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Knowledge, Attitude and Practice towards COVID-19 Pandemic among Secondary Schools Teachers in Al-Medina City in 2020

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Abstract

Introduction: In order to benefit from all preventive recommendations of Covid-19 pandemic, a holistic approach must be adopted to ensure proper public health education. To investigate the knowledge, practice and attitudes of secondary school teachers toward covid 19 infection.

Methods: This is a descriptive cross-sectional study conducted among male and female governmental secondary schools teachers at Al-Madinah city, Saudi Arabia. Self-administered online validated Arabic questionnaire was distributed via google forms. It is composed of three parts: sociodemographic data, participants` knowledge about the disease caused by covid19 and the source of their information about the disease.

Results: The study included a total of 479 secondary school teachers. Females represented 50.9% of them. Their age ranged between 25 and 60 years with a standard deviation (SD) of 35.6±6.7 years. Overall, more than half of them (57%) had good level of knowledge/attitude about covid-19 infection. The main source of information about Covid-19 among the teachers was Twitter (45.1%), followed by internet websites (27.1%) and TV (24%). Almost two-thirds of the teachers have performed the protective measures against Covid-19 pandemic (ranged between 62.6% for avoid contact with infected person to 66.2% for regular hand washing with soap & water and other sanitizers).

Conclusions: Knowledge of secondary school teachers about Covid-19 was average at the beginning of the pandemic, with no difference between them regarding sociodemographic characteristics and source of information. Their practice of protective measures was better.

Keywords: COVID-19, Knowledge, Practice, Teachers, Saudi

Introduction

In the late 2019 an outbreak of 40 patients with respiratory illness including pneumonia confirmed in Wuhan, China to have a previously unknown beta coronavirus and, consequently, reported by the Chinese authorities to the world health organization (WHO). In 7th of January 2020 the virus identified and referred as 2019 novel coronavirus (2019-nCoV) by the WHO [1]. later on, on the 11th of February WHO announced an official name for the virus as COVID-19 [2].

Coronaviruses are large group of zoonotic diseases found to cause a respiratory illness in humans. severity ranges from mild common cold to sever respiratory illness [2]. Investigators know that many coronaviruses circulate in animals not yet spreads to humans [7]. Strains only found to spread to humans 2 of them cause serious illness. Previously isolated strains that found to cause a severe respiratory illness was Middle East Respiratory Syndrome (MERS-CoV) and severe acute respiratory syndrome (SARS-CoV) MERS-cov which transmitted from camels to humans and SARS-CoV was transmitted from civet cats to humans. For the new n-CoV many affected cases found that they were geographically related to the local animal market but no evidence of animal transmission yet [3].

Last report released by WHO at 29th of December 2020 Globally in the past week, over 4 million new COVID-19 cases and 72 000 new deaths were reported. This brings the cumulative numbers to over 79 million reported cases and over 1.7 million deaths globally since the start of the pandemic [4]. Disease Manifestation of the virus varies from cough, sneezing, fever, sob to pneumonia which cause acute respiratory distress, renal failure and may ended by death. Center for Disease Control and Prevention (CDC) believed that symptoms can appear as few as 2 days or long 14 days based on incubation period of the previous MERS infection [5].

As most of the respiratory viruses spread from person to person the covid19 do so, but until now no clear data about how fast and easy this virus can spread between people [6]. WHO recommend the standard precautions to prevent spread of the disease including hand hygiene, avoid close contact with ill persons, avoid unprotected contact with wild or farm animals, practice respiratory etiquette (cover mouth when sneeze or cough and dispose tissue appropriately with respiratory secretions) [7]?

Dec. 11, 2020, the Pfizer-BioNTech COVID-19 Vaccine has been available under EUA in individuals 16 years of age and older and no antiviral treatment is specifically recommended only supportive care for the infected persons [8]. In order to benefit from all preventive recommendations, a holistic approach must be adopted to ensure proper public health education. This study seeks to investigate the knowledge, practice and attitude of teachers of secondary schools toward covid19 infection. The importance of this study is to target the teachers who represent a major role in educating, influencing, and promoting preventive measure among young students. Additionally, the study aims to investigate the sources of information most often used by teachers and how knowledge about the disease has affected their lifestyles.

