signs and side effects of the underlying introduction. Gastrointestinal symptoms, including diarrhea, have also been reported. Some laboratory-confirmed cases of MERS-CoV infection are reported as asymptomatic, meaning that they do not have any clinical symptoms, yet they are positive for MERS-CoV infection following a laboratory test. Most of these asymptomatic cases have been detected following aggressive contact tracing of laboratory-confirmed cases. In serious cases, intense respiratory disappointment, intense kidney damage, lymphocytopenia, thrombocytopenia, coagulopathy, and multi-organ disappointment have been portrayed. [11]

Approximately 35% of reported patients with MERS-CoV infection have died. Since 2012, 27 countries have reported cases of MERS, including Algeria, Austria, Bahrain, China, Egypt, France, Germany, Greece, Italy, Jordan, approximately 80% of human cases have been reported by Saudi Arabia. What we know is that people get infected there through

unprotected contact with infected dromedary camels or infected people. Cases identified outside the Middle East are usually traveling people who were infected in the Middle East and then traveled to areas outside the Middle East. [3] On rare occasions, outbreaks have occurred in areas outside the Middle East. [3, 9]

Several studies aimed to assess levels of awareness of the general public towards MERS-CoV disease. [12-20] MOH of Saudi Arabia tries to raise awareness about MERS CoV infection among the society, and so, we try in our study to evaluate that level of awareness and knowledge toward the infection among visitors who visit the primary health care centers in the city of Taif in Saudi Arabia during 2021.

Rationale:

MERS-CoV became one of the most serious viral infections worldwide, especially in the Middle East area, while the most important aspect of eradicating that infection is by increasing the education and knowledge that people are needed for it. The literature in the Kingdom of Saudi Arabia is still not enough; this study will assess awareness and knowledge of visitors of The Primary Health Centers, In Taif City, KSA in 2021.

Aim of the study:

To evaluate the awareness and knowledge of the MOH primary health care centers visitors about the Middle East respiratory syndrome (MERS -CoV) in Taif city, KSA in 2021.

MATERIALS AND METHODS:**Study design:**

Cross-sectional study.

Study population:

Patients who are visiting MOH primary health care centers in Taif city in 2021.

Study Setting:

There are MOH 19 primary health care centers at which the study was conducted.

Study Area:

Taif governorate is located in the western region of the kingdom of Saudi Arabia, specifically in Makkah province, at an elevation of 1700 meters above sea level, on the slopes of the Alsarawat mountains. The estimated population is 998000 [26].

Sample size:

The sample was calculated by using the Roasoft website. The study population is 18947 patients.

The prevalence is 50%, the confidence level is 95%, the sample size = 450 patients, and in order to account for non-response and achieve more generalized

results, the sample size will be increased to 500 patients.

Sampling Method:

A multistage random sampling technique was carried out to recruit the participants in two stages; the first stage, eight PHCCs out of PHCCs in Taif city was selected by using simple random sampling. The second stage, the study participants from each walk-in clinic in PHCs were selected using the “simple random sampling” technique. The sample was distributed over the selected centers proportionally according to the number of visitors in each selected center.

Inclusion criteria:

- Age equal to or more than 18.
- Both genders.

Exclusion criteria:

- The study excluded those who are <18 years of age, those who were unable to respond to interviews (e.g., patients who were very sick), and patients who refused to participate in the research.

Data collection method

A self-administered questionnaire was offered to all eligible participants and filled using Google form.

Data collection tool

The first part of the questionnaire is the demographic data and contains questions about age, sex, nationality, and residency status. The second part of the questionnaire is about the general knowledge about the Middle East respiratory syndrome (MERS-CoV). The third part of the questionnaire is about the knowledge of the visitor about the way of the transmission of the Middle East respiratory syndrome (MERS-CoV) infection. The fourth part of the questionnaire recognizes the knowledge of the visitor about the signs and symptoms of the Middle East respiratory syndrome (MERS-CoV). The fifth part of the questionnaire is about the knowledge of the visitor about the possible way to prevent the spread of the Middle East respiratory syndrome infection, and the last part of the questionnaire is about the knowledge of the visitor about the most and highest risk group of people in contact with the infection.

The validation was done by two family medicine consultants and one community medicine consultant.

