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Research Article

**KNOWLEDGE, ATTITUDE AND PRACTICE OF MIDDLE
EAST RESPIRATORY SYNDROME CORONA VIRUS (MERS-
CoV), AMONG MALE PRIMARY SCHOOL STUDENTS IN
ALMAJMAAH CITY, SAUDI ARABIA**

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Abstract:

Background: Coronavirus is a disease that affects the respiratory system and is becoming global health problem that is originally detected in KSA with a progressive increase in cases and deaths.

Objective: to determine the knowledge, attitude, and practice of Middle East Respiratory Syndrome Coronavirus (MERS-CoV) amongst male primary school students in Almajmaah City, Saudi Arabia, 2017.

Methods: It is an observational cross-sectional study, in which 384 participants representing students from different schools were included in the study. The data was collected using interview questionnaires drawn by the researchers. The data then were analyzed by the use of the Statistical Package for Social Sciences (SPSS).

Results: The average of the knowledge of the students is 37.5% and this result indicates a poor knowledge. Concerning attitude, the sum percentage of the correct answers was 52.04%, which indicates that the attitude of the male primary students in Almajmaah city is almost in the minimum acceptable range.

Conclusion: The study showed that there were a knowledge gap, a negative attitude and a poor practice amongst primary school students in Almajmaah towards MERS-CoV infection.

Keywords: Corona, infectious, URTI, Al Majmaah, KAP.

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INTRODUCTION:

Coronavirus is a disease that affects the respiratory system. It spreads in the same way as other cold viruses do. This can either be through infected people coughing and sneezing, by touching an infected person's contaminated hands or face, or by touching contaminated things such as doorknobs that infected people have touched, also the presence in overcrowded areas increases the risk of transmission of infection. The symptoms of most coronaviruses are similar to any other respiratory infection including a runny nose, coughing, sore throat, and sometimes fever. In most cases, people won't know whether they have a coronavirus or a different cold-causing virus, such as rhinovirus. Lab tests include culture from nose and/or throat and blood work up are necessary to find out whether it is cold from coronavirus or not [1].

One type of novel corona virus was reported in Saudi Arabia in September 2012, and the case was about a man who was admitted to the hospital with pneumonia and acute kidney injury in June 2012 [2]. A few days earlier, another case was reported with the identical virus; the patient suffered from acute respiratory syndrome and kidney injury [3].

Another study showed that MERS-CoV infects lower respiratory tract, kidney, intestinal and liver cells, as well as histiocytes [4]. Another study reported that human bronchial epithelial cells are susceptible to infection [5]. It was initially termed human coronavirus-EMC (for Erasmus Medical Center), then it has been renamed Middle East respiratory syndrome coronavirus (MERS-CoV) [6].

MERS-CoV also infects nonhuman primate, porcine, bat, civet, rabbit, and horse cell lines [4]. After analysis of MERS-CoV obtained from 21 infected patients in Saudi Arabia between June 2012 and June 2013, there was adequate heterogeneity to help different separate creature to adopt human exchanges [7].

The first identified and reported MERS-CoV case by WHO was in September 2012 and in January 2015, 956 laboratory cases of MERS-CoV were confirmed by the WHO, in which at least 351 patients died because of it. All reported cases were directly or indirectly linked to travelling to - or to the residents of nine countries namely; Saudi Arabia, the United Arab Emirates, Qatar, Jordan, Oman, Kuwait, Yemen, Lebanon, and Iran [8].

In the United States, two patients' investigations were positive for MERS-CoV in May 2014, every one of

them had a background marked by fever and at least one respiratory side effects after late travel from Saudi Arabia [9].

