

Knowledge and attitude of Al-Ghad college students towards corona virus infection

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Abstract

Objective: This study was conducted to identify the knowledge, attitudes and beliefs towards Corona virus infection among students in Al-Ghad International College for Applied Medical Science in Riyadh Male Campus. **Methods:** Using a descriptive cross-sectional method, data were collected from 220 sample students, using a simplified, structured, self-administered questionnaire, including closed questions completed by students in their classes. **Results:** The findings indicate that most students gave correct answers to questions related to disease prevention and control while the lowest percent was observed in questions related to mode of transmission, whereas questions related to the general knowledge about corona virus and the clinical picture of disease have intermediate percents of correct answers. Students' knowledge status was positively associated with their age category. Most of the students get their information about the corona virus from websites (internet) followed by TV and friends. Also, most of the students agreed that corona is a fatal virus and it's dangerous to the community, diseased people must be isolated, health education campaigns decrease the virus transmission and the necessary measures for disease control were taken by the responsible authority. **Conclusion:** This study gives an idea about the effect of interventional activities against corona virus infection and areas that needs further efforts to control the spread of the virus transmission.

Keywords: Alghad College; Attitude; Corona virus; Knowledge.

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Introduction

Middle East respiratory syndrome (MERS) is a new human disease first reported from Saudi Arabia in September, 2012, after identification of a novel coronavirus (CoV) from a male Saudi-Arabian patient who died from severe respiratory illness in June, 2012 [1]. Immediately after that, the disease appeared in other Arab peninsula countries as Qatar, UAE, Kuwait, and then spread to middle east and non middle east countries [2]. However, the majority of cases (~85%) have been reported from KSA [3].

Until the fourth of October 2015, total number of confirmed cases of corona infection in KSA was 1251. Of these cases 536 died (case fatality rate 42.8%) [4]. There is a progressive increase in the number of cases and number of deaths in KSA, where five cases reported in 2012, 160 in 2013, 664 in 2014 and 377

cases until the end of August 2015. However, case-fatality rate (CFR) showed a progressive decrease where it was 60% in 2012, 51% in 2013 and 41% in 2014 and 2015 [5].

All cases reported from outside the Middle East have a history of recent travel to the Middle East or linked to a case of traveling history [3]. On May 20, 2015, the Republic of Korea (Korea) reported to WHO a case of laboratory-confirmed MERS-CoV infection, the first case in what is now the largest outbreak of MERS-CoV outside of the Arabian Peninsula. The primary case is a 68-year-old male who travelled to Bahrain, United Arab Emirates (UAE), Kingdom of Saudi Arabia (KSA), and Qatar, prior to returning to Korea on May 4. Since then, as of June 10, 107 additional laboratory-confirmed cases of MERS-CoV have been identified according to the Republic of Korea Ministry of Health, for a total of 108 cases, including nine deaths; WHO has confirmed 64 of these cases and five deaths [6].

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Since the beginning of 2015 and as of 10 June, Saudi Arabia has reported 201 cases of MERS-CoV. Of these cases, sixty-seven (34%) were reported as resulting from secondary transmission; 42 of the 67 were classified as nosocomial transmission; twenty-three (11%) were identified as healthcare workers; for nineteen of the 23 healthcare workers, there were indications of nosocomial transmission; twenty-six (18%) reported animal contact, 18 of the 26 cases reported direct contact with camels; eighteen (9%) reported to have drunk camel milk [2]. However, there is no evidence of widespread person-to-person transmission of MERS-CoV. Where it has been suspected that the virus has been transmitted from person to person, it appears that there had been close contact between somebody who was sick and another person: a family member, a fellow patient or a health care worker [7].

From 47 individuals (46 adults, one child) with laboratory-confirmed MERS-CoV disease were identified; 36 (77%) were male (male: female ratio 3.3:1). 28 patients died, a 60% case-fatality rate. The case-fatality rate rose with increasing age. Only two of the 47 cases were previously healthy; most patients (45 [96%]) had underlying comorbid medical disorders, including diabetes (32 [68%]), hypertension (16 [34%]), chronic cardiac disease (13 [28%]), and chronic renal disease (23 [49%]). Common symptoms at presentation were fever (46 [98%]), fever with chills or rigors (41 [87%]), cough (39 [83%]), shortness of breath (34 [72%]), and myalgia (15 [32%]). Gastrointestinal symptoms were also frequent, including diarrhea (12 [26%]), vomiting (ten [21%]), and abdominal pain (eight [17%]) [8].