Data management:

Collected data was coded and analyzed using the Statistical Package for Social Sciences (SPSS) version 26. Descriptive analysis was performed to present categorical data as frequencies and percentages.

Inferential statistics were done when appropriate and the threshold for statistical significance was set at p equals or less than 0.05.

Ethical considerations:

Written permission from the Program of Family Medicine, Taif Region was obtained before conducting the research. Written permission from the director of primary care, Ministry Of Health in Taif was obtained.

Permission of all primary health care centers directors was obtained. The researchers tried their best not to disturb the work in the primary health care centers; they visited all the centers after arranging with their directors. The individual consent from each subject to participate in the study is a prerequisite for data collection. Accepting to participate by filling out the questionnaire was considered consent. All information was kept confidential and was not accessed except for the purpose of the scientific research.

RESULTS:

Demographic variables:

Five hundred (500) responses were collected from the sample identified in the material and methods section; Table 1 represents the demographical variables of the sample. The majority of the sample aged between 31-49 (80%). Males were (60%) of the sample and females 40%. Nearly, all participants (99%) of the sample had the Saudi citizenship, and only 1% was non-Saudi. The majority of the sample lived in the city (71.8%), while the rest (28.2%) lived outside the cities (rural areas), and almost the whole sample lived with their families (98%).

General information regarding MERS-CoV:

The participants were asked 17 questions with closed-end answers (yes, no) to assess the general knowledge of the population regarding the MERS-COV, about 44% of the sample have not heard about the MERS-COV; however, the majority 82.2% are willing to learn more about this infection. Over a half (68%) answered no to the question regarding if this syndrome affects only the inhabitants of the Middle East and not others, and (64.6%) answered that this infection appears and disappears during these days. Over half of the sample (54%) answered that this is a new infection whose characteristics are unknown, and (68) think that this infection will increase its strength and spread in the near future, and half of the sample (55%) think that this is a seasonal infection. Table 2

Moreover, 78.2% of the sample answer that this is an infection caused by a virus, and only 64.6% think that

this infection is contagious. The majority of the sample answered that this is not a hereditary disease and thought that there is a vaccination against this disease 62%. Over a half (55.8%) think that coronavirus causes Middle East respiratory syndrome, 61.8% think that Middle East Respiratory Syndrome is transmitted through direct and indirect contact with camels, 73.6% think that it is easy to be transmitted between persons, 54.8% of the sample think that this infection is fetal, and 66% think that antibiotics are effective against the infection.

The study found a significant association between gender and having heard of MERS-CoV ($P=0.027$), having a desire to know the syndrome ($P=0.006$), thinking that the syndrome affects only the inhabitants of the Middle East ($P=0.002$), thinking that this syndrome is a new unknown disease ($P=0.002$), knowing that the cause of the of this syndrome is viral ($P=0.034$), contagious ($P=0.000$), transmitted between persons ($P=0.000$), fatal ($P=0.000$), can be treated with antibiotics ($P=0.021$). Furthermore, we found a significant association between age and having heard of MERS-CoV ($P=0.029$), having a desire to know the syndrome ($P=0.003$), thinking that the syndrome appears and disappears during these days ($P=0.001$), thinking that this syndrome is a new unknown disease ($P=0.002$), thinking that the disease will spread more in the future ($P=0.009$), thinking that the infection is considered seasonal ($P=0.003$), knowing that the cause of the of this syndrome is contagious ($P=0.013$), thinking that the syndrome is a hereditary disease ($P=0.000$), there is a vaccination against this syndrome ($P=0.018$), knowing that coronavirus is the cause of MERS-CoV ($P=0.050$), transmitted between persons ($P=0.006$), can be treated with antibiotics ($P=0.000$).

Knowledge about ways of transmission:

Table 3 shows that participants were asked six questions regarding the knowledge about the ways of transmission for MERS-COV, 76.2% think there are prior symptoms of infection ($P=0.000$, 0.003 , for association with gender, and age, respectively), however, 66.4% cannot recognize who has been infected ($P=0.006$ for association with gender), 55.8% think that it is not possible to transmit to a healthy person through sexual relations ($P=0.000$ for association with age), and the other 44.2% think that it

is possible to transmit to a healthy person through sexual relations. Moreover, 57% think that this infection cannot be transmitted during childbirth from an infected mother ($P=0.000$, 0.005 , for association with gender, and age, respectively), and 57.6% think that this infection can be transmitted between animals ($P=0.018$, 0.003 , for association with gender, and age, respectively), and 50.2% think that the source of infection is camels.