Health authorities always declare the methods that help decrease transmission of infections as hand washing which is the most ordinarily detailed strategy for insurance against the disease and also utilizing tissues when sniffing and hacking and appropriate tissue transfer may help to prevent its transmission. [10]

Contamination avoidance and control measures are basic to keep the conceivable spread of MERS-CoV in human services offices. It isn't constantly conceivable to distinguish patients with MERS-CoV early because like other respiratory diseases, the early side effects of MERS-CoV are non-explicit. Consequently, human services laborers ought to dependably apply standard precautionary measures reliably with all patients, paying little mind to their finding. The high risk individuals for developing serious illness and complications from corona virus infection are those with diabetes, renal failure, chronic lung disease, and immunocompromised persons. So, nourishment and cleanliness practices have to be watched. Individuals ought to abstain from drinking crude camel drain or camel pee, or eating meat that has not been legitimately cooked. [10].

No vaccine or explicit treatment is as of now accessible. The only treatment that is available so far is supportive and based on the patient's clinical condition. So, prevention is a very important step in health education [5].

MATERIALS AND METHODS:

It is an observational cross-sectional study conducted in Almajmaah city which has a population of 73,000. The city belongs to the Riyadh region; there are 21 male primary schools in the city in which 1625 of all the students are in the senior years (fourth, fifth and sixth year). The sample size for this research was 384 person according to the formula $N = Z^2 \times PQ / D^2$

Ten schools were chosen randomly, and from each school, about 38 students were selected randomly from the higher classes (the 4th, 5th, and 6th), and the total number collected was 384 students. Ethical clearance was obtained from the ethical research committee at Almajmaah University, and an informed consent was obtained from the school authority, represented by the principle himself, prior to participation in the study with brief explanation on the objectives and benefits of the study with emphasis that personal data would be confidential and used for the scientific work only. An interview questionnaire

was drawn by researchers after a thorough search of literature based on the most recent and available information.

The questionnaire is formed 34 questions present in appendix A, arranged into five parts written in English and translated into Arabic, the first part include three questions about personal data including name, age, nationality. The second part is formed of nine questions to know the knowledge of students. The third part is formed of 5 questions to know the attitude of students. The fourth part is formed of 8 questions to know the practice of students and the

fifth part is formed of 9 questions about the source of information about corona virus.

RESULTS:

The results about knowledge of the students about the corona virus showed that; 252 (65.6%) of students knew that MERS-CoV could be transmitted by coughing and sneezing, 110 (28.6%) equally agreed that the virus is transmitted by touch and 92 (24%) agreed that only humans are affected by the virus, the average of the knowledge which is (37.5%) indicate a poor knowledge, as shown in table 1.

Table 1: General knowledge of students about MERS-CoV

Knowledge	Yes	No	I don't Know
Is MERS-CoV transmitted by coughing and sneezing?	252 (65.6%)	17 (4.4%)	115 (30 %)
Is MERS-CoV is transmitted by touch?	110 (28.6%)	136 (35.4%)	138 (35.9%)
Does it affect only humans?	92 (24%)	155 (40.4%)	137 (35.7%)
If not, does transmission occur between animals and humans?	97 (25.3%)	38 (9.9%)	51 (13.3%)
Is MERS-CoV transmitted by animal products (milk and meat)?	67 (17.4%)	55 (14.3 %)	66 (17.2%)
If yes for the previous question. Is it transmitted in well-cooked products?	23 (6%)	42 (10.9%)	26 (6.8%)
Do you think MERS-CoV is a dangerous disease	323 (84.1%)	31 (8.1%)	40 (7.8%)

For their attitude towards this virus, the results showed that; 294 (76.6%) students agreed on the importance of reporting suspected cases to the authorities. As regards to the importance of using a mask in crowded areas, 292 (76%) students agreed to the use while 220 (76%) students thought corona is preventable as shown in Table 2. Concerning attitude the sum percentage of the correct answers was 52.04%, which indicates that the attitude of the male primary students in Al Majmaah city is almost in the minimum acceptable range.