Ministry of health in KSA has responded to this outbreak by releasing a health education program about corona virus, including modes of transmission, clinical manifestation of infection and methods of prevention and control. Identification of student's knowledge and attitude about Corona virus infection was considered a beneficial action to evaluate the effectiveness of this health education program.

Methodology

Study Setting: The study was conducted in Al-Ghad International College for Applied Medical Science, Riyadh-Male Campus, which is one of the branches of Al-Ghad group with 12 colleges distributed in the different cities of Saudi Arabia. The duration of the

study in this college is four years. The first year is a preparatory year. After that, students complete the following three years into one of five specialties (emergency medicine, medical imaging, clinical laboratory, nursing and health administration). Saudi and non-Saudi students are studying in this college.

Study design and sampling: This study was a descriptive cross-sectional conducted during the academic year 2014-2015. The target population was all students studying in the college, whether full or part-time students. Based on the available data from the Registration department, which reported that an estimated 500 students are studying in the college, the sample size was calculated using *Epi-Info*, version 7.0, considering the following criteria: population size of 500; the proportion of students who had accurate knowledge and held positive attitudes about Corona virus was assumed to be 50%. The sample size required for the study with 95% confidence level was 217 students. Based on this estimation, the study selected 220 students from the different departments to proceed with data gathering. Cluster sampling was carried out where all students in the selected classes were recruited for the study. Class selection was done randomly and based on the availability and the acceptance of class instructor for the research team to conduct the study.

Questionnaire: The study was conducted by using a simplified, structured, self-administered questionnaire, including closed questions completed by students in their classes. A questionnaire was constructed to meet the purpose of study after review of knowledge, believe and attitude studies conducted in different countries.

The questionnaire of the study was divided into four sections:

- Section I consisted of questions on socio-demographic characters of students, which include age, marital status, department of study (preparatory, emergency medicine, medical imaging, clinical laboratory, nursing and health administration), residence, nationality and the educational level of the parents.
- Section II consisted of questions on the knowledge of students about corona virus (21 questions). This includes general knowledge about corona virus, mode of transmission, symptoms and signs and prevention and control. For each question, there were three possible options yes, no and don't know. Correct answer was considered if a suitable answer was given for each question (either yes

or no). Students were asked to mark the correct answer for each question or don't know option if they had no information. For each question, 1 point was awarded for a correct answer and 0 points for an incorrect choice or no response. Total knowledge scores for each student, therefore, ranged from 0–27. Students with higher scores had more knowledge about corona virus infection than students with low knowledge.

- Section III included questions about attitude and beliefs (15 questions). For each question, there were three possible options agree, disagree and neutral.
- Section IV included questions about sources of information about corona virus, their accuracy and the information they need.

The questionnaire was tested on 20 students and was refined accordingly. No substantial difficulties were encountered during the testing and only minor corrections were made. The participants of the pilot study were not included in the final analysis.

Data collection: Before data collection, class instructor and students were approached at the beginning of each session and given a brief explanation of the study. Data collection starts only after obtaining oral permission from the class instructor and students. If the students had any inquires, they were encouraged to ask a member of the research team. During questionnaires collection, the researcher checked that all questions had been answered and returned any questionnaires with

Results

The students' ages ranged from 18-38 years, with mean and SD 22.5 ± 3.4 years, and the majority of students were single (86.8%) and residing in Riyadh (83.2%).

Table (1) shows the number and percent of true, false and don't know answers of students regarding certain questions concerning corona virus (general knowledge, mode of transmission, clinical picture and prevention and control). The highest percent of correct answers were observed in questions related to prevention and control (92.5, 88.2, 86.9, 78.0, 45.3 and 37.4) while the lowest percent was observed in questions related to mode of transmission (7.3, 22.4, 26.0, 57.5, 59.4, and 84.9) whereas questions related to the general knowledge about corona virus and the clinical picture of disease have intermediate percents of correct answers.

Table (2): shows the relation between students mean total knowledge score and certain socio-demographic characters. Significant differences were observed between student's mean total knowledge score regarding their age category and college department (P value=0.000 and 0.001 respectively). On the other side, there is no significant difference between students mean total knowledge score regarding father or mother educational status (P value=0.484 and 0.808 respectively), however, the lowest means total knowledge scores were recorded for students of illiterate father and students of illiterate mother.

missing information for the students to complete it. Duration of questionnaire filling by participants ranged from 20-30 minutes.