Knowledge about the symptoms of MERS-CoV:

Participants were asked regarding the symptoms of the MERS-COV syndrome, participants answered about the symptoms as the following, 89% high body temperature, 88% coughing, 75.6% runny nose, 90% shortness of breath, 82.2% respiratory failure, 76.4% joint pain, and finally 67.6% diarrhea. Gender was significantly associated with knowledge of high body temp. ($P=0.000$), coughing ($P=0.011$), shortness of breath ($P=0.000$), respiratory failure ($P=0.000$), and joint pain ($P=0.048$). Age, however, was significantly associated with coughing ($P=0.008$), runny nose ($P=0.000$), diarrhea ($P=0.004$), and joint pain ($P=0.000$).

How to prevent the spread of this infection:

Participants were asked to answer what measurements are effective in preventing the spread of the infection, using face masks is effective in crowded places (82.4%), maintain personal hygiene (61.4%, $P=0.000$ in association with gender), keep away from the infected people (87.3%, $P=0.003$, $P=0.024$, in association with gender and age, respectively).

Knowledge regarding risk of exposure:

The groups at greatest risk to exposure to infection was thought to be the health service providers (72.6%, $P=0.000$, in association with age), older people (85%, $P=0.011$, and $P=0.000$, in association with gender and age respectively), men only (22.8%, $P=0.000$, in association with gender), children only (15%, $P=0.000$, and $P=0.018$, in association with gender, and age, respectively), people with weak immunity (90%, $P=0.000$, in association with gender), travelers (62.2%, $P=0.001$, in association with gender), and people with chronic diseases (94%, $P=0.007$, in association with gender).

Table 1: Sociodemographic characters of participants (n=500).

Parameter		Frequency (%)
Age	18-30	85 (17%)
	31- 49	400 (80%)
	50-60	15 (3%)
Gender	Female	200 (40%)
	Male	300 (60%)
Citizenship	Saudi	495 (99%)
	Non-Saudi	5 (1%)
Residency	In the city	141 (28.2%)
	Outside cities	359 (71.8%)
With whom you live	Relatives	5 (1%)
	Family	490 (98%)
	Alone	5 (1%)

Table 2: General information regarding MERS-CoV (n=500).

Parameter		Frequency (%)	Sex		Age			P-value	
			Female	Male	18-30 y	31 - 49 y	50 - 60 y	Gender	Age
Have you ever heard of Middle East Respiratory Syndrome	No	220 (44%)	100 (45.5%)	120 (54.5%)	45 (20.5%)	165 (75%)	10 (4.5%)	0.027	0.029
	Yes	280 (56%)	100 (35.7%)	180 (64.3%)	40 (14.3%)	235 (83.9%)	5 (1.8%)		
Do you have the desire to know this syndrome	No	89 (17.8%)	24 (27%)	65 (73%)	25 (28.1%)	64 (71.9%)	0 (0%)	0.006	0.003
	Yes	411 (82.2%)	176 (42.8%)	235 (57.2%)	60 (14.6%)	336 (81.8%)	15 (3.6%)		
Does this syndrome affect only the inhabitants of the Middle East and not others	No	340 (68%)	120 (35.3%)	220 (64.7%)	50 (14.7%)	280 (82.4%)	10 (2.9%)	0.002	0.133
	Yes	160 (32%)	80 (50%)	80 (50%)	35 (21.9%)	120 (75%)	5 (3.1%)		
Does this infection appear and disappear during these days	No	177 (35.4%)	62 (35%)	115 (65%)	40 (22.6%)	127 (71.8%)	10 (5.6%)	0.093	0.001
	Yes	323 (64.6%)	138 (42.7%)	185 (57.3%)	45 (13.9%)	273 (84.5%)	5 (1.5%)		
Is this infection a new disease whose characteristics are unknown?	No	230 (46%)	75 (32.6%)	155 (67.4%)	25 (10.9%)	200 (87%)	5 (2.2%)	0.002	0.002
	Yes	270 (54%)	125 (46.3%)	145 (53.7%)	60 (22.2%)	200 (74.1%)	10 (3.7%)		
Do you think that the infection will increase its strength and spread in the near future	No	160 (32%)	60 (37.5%)	100 (62.5%)	30 (18.8%)	120 (75%)	10 (6.3%)	0.434	0.009
	Yes	340 (68%)	140 (41.2%)	200 (58.8%)	55 (16.2%)	280 (82.4%)	5 (1.5%)		
Is this infection considered seasonal?	No	225 (45%)	90 (40%)	135 (60%)	25 (11.1%)	195 (86.7%)	5 (2.2%)	1.000	0.003
	Yes	275 (55%)	110 (40%)	165 (60%)	60 (21.8%)	205 (74.5%)	10 (3.6%)		