Table 2: Attitude of students towards MERS-CoV

Attitude	Agree	Uncertain	Disagree
Is it important to report a suspected case to health authorities?	294 (76.6%)	56 (14.6%)	34 (8.9%)
Is it important to use a face mask in crowded place (In performing umrah, stadiums)?	292 (76%)	56 (14.6%)	36 (9.4%)
Is Corona infection preventable?	220 (76%)	111 (28.9%)	53 (13.8%)
Can Corona infection be treated at home?	74 (19.3%)	96 (25%)	214 (55.7%)
Health education has nothing to do with disease prevention(In T.V, brochures, symposiums)	116 (30.2%)	97 (25.3%)	171 (44.5%)

As for practice of students towards preventive measures against corona virus; 206 (53.6%) students cover their face with tissue while coughing and sneezing, 222 (57.8%) students wash their hands with water and soap constantly while 165(43%) students avoid touching their eyes, nose, and mouth. 177 (46.1%) students keep on eating healthy food and living a healthy lifestyle regardless of their hand hygiene as indicated in figure 1.

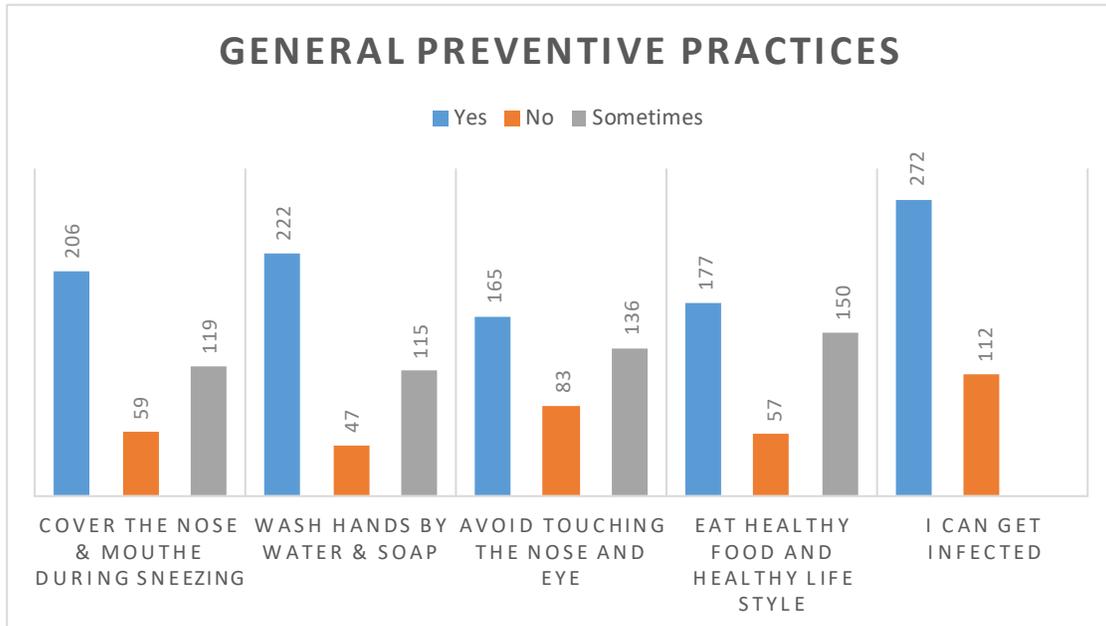


Figure 1: practice of students towards preventive measures against corona virus.

It was detected that there were no significant associations observed between Knowledge and TV as a source, $p=0.539$ as shown in table 3.

Table 3: relation between level of Knowledge and television (TV) as a source of it

KNOWLEDGE	T.V		TOTAL
	Yes N (%)	No N (%)	
POOR	150 (57.5)	111 (42.5)	261 (100)
GOOD	54 (62.8)	32 (37.2)	86 (100)
VERY GOOD	16 (48.5)	17 (51.5)	33 (100)
EXCELLENT	2 (50)	2 (50)	4 (100)
TOTAL	222 (57.8)	162 (42.2)	384 (100)
PEARSON CHI SQUARE =2.164 , P=.539			

Also, we found that there was no significant association observed between the level of knowledge and internet and social media as a source of it, $p= 0.983$ as indicated in table 4.

Table 4: relation between the level of knowledge internet and social Media as a source of it.