Ethical considerations: Written permission to carry out the study was obtained from the dean of the college. The questionnaire was administered to those who gave their verbal consent to participate. Participation was voluntary after explaining the purpose of study. The questionnaire was anonymous and participants were assured of the confidentiality of their responses.

Statistical analysis: Data were reviewed on a daily basis for completeness and accuracy, then managed and analyzed using *SPSS*, version 22.0. Data management included coding, entry, analysis and presentation in tables. *Epi-Info*, version 7.0 was used to calculate sample size. Descriptive statistics [mean, standard deviation (SD) and proportion] were used to describe the study variables. Inferential statistics (Kruskal Wallis tests) were also used to assess the significance among study variables. This non-parametric test was applied due to non-normal distribution of data as was evident by significant p value ($p < 0.05$) for both Kolmogorov-Smirnov and Shapiro-Wilks test value. Small sample size was another criterion which supported the use of non-parametric tests. Linear regression was used to measure the strength of the association between knowledge status of students and the socio-demographic variables, with 95% confidence intervals. P -value < 0.05 was considered as a sign of statistical significance.

Table 1: Student's knowledge about corona virus

	Correct answer No. (%)	False answer No. (%)	Don't know No. (%)
General knowledge			
-Corona virus is the causative agent of MERS disease.	104(47.5)	28(12.8)	87(39.7)
-Corona infection is restricted to SA and other gulf countries.	137(62.6)	40(18.3)	42(19.2)
-Corona virus is an infectious agent.	190(86.8)	10(4.6)	19(8.7)
-Corona virus attacks the respiratory system and can cause respiratory failure.	151(68.9)	11(5.0)	57(26.0)
Modes of transmission			
-All body fluids transmit the virus equally	57(26)	45(20.5)	53(24.1)
-Virus can be transmitted through:	126(57.5)	38(17.3)	55(25.1)
• Handshaking	186(84.9)	9(4.1)	24(11.0)
• Droplets during coughing or sneezing	49(22.4)	72(32.9)	98(44.7)
• Insect bite	130(59.4)	29(13.2)	60(27.4)
• Camel or bat	16(7.3)	143(65.3)	60(27.4)
• Blood transfusion or contaminated needles			
Clinical picture			
- Symptomless carriers may be present	55(25.1)	93(42.3)	71(32.4)
- Flu like symptoms is the early manifestation of corona virus infection	177(80.8)	15(6.8)	27(12.3)
- The disease may cause acute respiratory illness or respiratory failure	167(75.9)	9(4.1)	43(19.6)
- Diagnosis of corona infection depends only on the symptoms of disease	71(32.4)	73(33.3)	75(34.2)
Prevention and control			
- At present, there is no treatment for corona infection	97(45.3)	39(18.2)	77(36.0)
- No vaccination against corona infection	80(37.4)	63(29.4)	70(32.7)
- Early detection prevents serious manifestation of disease	167(78.0)	12(5.6)	34(15.9)
- Frequent hand washing	197(92.5)	2(0.9)	13(6.1)
- Using handkerchief during coughing or sneezing	186(86.9)	9(4.2)	18(8.4)
- Using masks when dealing with patients	194(88.2)	4(1.9)	15(7.0)

Table 2: Student's total knowledge scores about corona virus according to their personal characters

	No.	Mean±SD	Mean rank	P value
Age (Year)				
- Less than 20	32	14.19 ± 5.39	73.08	0.000*
- 20-24.9	129	16.51 ± 4.22	100.60	
- 25-29.9	31	17.23 ± 4.89	117.06	
- 30 or more	13	20.46 ± 1.33	166.92	
Department				
- Preparatory year	99	15.34 ± 4.93	93.32	0.001*
- Emergency medicine	71	16.98 ± 4.40	117.14	