Is the cause of this infection viral	No	109 (21.8%)	34 (31.2%)	75 (68.8%)	20 (18.3%)	89 (81.7%)	0 (0%)	0.034	0.112
	Yes	391 (78.2%)	166 (42.5%)	225 (57.5%)	65 (16.6%)	311 (79.5%)	15 (3.8%)		
Is Middle East respiratory syndrome contagious?	No	177 (35.4%)	47 (26.6%)	130 (73.4%)	35 (19.8%)	132 (74.6%)	10 (5.6%)	0.000	0.013
	Yes	323 (64.6%)	153 (47.4%)	170 (52.6%)	50 (15.5%)	268 (83%)	5 (1.5%)		
Do you think that the syndrome is a hereditary disease?	No	410 (82%)	165 (40.2%)	245 (59.8%)	70 (17.1%)	335 (81.7%)	5 (1.2%)	0.812	0.000
	Yes	90 (18%)	35 (38.9%)	55 (61.1%)	15 (16.7%)	65 (72.2%)	10 (11.1%)		
Do you think that there is a vaccination against this infection	No	190 (38%)	80 (42.1%)	110 (57.9%)	25 (13.2%)	155 (81.6%)	10 (5.3%)	0.452	0.018
	Yes	310 (62%)	120 (38.7%)	190 (61.3%)	60 (19.4%)	245 (79%)	5 (1.6%)		
Is corona a cause of the Middle East respiratory syndrome?	No	221 (44.2%)	91 (41.2%)	130 (58.8%)	30 (13.6%)	181 (81.9%)	10 (4.5%)	0.633	0.050
	Yes	279 (55.8%)	109 (39.1%)	170 (60.9%)	55 (19.7%)	219 (78.5%)	5 (1.8%)		
Middle East Respiratory Syndrome is transmitted through direct and indirect contact with camels:	No	191 (38.2%)	66 (34.6%)	125 (65.4%)	30 (15.7%)	156 (81.7%)	5 (2.6%)	0.051	0.755
	Yes	309 (61.8%)	134 (43.4%)	175 (56.6%)	55 (17.8%)	244 (79%)	10 (3.2%)		
The infection can be transmitted easily between persons:	No	132 (26.4%)	32 (24.2%)	100 (75.8%)	15 (11.4%)	117 (88.6%)	0 (0%)	0.000	0.006
	Yes	368 (73.6%)	168 (45.7%)	200 (54.3%)	70 (19%)	283 (76.9%)	15 (4.1%)		
There is a vaccination available against Middle East Respiratory Syndrome:	No	226 (45.2%)	86 (38.1%)	140 (61.9%)	20 (8.8%)	196 (86.7%)	10 (4.4%)	0.420	0.000
	Yes	274 (54.8%)	114 (41.6%)	160 (58.4%)	65 (23.7%)	204 (74.5%)	5 (1.8%)		
Middle East Respiratory Syndrome is a fatal infection:	No	227 (45.4%)	67 (29.5%)	160 (70.5%)	35 (15.4%)	182 (80.2%)	10 (4.4%)	0.000	0.187
	Yes	273 (54.6%)	133 (48.7%)	140 (51.3%)	50 (18.3%)	218 (79.9%)	5 (1.8%)		
Antibiotics are useful in treating this infection:	No	170 (34%)	80 (47.1%)	90 (52.9%)	15 (8.8%)	145 (85.3%)	10 (5.9%)	0.021	0.000
	Yes	330 (66%)	120 (36.4%)	210 (63.6%)	70 (21.2%)	255 (77.3%)	5 (1.5%)		

Table 3: Knowledge about ways of transmission (n=500).