In 31st of December 2019, recent pathogenic HCoV, novel coronavirus (2019-nCoV), appeared in Wuhan, China, and caused serious illness and death [9]. The viral genome has been sequenced, and these results in conjunction with other reports show that it is 75% to 80% identical to the SARS-CoV and even more closely related to several coronaviruses [10]. Relatively, bats are the reservoir of so many coronaviruses, including SARS-CoV-like and MERS-CoV-like viruses [11]. SARS-CoV was transmitted to humans from exotic animals in wet markets, whereas MERS-CoV is transmitted from camels to humans [12].

In Riyadh, in 2015, level of knowledge among secondary school and university students toward MERS-CoV infection was similar as well as between male and female students. The most frequently reported source of transmission is entering crowded spaces and being exposed to coughing and sneezing. Additionally, hand washing was the most commonly reported method of protection against the infection [13]. Another study showed that the majority of the participants showed high levels of concern and had utilized precautionary measures. After adjusting for

other variables, gender was the only significant predictor of the level of concern (P < .001), while knowledge was the significant predictor of both the level of concern and precaution [14].

In Riyadh 2017 Al-Mohaissen conducted across sectional study between 10 December 2015 and 10 February 2016 at the all-female Princess Nourah bint Abdulrahman University. Among students and workers in Princess Nourah bint Abdulrahman University, only 67.1% knew the recommended preventive hygiene practices. awareness of the recommended precautions was poor (55.5%) [15].

In South Korea 2015 Yang, S. 53.3% of students 53.5% had essential knowledge about MERS and females showed higher risk perception than men, and trust in the media was positively associated with risk perception [17]. Of the 381respondents aged between 17 and 85 years, 55% had never heard of MERS, while only one in three knew that it is a respiratory disease. Approximately half were insufficiently informed about protective measures. Prospective pilgrims do not seem prepared to take such precautions [18].

Teachers are the right people to convey an important massage to students. There are a lot of information at this moment about this disease, some of which are not correct. By doing such research in schools the author hopes to send a correct message to teachers. The aim of this study is to investigate the knowledge, practice and attitude of secondary school teachers towards covid19 infection.

Methods

This is descriptive Cross-sectional study that was conducted among male and female governmental secondary schools' teachers at Al-Madinah cit. non-Arabic speakers and non-Saudi teachers were excluded. Using the sample size calculation for the program Epi-Info, the following results obtained and taking in to consideration the total number of male teachers in Almadinah as 2000, the expected proportion of knowledge is set by the program at 50%. The total of male and female was 479 teachers divided on males and females' schools. Type of sampling was a multi stage sampling technique stratifying Almadinah area into 4 geographical directions; south, north, west and east. Then four schools were selected by simple random sampling. In each of the chosen schools' teachers self-selected themselves when they agree to answer the questioner.

Self-administered online Arabic Questionnaire validated and used at previous study distributed via Google forms 15. The corresponding author was contacted via email and permission to use the same questions with modification in terms of covid19. The online questionnaire composed of two main parts: First part consists of sociodemographic data, second part includes questions the participants` knowledge and attitude about the disease caused by covid19, its nature, mode of transmission, symptoms and signs, incubation period, period of communicability, and preventive measures. A scoring system was created as correct answers were assigned a score of "1" whereas incorrect answers were assigned a score of "0". Total score and its percentage were computed for every teacher. Then they were classified into three categorized, based on their knowledge; poor (<50%), average (50-75%) and good (>75%). Other parts of the questionnaire focused on practices regarding prevention of infection and the source of information about COVID-19. The questionnaire was tested in a pilot study on 10% of total sample size. The questionnaire was clear and understandable. Participants were excluded from the study sample.

Statistical program for social sciences Version 26 was used for data entry and statistical analysis. Frequency and percentage were applied to describe categorical variables whereas range, mean and standard deviation (SD) were applied to describe continuous variables. Chi-square test was used to test for the association between categorical variables whereas one-way analysis of variance test was applied to compare the arithmetic mean of a continuous variable between more than two different groups. P value < 0.05 was considered for significance.