KNOWLEDGE	INTERNET AND SOCIAL MEDIA		TOTAL N (%)
	Yes N (%)	No N (%)	
POOR	122 (46.7%)	139 (53.3%)	261 (100%)
GOOD	42 (48.8%)	44 (51.2%)	86 (100%)
VERY GOOD	15 (45.5%)	18 (54.5%)	33 (100%)
EXCELLENT	2 (50%)	2 (50%)	4 (100%)
TOTAL	181 (47.1%)	203 (52.9%)	384 (100%)
CHI-SQUARE=0.167, P= 0.983			

DISCUSSION:

To our knowledge, this study is the first attempt to measure the knowledge, attitude and practice of MERS-CoV amongst primary school students especially among the higher classes (fourth, fifth, and sixth grades), in the city of Al Majmaah.

In general, our results showed relatively poor knowledge, accepted attitude and reported poor practices towards MERS-CoV. We can explain such negative results by that the students have not gotten any health education about MERS-CoV and it's not a part of their curriculum at their school.

These findings correspond with the recently published study that was done by **Nour et al**, in Makkah region [11] that was done among health care workers, and the study reported poor knowledge, negative attitude and good practice towards the infection. Regarding our study, the total level of knowledge was found poor among 68 % of the students and it was 67.6% in Makkah study, and good to excellent among the remaining 32 % (32.4 % in Makkah).

The practice was poor amongst a majority of the students (64%) in our study, while it was good among the majority of the health care workers (87.9%) according to Nour et al. [11] this difference may be due to the difference in the study population.

The general attitude was acceptably positive among the students (52.04%). The most positive attitude was observed when students agreed on the importance to report a suspected case to health authorities, and Corona infection is preventable which agrees with Nour et al [11] study in Makkah. According to the results, we can see an appreciable knowledge of the

disease and practices whereby a majority of the students wash their hands frequently.

On the other hand, a negative attitude was observed from the results when the students disregarded health education as a tool in preventing the disease. This result disagrees with the study that was done in Makkah by Nour et al [11], and this disagreement can be explained by emphasizing the awareness programs by the health authorities on such issues regarding infection education and also may be ascribed to the cumulative experience from continuous exposure of healthcare providers to cases related to the respiratory disease.

There are many studies that detect the level of knowledge about corona virus but among the participants in Hajj and Umrah from outside Saudi Arabia as that was done in turkey by Sahin Mustafa et al. [12] that showed more than half of the prospective pilgrims had never heard of MERS similar to our study that showed also low knowledge among participating students. Another study done in France by Gautret et al. [13] showed that 65% of French pilgrims know well about MERS.

There is another study that was done among the Australian pilgrims by Tashani et al. [14] that showed that 35% of them know well about corona virus. Most of those who have knowledge about corona virus, have learned of it through newspapers or television. [15]

CONCLUSION:

In conclusion, the study showed that there were a knowledge gap, slightly accepted attitude and a poor practice amongst primary school students in Almajmaah towards MERS-CoV infection. So, the

recommendations are Continuous strengthening of the necessary health educational programs are needed to improve their knowledge and change their attitudes toward infection. This will be in the interest of global and public health, to include health education in the curriculum, to use different media tools for health education and to utilize social media in empowering health education.

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PART 1:

PERSONAL DATA		المعلومات الشخصية	
NAME			الإسم
AGE			العمر
NATIONALITY			الجنسية

PART 2:

knowledge	Yes نعم	No لا	Sometime احيانا	I don't Know لا اعلم	المعرفة
is MERS-CoV transmitted by cough and sneeze					هل تنتقل العدوى عن طريق السعال و العطاس
is MERS-CoV is transmitted by touch					هل تنتقل العدوى عن طريق اللمس
Does it affect only man kind ?					هل العدوى تصيب البشر فقط
If no, does transmit between animals and humans?					اذا كانت الاجابة لا، هل تنتقل العدوى بين الحيوانات والبشر
is MERS-CoV transmitted by animal products (milk and meat)					هل تنتقل العدوى عن طريق المنتجات الحيوانيه
If yes for previous question. Is it transmitted in well cooked products?					اذا كانت الاجابه نعم، هل تنتقل عن طريق الاكل المطهو جيدا
Do you think MERS-CoV is a dangerous disease					هل تعتقد ان كورونا مرض خطير
knowledge	الجمال Camels	الخفافيش Bats	الأغنام Sheep		المعرفة
What is the animal that caused spread of the infection					ماهو الحيوان المتسبب في انتشار العدوى بين البشر
knowledge	الرئتين Lungs	المعدة Stomach	القلب Heart		المعرفة
What is the affected organ					ماهو العضو الذي يصاب بالفيروس

PART 3:

Attitude	أوافق Agree	غير متأكد Uncertain	لا اوافق Disagree	السلوك
Is it Important to report a suspected case to health authorities				هل تؤمن بأهمية الإبلاغ عن الحالات المشتبه بها للمسؤولين؟
Is it Important to use face mask in crowded place(In performing omra, stadiums)				هل هناك اهمية لإستخدام الكمامة في الاماكن المزدحمة (اثناء العمرة، في المدرجات..)
Corona infection is preventable				هل يمكن الوقاية من التعرض لعدوى فيروس كورونا
Corona infection can be treated at home				هل يمكن علاج عدوى فيروس كورونا في المنزل
Health education has nothing to do with disease prevention(In T.V, brochures, symposiums)				التوعية الصحية لا تساهم بأي شكل من الاشكال في الحد من انتشار العدوى (في التلفزيون، كتيبات، ندوات)

PART 4:

Practices	نعم Yes	لا No	أحيانا Sometimes	الممارسات \ التصرف
Cover my nose and mouth with a tissue during sneezing or coughing and Throw the used tissue in the trash				اغطي انفي وفمي بمنديل اثناء العطاس و السعال، واقوم برمي المنديل في حاوية القمامة.
Use soap and water to wash my hands continuously				أستخدم الماء و الصابون لغسل يدي باستمرار
Avoid touching my eyes, nose or mouth as far as I can				اتجنب لمس عيني او انفي او فمي أقصى ما يمكن

Keep on healthy eating and health styles					احافظ على الاكل الصحي و الاساليب الصحية.
Practices	عيادات خاصة Private clinic	عيادة او مستشفى حكومي Governmental hospital or clinic	طبيب شعبي Traditional healer		الممارسات \ التصرف
When you get sick, where do you seek treatment at					عادة، عندما تمرض تتلقى العلاج في \ عند
Practices	نعم Yes	لا No	السبب Because		الممارسات \ التصرف
Do you think you can get MERS-CoV					هل تعتقد انك معرض للاصابة بفايروس كورونا
Practices	طبيب او ممارس صحي Doctor or health worker	الوالدان Parents	صديق مقرب Close friend	اخرى others	الممارسات \ التصرف
Who'd you talk to if you had the illness					ستتحدث لمن اذا كان لديك المرض
Practices	اتعاطف معهم وارغب بمساعدتهم I feel compassionate & desire to help	اتعاطف معهم ولكن ابقى بعيد منهم I feel compassionate But tend to stay away	مشكلتهم ولا أستطيع ان اصاب به it's their problem and I cannot get the disease	اخشاهم لانه من المحتمل ان يعدوني I fear them because they might infect me	الممارسات \ التصرف
Who'd you talk to if you had the illness					ما هو شعورك تجاه المصابين بفايروس كورونا

PART 5:

Source of knowledge	نعم Yes	لا No	مصدر المعلومة
T.V			التلفاز
Radio			الراديو
Newspaper			الصحف اليومية \ الجرائد
Family, Neighbors or friends			العائلة او الجيران او الاصدقاء
Doctors			الاطباء
Health educator			المربي الصحي
Teachers			المعلمين
Internet & social media			الانترنت و وسائل التواصل الاجتماعي
Other			اخرى