Parameter		Frequency (%)	Sex		Age			P-value	
			Female	Male	18-30 y	31 - 49 y	50 - 60 y	Gender	Age
Do you think there are prior symptoms of infection?	No	119 (23.8%)	24 (20.2%)	95 (79.8%)	30 (25.2%)	89 (74.8%)	0 (0%)	0.000	0.003
	Yes	381 (76.2%)	176 (46.2%)	205 (53.8%)	55 (14.4%)	311 (81.6%)	15 (3.9%)		
Can you find out who has been infected?	No	332 (66.4%)	147 (44.3%)	185 (55.7%)	55 (16.6%)	267 (80.4%)	10 (3%)	0.006	0.936
	Yes	168 (33.6%)	53 (31.5%)	115 (68.5%)	30 (17.9%)	133 (79.2%)	5 (3%)		
Is this infection possible to transmit to a healthy person through sexual relations?	No	279 (55.8%)	114 (40.9%)	165 (59.1%)	25 (9%)	249 (89.2%)	5 (1.8%)	0.659	0.000
	Yes	221 (44.2%)	86 (38.9%)	135 (61.1%)	60 (27.1%)	151 (68.3%)	10 (4.5%)		
Is this infection transmitted during childbirth from an infected mother?	No	285 (57%)	95 (33.3%)	190 (66.7%)	35 (12.3%)	240 (84.2%)	10 (3.5%)	0.000	0.005
	Yes	215 (43%)	105 (48.8%)	110 (51.2%)	50 (23.3%)	160 (74.4%)	5 (2.3%)		
Is this infection transmitted between animals?	No	212 (42.4%)	72 (34%)	140 (66%)	50 (23.6%)	157 (74.1%)	5 (2.4%)	0.018	0.003
	Yes	288 (57.6%)	128 (44.4%)	160 (55.6%)	35 (12.2%)	243 (84.4%)	10 (3.5%)		
The source of infection is camels	No	249 (49.8%)	99 (39.8%)	150 (60.2%)	45 (18.1%)	199 (79.9%)	5 (2%)	0.913	0.375
	Yes	251 (50.2%)	101 (40.2%)	150 (59.8%)	40 (15.9%)	201 (80.1%)	10 (4%)		

Table 4: Knowledge about the symptoms of Middle East Respiratory Syndrome (n=500).

Parameter		Frequency (%)	Sex		Age			P-value	
					18-30 y	31 - 49 y	50 - 60 y		
			Female	Male				Gender	Age
High body temperature	No	55 (11%)	10 (18.2%)	45 (81.8%)	5 (9.1%)	50 (90.9%)	0 (0%)	0.000	0.080
	Yes	445 (89%)	190 (42.7%)	255 (57.3%)	80 (18%)	350 (78.7%)	15 (3.4%)		
Coughing	No	60 (12%)	15 (25%)	45 (75%)	5 (8.3%)	50 (83.3%)	5 (8.3%)	0.011	0.008
	Yes	440 (88%)	185 (42%)	255 (58%)	80 (18.2%)	350 (79.5%)	10 (2.3%)		
Runny nose	No	122 (24.4%)	52 (42.6%)	70 (57.4%)	25 (20.5%)	87 (71.3%)	10 (8.2%)	0.496	0.000
	Yes	378 (75.6%)	148 (39.2%)	230 (60.8%)	60 (15.9%)	313 (82.8%)	5 (1.3%)		
Shortness of breath	No	50 (10%)	0 (0%)	50 (100%)	10 (20%)	40 (80%)	0 (0%)	0.000	0.375
	Yes	450 (90%)	200 (44.4%)	250 (55.6%)	75 (16.7%)	360 (80%)	15 (3.3%)		
Respiratory failure	No	89 (17.8%)	19 (21.3%)	70 (78.7%)	15 (16.9%)	74 (83.1%)	0 (0%)	0.000	0.184
	Yes	411 (82.2%)	181 (44%)	230 (56%)	70 (17%)	326 (79.3%)	15 (3.6%)		
joint pain	No	118 (23.6%)	38 (32.2%)	80 (67.8%)	35 (29.7%)	83 (70.3%)	0 (0%)	0.048	0.000
	Yes	382 (76.4%)	162 (42.4%)	220 (57.6%)	50 (13.1%)	317 (83%)	15 (3.9%)		
Diarrhea	No	162 (32.4%)	72 (44.4%)	90 (55.6%)	20 (12.3%)	132 (81.5%)	10 (6.2%)	0.160	0.004
	Yes	338 (67.6%)	128 (37.9%)	210 (62.1%)	65 (19.2%)	268 (79.3%)	5 (1.5%)		