The proposal was submitted for ethical approval by research ethical committee in Al-Madinah, regional research committee at the joint program of family medicine in Al-Madinah and ministry of education. Approval was taken from joint program of family medicine in Almadinah and ministry of education at Almadinah. Participant's consent was taken and confidentiality was assured during all stages of the study.

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Results

The study included a total of 479 secondary school teachers. Their sociodemographic characteristics are presented in Table 1. Females represented 50.9% of them. Their age ranged between 25 and 60 years with an Mean±standard deviation (SD) of 35.6±6.7 years. Majority of them (93.7%) had Bachelor degree as a highest qualification. Years of teaching ranged between one and 10 years among 66% of the teachers whereas it exceeded 10 years among 24.6% of them.

Table 1: Sociodemographic characteristics of Saudi secondary school`s teachers

Characteristics	***Frequency***	***Percentage***
Gender		
Male	*235*	*49.1*
Female	*244*	*50.9*
Age (years)		
Range	*25-60*	
Mean±SD	*35.6±6.7*	
Highest qualification		
Diploma	*8*	*1.7*
Bachelor	*449*	*93.7*
Master	*22*	*4.6*
Years of teaching experience		
≤1	*45*	*9.4*
>1-5	*165*	*34.5*
>5-10	*151*	*31.5*
>10	*118*	*24.6*

The majority of the teachers could recognize that the first covid confirmed case appeared in China, 2019 (99.4%) and many countries in the world have been affected by the pandemic (99.2%). All of them knew that covid-19 is contagious, 97.7% knew that it is a viral respiratory disease caused by corona virus and 93.7% knew that fever, cough, shortness of breath and sometimes diarrhea are the commonest reported symptoms of the disease. The source of getting infection from close contact with a patient without taking needed precautions was recognized by majority of the teachers (95.4%). The original source of the Covid-19 (Bats) was known by majority of them (98.7%). All of them knew that there is a vaccine and no specific treatment for the diseases and 98.1% knew that WHO recommends investigating all travelers and isolation of confirmed/suspected cases of the disease. On the other hand, minority of them could recognize the incubation period of the disease (6.7%) and the fact that children are less affected by the disease than adults. Overall, more than half of them (57%) had good level of knowledge/attitude about covid-19 infection (table 2).

The main source of information about Covid-19 among the teachers was Twitter (45.1%), followed by internet websites (27.1%) and TV (24%) as shown in table 3. There was no statistically significant difference between male and female teachers regarding their level of knowledge about Covid-19. Similar results were obtained for age, qualification level, and years of experience. The highest level of good knowledge about Covid-19 was observed among teachers whose main source of information about the disease was internet websites (65.4%) whereas the lowest rate was reported among those whose main source of information was other than internet websites, television or Twitter such as family, friends (38.9%). However, this was non-significant with p=0.070 as illustrated from tables 3 and 4.

In Table 5, it is shown that almost two-thirds of the teachers have performed the protective measures against Covid-19 pandemic (ranged between 62.6% for avoid contact with infected person to 66.2% for regular hand washing with soap & water and other sanitizers).

Discussion

The Saudi government adopted numerous strategies to increase public awareness of the pandemic in the hope of improving their preparedness to tackle it. Assessing the knowledge, attitudes and practices of the general public as well as specific groups as in the present study will help identify weak aspects that might be improved. However, assessing level of knowledge about an infectious disease can be affected by many

factors such as seriousness of the disease, the rate of spread of cases and method for distribution of knowledge about the disease. In the case of Covid-19, the pandemic nature and fast spread of the disease all over the world, including Saudi Arabia and the number of fatalities associated with it leads to an increased interest of the public in recognizing how to avoid infection and how to maintain proper preventive measures both on the community and on the personal level. In this study, we investigated the knowledge of secondary school students and teachers toward covid 19 infection.