- Medical imaging	29	18.48 ± 3.78	143.38	
- Health administration	8	19.00 ± 3.29	143.50	
- Clinical laboratory	11	15.27 ± 4.65	91.77	
Father education				
- Illiterate	15	14.67 ± 4.79	79.8	0.484
- Read and write	16	17.00 ± 4.32	117.31	
- Preparatory	50	16.50 ± 5.40	111.8	
- Secondary	72	16.33 ± 4.34	103.22	
- University	44	16.75 ± 4.15	109.68	
- Master or PhD	16	16.50 ± 6.08	116.84	
Mother education				
- Illiterate	33	15.30 ± 5.53	98.08	0.808
- Read and write	45	16.00 ± 4.90	102.76	
- Preparatory	44	16.48 ± 4.75	109.02	
- Secondary	56	17.13 ± 3.99	115.10	
- University	28	17.07 ± 4.16	115.36	
- Master or PhD	10	15.80 ± 5.88	110.30	

Note: Knowledge was assessed by giving 1 to correct answer and 0 to false or don't know the answer. The scale measured knowledge of maximum 27 to minimum 0.

*Significant Kruskal Wallis test

Table 3: Distribution of students according to their source of information, their attitude about the accuracy of these sources and type of information they need.

	No.	%
Source of information		
- Newspaper	10	4.7
- TV	62	28.8
- Websites	87	40.5
- Posters	18	8.4
- Books	1	0.5
- Friends	26	12.1
- Others	11	5.1
Student's attitudes about accuracy of their sources		
- High accuracy	93	43.1
- Medium accuracy	107	49.5
- Low accuracy	16	7.4
Type of information needed by students		
- General information	63	29.2
- Mode of transmission	27	12.5
- Symptoms and signs	14	6.5
- Preventive measures	75	34.7
- Control measures	35	16.2

Table (3): Most of the students get their information about the corona virus from websites (40.5%) followed by TV and friends (28.8% and 12.1% respectively). Also, 43.1% of students believed that their source of information about corona virus is highly accurate, 49.5% believed that it was of medium accuracy while 7.4% believed that it was of low accuracy. As regards the type of information needed by the students, 34.7% reported that they need information about preventive measures, 29.2% needs general information about the virus while only 6.5% needs information about symptoms and signs of disease.

Table 4: Student's attitude and behavior about corona virus infection

	Agree No. (%)	Undecided No. (%)	Disagree No. (%)
-Corona is a fatal virus.	177(82.7)	22(10.3)	15(7.0)
-Corona patients can be identified from the external appearance.	47(22.0)	65(30.4)	102(47.7)
-Avoid handshaking with patients.	159(74.6)	19(8.9)	35(16.4)
-Don't worry when sitting near the diseased person.	59(26.8)	17(8.0)	136(64.2)
-Diseased person must be isolated.	167(75.9)	20(9.6)	21(10.1)
-Health education campaign decreases the virus transmission.	169(76.8)	24(11.3)	19(8.9)
-Number of corona cases still small	80(37.6)	50(23.5)	83(39.0)
-Corona virus is dangerous to the community.	172(80.4)	26(12.1)	16(7.5)

Table (4) shows that most of the students agreed that corona is a fatal virus (82.7%) and it's dangerous to the community (80.4%), diseased people must be isolated (75.9%), health education campaigns decrease the virus transmission (76.8) and they avoid handshaking with the diseased people (74.6%) whereas only 26.8 % report that they don't worry when sitting near the diseased person.

Table 5: Student's attitude about efforts for corona virus infection prevention and control

	Agree No. (%)	Undecided No. (%)	Disagree No. (%)
-The responsible authority take the necessary measures for disease control	118(55.1)	33(15.4)	63(29.4)
-There is a sufficient health education campaign for disease prevention	101(45.9)	43(19.5)	57(27.0)
-Educational institutions play an important role in disease prevention	111(50.5)	43(20.4)	57(27)
-Hospitals and health centers provide the clients with sufficient information about disease prevention and control	118(55.7)	38(17.9)	56(26.4)

Table (5) shows that most of the students agreed that the responsible authority takes the necessary measures for disease control (55.1%), hospitals and health centers provide clients with sufficient information about disease prevention and control (55.7%) and educational institutions play an important role in disease prevention (50.5%) whereas only 45.9% agreed that there is a sufficient health education campaign for disease prevention.

Discussion

To the best of our knowledge, there are no previous reports of similar studies that examined the student's knowledge and attitude towards MERS. However, there is a study that examined knowledge and attitude of healthcare workers about the Middle East respiratory syndrome in multi-specialty hospitals of Qassim, Saudi Arabia [9].