Table 5: How to prevent the spread of this infection (n=500).

Parameter		Frequency (%)	Sex		Age			P-value	
					18-30 y	31 - 49 y	50 - 60 y		
			Female	Male				Gender	Age
Use of face mask in crowded places	No	88 (17.6%)	43 (48.9%)	45 (51.1%)	20 (22.7%)	63 (71.6%)	5 (5.7%)	0.062	0.062
	Yes	412 (82.4%)	157 (38.1%)	255 (61.9%)	65 (15.8%)	337 (81.8%)	10 (2.4%)		
Maintain personal hygiene	No	193 (38.6%)	118 (61.1%)	75 (38.9%)	25 (13%)	163 (84.5%)	5 (2.6%)	0.000	0.136
	Yes	307 (61.4%)	82 (26.7%)	225 (73.3%)	60 (19.5%)	237 (77.2%)	10 (3.3%)		
Keep away from infected people	No	65 (13%)	15 (23.1%)	50 (76.9%)	5 (7.7%)	60 (92.3%)	0 (0%)	0.003	0.024
	Yes	435 (87%)	185 (42.5%)	250 (57.5%)	80 (18.4%)	340 (78.2%)	15 (3.4%)		

Table 6: The groups at greatest risk of exposure to infection (n=500).

Parameter		Frequency (%)	Sex		Age			P-value	
			Female	Male	18-30 y	31 - 49 y	50 - 60 y	Gender	Age
Health service providers	No	137 (27.4%)	52 (38%)	85 (62%)	30 (21.9%)	97 (70.8%)	10 (7.3%)	0.567	0.000
	Yes	363 (72.6%)	148 (40.8%)	215 (59.2%)	55 (15.2%)	303 (83.5%)	5 (1.4%)		
Older people	No	75 (15%)	20 (26.7%)	55 (73.3%)	15 (20%)	45 (60%)	15 (20%)	0.011	0.000
	Yes	425 (85%)	180 (42.4%)	245 (57.6%)	70 (16.5%)	355 (83.5%)	0 (0%)		
Men only	No	386 (77.2%)	181 (46.9%)	205 (53.1%)	65 (16.8%)	311 (80.6%)	10 (2.6%)	0.000	0.595
	Yes	114 (22.8%)	19 (16.7%)	95 (83.3%)	20 (17.5%)	89 (78.1%)	5 (4.4%)		
Children only	No	425 (85%)	190 (44.7%)	235 (55.3%)	65 (15.3%)	345 (81.2%)	15 (3.5%)	0.000	0.018
	Yes	75 (15%)	10 (13.3%)	65 (86.7%)	20 (26.7%)	55 (73.3%)	0 (0%)		
People with weak immunity	No	50 (10%)	5 (10%)	45 (90%)	10 (20%)	40 (80%)	0 (0%)	0.000	0.375
	Yes	450 (90%)	195 (43.3%)	255 (56.7%)	75 (16.7%)	360 (80%)	15 (3.3%)		
Travelers	No	189 (37.8%)	94 (49.7%)	95 (50.3%)	30 (15.9%)	149 (78.8%)	10 (5.3%)	0.001	0.061
	Yes	311 (62.2%)	106 (34.1%)	205 (65.9%)	55 (17.7%)	251 (80.7%)	5 (1.6%)		
People with chronic diseases	No	30 (6%)	5 (16.7%)	25 (83.3%)	5 (16.7%)	25 (83.3%)	0 (0%)	0.007	0.605
	Yes	470 (94%)	195 (41.5%)	275 (58.5%)	80 (17%)	375 (79.8%)	15 (3.2%)		