Table 2: Response of the secondary school teachers in Al-Madinah to Covid-19 knowledge/attitude questions

Knowledge questions	***Correct answers***		
	Response	**Frequency**	**%**
What is Covid-19?	Viral respiratory disease caused by corona virus	468	97.7
When and where First covid confirmed case appeared?	2019-China	476	99.4
What are the countries with covid confirmed cases?	Many countries in the world	475	99.2
What is the dangerousness of symptoms on infected covid-19 cases?	Some patients are asymptomatic and others have variable degrees of symptoms` severity	302	63.0
What are the common symptoms of Covid-19?	Fever, cough, shortness of breath and sometimes diarrhoea	449	93.7
What is the covid-19 incubation period?	Average 5 days (2-14 days)	32	6.7
Is covid-19 contagious?	Yes	479	100
If contagious, what the source of infection?	From close contact with a patient without taking needed precautions	457	95.4
What are the commonest infected communities?	Family, work, healthcare, and social events	157	32.8
How we get infected with Covid-19	Through inhaling coughing or sneezing products of an infected person/toughing contaminated surfaces and them touching mouth, nose or eye	426	88.9
What is the original source of the Covid-19?	Bats	473	98.7
What is the reason for Covid-19 outbreak?	Overcrowding, delayed diagnosis and poor infection control practice	331	69.1
WHO recommends travel and trading restrictions as regards Covid-19	WHO recommends investigating all travelers and isolation of confirmed/suspected cases	470	98.1
Is there available vaccine and treatment for Covid-19	There is a vaccine and no specific treatment	479	100
Which group of people more susceptible to Covid-19 infection	Diabetic patients, those with renal failure, chronic lung diseases and immunosuppressive disorders	332	69.3
What is the risk of children affection by Covid-19 pandemic?	Less affected than adults	25	5.2

Teachers of the secondary phase of education were selected as a target population in this study as they can convey an important massage to their adolescent students, and consequently to the whole community. In the present study, more than half of the secondary school teachers (57%) expressed good level of knowledge about covid-19 infection, with no difference between them regarding sociodemographic characteristics as well as the main source of information. This is could be attributed to the fact that the teachers are considered a homogenous group of people with no such big difference between them. Regarding practice of covid-19 protective measures, the score ranged between 62.6% and 66.2%. Up to date, the evidence of effective treatment against covid-19 has not been achieved, thus the main focus lies on the prevention of its spread through specific measures such as keeping social spacing, regular hand disinfection and wearing face mask [18].

Previous studies have been conducted in Saudi Arabia and worldwide to investigate the knowledge of general public and particularly teachers and students about previous and current Coronavirus outbreaks. In Riyadh (2015), Al-Hazmi et al. the level of knowledge among secondary school and university students about MERS-CoV infection was not affected by the participants` gender and the most frequently reported source of transmission was entering crowded spaces and being exposed to coughing and sneezing. Additionally, hand washing was the most commonly reported method of protection against the infection [13]. In the current pandemic, the main source of infection is close contact with a patient without taking needed precautions through inhaling coughing or sneezing products/toughing contaminated surfaces and them touching mouth, nose or eye [19]. In another Saudi study carried out also in Riyadh city (2015) among adult subjects recruited from various shopping malls, the majority of them showed high levels of concern and had utilized precautionary measures and gender was the only significant predictor of the level of concern while knowledge was the significant predictor of both the level of concern and precaution [14]. Also, in Riyadh (2017), most of the students, faculty members and non-academic staff (78.9%) could recognize the typical symptoms of MERS-CoV but only 67.1% knew the recommended preventive hygiene practices [15].

Table 3: Association between teachers` characteristics and knowledge/attitude level about Covid-19 pandemic

