



Knowledge and Source of Information of COVID-19 among Students of Health Informatics, Qassim University, Saudi Arabia

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Authors' contributions

This work was carried out in collaboration among all authors. Authors SA and KSN designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors AHA and QMSJ managed the analyses of the study. Author QMSJ managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Background: The Kingdom of Saudi Arabia has undertaken strong measures to prevent the spread of COVID-19. Several steps were taken to communicate with the public on how the virus spreads and various precautionary measures to be taken to prevent the disease. The knowledge and perception regarding COVID-19 influence the design and implementation of preventive measures and campaigns to control the spread of the virus.

Objectives: This study aims to assess the knowledge and perceptions of students at a health informatics program about COVID-19 pandemic.

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Methods: This descriptive study utilized a web-based survey about COVID-19 pandemic was distributed to 320 students (222 females and 98 males) at the Bachelor in Health Informatics Program, Qassim University, Saudi Arabia the first week of April 2020. The survey instrument was developed and distributed to all students in the program using social media platforms. The survey required 10 minutes to complete.

Results: The study revealed that only 20% of respondents had adequate knowledge about the signs and symptoms of COVID-19, with 22.5% had knowledge about the right modes of transmission of the virus. However, 55.6% of them had adequate knowledge of ways of protection against COVID-19. The study findings reveal that a significant knowledge gap exists among health informatics students about COVID-19 regardless of the amount of available information about the pandemic. Social media was the major source of information to a majority (79%) of respondents.

Conclusion: As COVID-19 continues to devastate the healthcare systems and creates a huge threat to human wellbeing, it is paramount to improve the knowledge and perceptions of university students in Saudi Arabia. An appropriate health promotion platform is recommended to reach all students in the country.

Keywords: Coronavirus; COVID-19; knowledge; source of information; university students.

1. INTRODUCTION

Coronavirus disease (COVID-19) was first reported on 31st December 2019 in Wuhan, China [1]. The symptoms of the disease range from mild fever and respiratory symptoms like cough and shortness of breath to severe pneumonia, acute respiratory syndrome, and kidney failures, with about 4% mortality rate [1]. The virus is characterized by quick transmission and can spread by closer contact with an infected person [2,3,4,5]. Although details are still evolving, it has spread widely and rapidly, from China to the entire world, threatening people's life [6]. Preliminary analysis revealed that the virus has high fatality rates particularly for older people or those with acute health conditions. As of today, about 200 countries in the world have reported cases of COVID-19 in varying numbers; however, the virus has severely affected countries like the United States, Italy, Spain, France, Iran, and United Kingdom. It is also reported that many health systems have overburdened due to COVID-19 [7,8]. By the end of August 2020, the world recorded about 26.4 million COVID-19 cases and 0.87 million deaths. As of 3 September 2020, Saudi Arabia has recorded 318319 confirmed COVID-19 cases, with 3982 deaths [1].

After the declaration COVID19 as a Pandemic by the World Health Organization (WHO) on 11 March 2020, Saudi Arabia has adopted plans to respond to the pandemic. The first case of COVID-19 was confirmed on 2nd March 2020, since then the government has taken all possible measures in accordance with WHO guidelines in dealing with the pandemic (ref the ministry of

health website). To mitigate the effect of COVID-19 in the country, the Saudi government suspended all international flights, shot down all businesses, educational institutions, and all religious places, except essential services such as pharmaceuticals and grocery shops. A national-wide lockdown was imposed on 24 March 2020 to restrict the movement of people during the day times [9,10,11].

As there is no medicine available for treatment of the disease nor a vaccine to prevent the spread of virus, the only feasible method to control this pandemic is to prevent people from acquiring the disease and reducing its spread [12,13]. Quick sharing of information about the disease is an effective method to improve community responsiveness related to the prevention and control of the disease. Limited studies were available on students' knowledge and perceptions about COVID-19, and how the virus spreads, preventive measures for this disease, and the role of various media for dissemination of information related to the disease. University students constitute a unique population for assessing this information due primarily to their reliance on using various social media platforms. It is critical for the students to have accurate and up-to-date knowledge of the signs and symptoms of COVID-19 so that they can take preventive measures to protect their health. In Saudi Arabia, studies on knowledge of the signs and symptoms of COVID-19 among the population are available, but such a study among university students is lacking. The purpose of this study was to assess the knowledge and perceptions about COVID-19 among university students and to identify the

main sources they rely on to acquire information about the pandemic.