DISCUSSION:

MERS-CoV was firstly determined as a reason of human disease when it was first evacuated from an adult patient lung sample; this patient was admitted to a hospital in Jeddah, Saudi Arabia, with severe lungs inflammation and died then because of multi-organ failure. The following retrospective study then relates MERS-CoV to a previous outbreak in April 2012 in Jordan. MERS-CoV is a zoonotic disease. The animal cause of transmitting the infection to humans is the dromedary camels. SARS-CoV was holden in a year after its prevalence, unlike it MERS- CoV keeps spreading and causing human disease with uncautious individual cases, society clusters, with nosocomial prevalence in the Middle East, and a substantial potential of expansion globally. [1, 18]

Many human-to-human transmissions of MERS-CoV have happened. South Korea had the biggest prevalence outside the Middle East in 2015. This prevalence was linked to a great ratio of morbidity and mortality, and it also had so many effects on social, economic, and health security.

This study aimed to assess the knowledge and awareness of MERS-CoV among PHC visitors in Taif city, KSA. The study included 500 subjects. Of all, 56% have heard about the MERS-CoV before. This was significantly associated with gender ($P=0.027$) and age ($P=0.006$). Moreover, 82.2% of participants were willing to learn more about the syndrome, which was more common among males (57.2%, $P=0.006$).

Participants demonstrated a relatively good level of knowledge about transmission, causes, risk of exposure to MERS-CoV. There has been several studies focused on this topic, Al Mohaisse in 2017 study aimed to measure the awareness level of corona-virus that causes MERS-CoV among faculty members at one of the women's university in the kingdom of Saudi Arabia and its employees and students after the occurrence of virus local outbreak. The overall knowledge score was 43.2% and the percentage was high only among the participants from the health institute 50.6%, and most of the respondents acknowledged the usual symptoms of corona virus, which causes MERS-CoV, however, 67.1% of them knew the recommended precautions that should be applied when dealing with patients [3].

Similar Saudi studies have been conducted among student population, as one conducted by Alqahtani 2017 [6], concluded that the students were aware of the clinical aspects of the MERS-CoV but had a lack of awareness about the basic sciences and there was a need for additional training and educational programs. Students were very aware of the clinical aspects of the MERS virus, including diagnosis, treatment, transmission methods, and prevention. However, there was a significant difference between health colleges students in terms of their understanding of the basic sciences of this virus [6].

In our study, patients were aware of prevention

methods from MERS-CoV infections, as 82.4% and 87.3% regarded using facial masks in crowded places and keeping a distance from infected subjects were preventive measures, respectively.

Healthcare services providers (72.6%), older people (85%), and people with weak immunity (90%) were regarded high risk groups by participants.

A study was conducted among Bahraini subjects concluded that the awareness and knowledge of the participants in the questionnaire in Bahrain about MERS virus was not sufficient despite the visit of about 95% of Bahrain's population to Saudi Arabia. In this study, face-to-face interviews were conducted with the participants and an arabic questionnaire was used during an interview. The percentage of the population who had knowledge and awareness about the disease and the fact that its fatal viral disease with its accompanying symptoms was 50%. According to the socio-demographic segmentation, the researcher found that the level of education, profession, and history of travel to Saudi Arabia are significantly related to awareness and knowledge of the MERS ($P < 0.05$). The profession and travel history to Saudi Arabia were also associated with the preventive measures of the mers ($P < 0.05$) [17].

Study limitations:

Adherence of the patients to visit the primary health care center regularly, consent of the patients to participate in the research. The cross-sectional design is subjected to unavoidable recall bias. However, we tried to minimize it by using a validated scales such as the hill bone scale.

CONCLUSION:

The results of this research can be used to understand the knowledge and attitude towards MERS-COV. The majority of the samples had good knowledge about the MERS-COV and the symptoms and the affecting factors. In addition, the sample showed high level of knowledge regarding the ways of transmission. Gender was a significant factor affecting the knowledge about the MERS-COV, which can represent that there is different level of knowledge regarding this infection between males and females, which can be a key factor for any future health awareness campaign about the Middle East respiratory syndrome.

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