Characteristics	***Knowledge/attitude level***			***p-value***
	Poor N=39 N (%)	Average N=167 N (%)	Good N=273 N (%)	
Gender				
Male (n=235)	15 (6.4)	82 (34.9)	138 (58.7)	
Female (n=244)	24 (9.8)	85 (34.8)	135 (55.3)	0.369
Age				
Mean	36	35.4	35.6	
Standard deviation	7.4	6.4	6.8	0.848
Qualifications				
Diploma (n=80	1 (12.5)	5 (62.5)	2 (25.0)	
Bachelor (n=449)	38 (8.5)	154 (34.3)	257 (57.2)	
Master (n=22)	0 (0.0)	8 (36.4)	14 (63.6)	0.244
Years of work experience				
≤1 (n=45)	3 (6.7)	17 (37.8)	25 (55.6)	
>1-5 (n=165)	16 (9.7)	56 (33.9)	93 (56.4)	
>5-10 (n=151)	9 (6.0)	54 (35.8)	88 (58.3)	0.921
>10 (n=118)	11 (9.3)	40 (33.9)	67 (56.8)	

*Chi-square test

Recently, high level of knowledge among general public have been observed in Saudi studies [20,21]. This is could be attributed mainly to the role played by the Ministry of Health (MOH) in the Kingdom of Saudi Arabia starting from the beginning of the disaster in increasing the public awareness about the different aspects of the pandemic including symptoms, mode of transmission, and preventive tools through public campaigns for all members of society as well as disseminating information through personal mobile messages, advertisements on social media, mass media, teleconsultation through the Mawid App, and electronic screens in public areas [22].

Regarding global level, in Nepal (2021), 57% of private schools` teachers had good knowledge about COVID-19 with gender and COVID-19 training were significantly associated with good knowledge [23]. Also in Nepal, the average knowledge about Covid-19 score was 43% while that of practice was 82.5% [24]. Higher levels of knowledge and practice about COVID-19 have been observed among the general public in other Asian studies [25-27]. The relatively lower level of knowledge observed in this study could

be explained by the fact that this study was carried out in the early stage of the pandemic.

In accordance with others in Saudi Arabia [20], methods adopted to prevent the transmission of COVID-19 transmission such as hand washing, keeping social distancing, and using face masks were applied by a considerable proportion of the teachers in this study; although the study being conducted in the early stage of the disease, which again reflect the effort done by the Ministry of Health.

Table 4: Association between teachers` main source of information and knowledge/attitude level about Covid-19 pandemic

Main source of information	**Knowledge/attitude level**			p-value*
	Poor	**Average**	**Good**	
***Television* (n=115)**	8 (7.0)	39 (33.9)	68 (59.1)	0.070
***Internet websites* (n=130)**	9 (6.9)	36 (27.7)	85 (65.4)	
***Twitter* (n=216)**	18 (8.3)	85 (39.4)	113 (52.3)	
Others (n=18)	4 (22.2)	7 (38.9)	7 (38.9)	

This study was strengthened by the multi-stage sampling methods, which may reduce the selection bias and by the relatively sufficient sample size. However, it is limited by the self-reporting nature of the study tool, which might possess a social desirability bias, particularly regarding practice issues. The cross-sectional design is also considered a limitation in proving the causality. Despite those limitations, the study might have importance, particularly at early stages of the pandemic in informing planners and decision makers in formulating and implementing protective response plans to the pandemic.

Conclusions

Knowledge of secondary school teachers in Almadinah city, Saudi Arabia about Covid-19 at the beginning of the pandemic was average, with no difference between them regarding sociodemographic characteristics and source of information. Their main source of information was Twitter, followed by internet websites and Television. Their practice of protective measures against transmission of infection was better. Improving the knowledge of school teachers and the general public about different aspects of the pandemic, particularly the protective measures.

Conflict of interests

The authors declared no conflict of interests.

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Table 5: Teachers` practice related to covid-19 pandemic protective measures

Practices	Proper practice	Frequency	%
Precautions taken to avoid covid-19 infection include:			
-Avoid direct contact with infected person.	Yes	300	62.6
-Regular hand washing with soap & water and other sanitizers.	Yes	317	66.2
- Using tissue when coughing and sneezing, then throw it in a trash.	Yes	307	64.1
- Avoiding touching the mouth, nose and eyes by hand before washing them.	Yes	314	65.6
-Wearing a protective mask when leaving the house to avoid getting infected.	Yes	316	66.0
-Taking antibiotics on a daily basis to get the best protection.	No	305	63.7
-Avoid hand checking and keep social distance.	Yes	309	64.5