Regarding student's knowledge about corona virus, most students give correct answers to questions related to disease prevention and control, general knowledge about corona virus and disease symptoms respectively. On the other side, the least correct answers were to questions related to modes of transmissions, especially about blood transfusion or contaminated needle transmission (7.3%), insect bite transmission (22.4%) and body fluid transmission (26%). This may be a

reflection of health education campaigns against corona virus infection, therefore, more emphasis on the modes of transmission should be in the future educational campaign.

Also, these findings generally agree with the finding of the study conducted on the health care workers [9], where most correct responses were on questions about disease symptoms followed by questions on the prevention.

On comparing the knowledge status of students with their knowledge requirements or demands, the study discovered that the students' demands do not respond to their needs (as identified by the percent of students with the correct answer for each knowledge item). Most of the students demanded information about the prevention and control measures (50.9%) where most of them give

correct answers to questions related to this item. On the other side, only 12.5% demanded information about modes of transmission, which have the least correct answers. This was considered a bad indicator as it reflects student's unawareness of the defects in their knowledge status. This will consequently affect the degree of response for any health education campaign targeting these students.

With regard to the student's source of information about corona virus, most students recorded that they depend on the internet (40.5%) followed by TV (28.8%) as a source of information about corona virus. This is a logical finding due to internet widespread in the last years, where most of the college students become internet users and dependent on it as the main source of information in all fields including health. Also, this finding attracts the attention to the importance of internet utilization, especially social media in any health education campaign targeting Saudi students.

There is a significant difference in the student's knowledge score across their age groups with the lowest total knowledge score was observed among students less than 20 years old (14.19) and this score progressively increased across age groups to reach maximum (20.46) among students aged 30 or more. This point must be taken into consideration during planning for any intervention program against corona where people with low knowledge are more vulnerable to infection. Greater efforts must be expended for adolescents and early twenty's students as they have insufficient knowledge in comparison with the older age groups. However, this finding disagrees with what observed by *Khan* [9] where there is no significant difference in health worker knowledge across their age categories.

Also, it was observed that there is a significant difference between student's knowledge according to their studying department in the college. However, the confounding effect of student's age is responsible for this observed difference where preparatory year students were in the 1st and 2nd levels of study, clinical laboratory students were in the 4th level, emergency medical students were mainly in the 6th level whereas medical imaging and health administration students were in 7th and 8th levels and some of them were upgrading students. Also, significant difference was observed between students in the different college departments as regards their age categories ($p=0.000$). This age difference between students in the college

departments is responsible for the observed significant difference in knowledge status of students. This view was confirmed by a linear regression analysis with the only significant association was observed between student's knowledge score and their age category.

Another surprising point in the study is that, parental education has no effect on the student's knowledge where there is a lack of significant difference between students knowledge score regarding the education of father or mother. This may be attributed to the small sample size of the study, which did not enable the statistical tests to give significant results. This was supported by the fact that, students of illiterate fathers or illiterate mothers have the lowest knowledge score.

In terms of attitude of students towards corona virus, the study showed that most of the students considered it a fatal disease, dangerous to the community and diseased person must be isolated and health education campaign decreases the virus transmission whereas only 22% agreed that corona patients can be identified from the external appearance. This finding more or less agreed with the finding of *Khan* [9] especially in the item related to patient isolation where 82.4% of health workers agreed that MERS patients should be isolated. On the other side, most of students agreed that they will avoid handshaking and sitting beside the diseased person. This attitude and absence of any misconception of students toward corona virus are an encouraging to increase efforts for further achievements towards eradication of corona from the population.

Also, most of them express a favorable attitude when they were asked about the efforts of different authorities for disease prevention and control, where 55.1% agreed that responsible authorities take the necessary measures for disease control, 50.5% agreed that educational institutions play important role in disease prevention and 55.7% agreed that hospitals and health centers provide clients with sufficient information about disease prevention and control.

Limitation: Despite the valuable contribution of this study in exploring the knowledge and attitude of university students towards corona virus infection, there is a problem considering the generalization of the findings of the study to the total population due to insufficient study sample which is restricted to students of Al Ghad College in Riyadh City. Also, because the corona infection is a newly emerging disease, there is a lack of references on similar studies conducted on this

topic, especially those targeting university students. The only available study is the study which targets health care workers in multi-specialty hospitals of Qassim, Saudi Arabia [9], so there is no place for comparing the results of our study with other studies.

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