2. METHODS

This was a descriptive study conducted through Google form among Bachelor in Health informatics students, Qassim University, Saudi Arabia about COVID-19 pandemic during the first week of April 2020. A survey questionnaire was developed and distributed to all students in the program using Google form. The questionnaire was developed based on the information available on the World Health Organization (WHO) and the Centre for Disease Control (CDC) websites. The questionnaire consisted of 30 questions in four sections such as common signs and symptoms, mode of transmission, methods of protection and source of information. All questions requiring 'yes' or 'no' response from the respondent. The survey questionnaire was sent to all 340 students who were in various levels of study in the Bachelor program, out of which 320 students submitted the filled questionnaire (94% response rate), and the questionnaire submitted by the remaining 20 students were incomplete in several respects, so not considered for analysis. Respondents in the study included 222 female and 98 male students. The survey required about 15 minutes to complete. The questionnaire consisted of a brief introduction including the objectives of the study and emphasizing that participation in the study is voluntary, and responses would be treated confidentially. It consists of questions related to student's knowledge about COVID-19, modes of transmission, signs and symptoms, complications, and the sources of receiving information about the disease. Descriptive analysis was performed to calculate and report the frequencies and proportions. The reliability test of variables was conducted using Cronbach's Alpha Based on standard items.

3. RESULTS

In this study, 320 students completed the questionnaire. The age of respondents ranged from 18 to 30 years. The majority of them (78%) are between 18 to 24 years, with a mean age of 22.3 years and standard deviation of 3.6. The students' knowledge about signs and symptoms of COVID-19 was assessed by asking them to choose from the list of seven items, including high fever, body aches, running nose, cough sore throat, shortness of breath and presence of acute and severe respiratory symptoms. The results, as shown in Table.1 indicate that the majority of respondents were aware of high fever and cough as symptoms of COVID-19. Further, the respondents were grouped into three categories based on the responses received from them. It was assumed that that student who responded rightly with all 7 items was considered as having complete knowledge, 3-6 as having partial knowledge and less than or equal to 2 is having low knowledge. The analysis shows that 21.6% of respondents had limited knowledge about signs and symptoms of COVID-19, 58.4% of them had partial knowledge and 20% of them had adequate knowledge. Cronbach's alpha coefficient for seven items is 0.759, indicating that the items have relatively high internal consistency.

In order to elicit the awareness of respondents about the spread of COVID-19, six items were included in the questionnaire. The findings in Table 2 reveal that about 80% of respondents correctly mentioned that close contact with infected persons and direct transmission through droplets expelled during cough and sneezes. Further, the respondents were grouped into three categories based on the responses received from them. It was assumed that students who responded rightly with all 6 items were considered as having complete knowledge,

Table 1. Student's knowledge of signs and Symptoms of COVID-19 (N=320)

Signs and symptoms	Yes	No
High Fever	275 (86.0%)	45 (14.0%)
Cough	269 (84.0%)	51 (16.0%)
Shortness of breath	251(78.4%)	69 (21.6%)
Acute and severe respiratory symptoms	245(76.6%)	75 (23.4%)
Sore Throat	203 (63.4%)	117 (36.6%)
Body aches	163 (51.0%)	157 (49.0%)
Running nose	120 (37.5%)	200 (62.5%)

Table 2. Students' awareness of modes of transmission of COVID-19 (N=320)

Mode of transmission	Yes	No
Close contact with the person affected by the virus	259 (81.0%)	61 (19.0%)
Direct transmission through droplets expelled during cough and sneezes	263 (82.2%)	57 (17.8%)
Touching surfaces and devices contaminated with the virus and then touching the mouth, nose, or eyes	249 (77.8%)	71 (22.2%)
Live in the area where people affected with virus	194 (60.6%)	126 (39.4%)
Recently been in the areas where people affected with virus	182 (56.9%)	138 (43.1%)
Contact with infected animals or animal products	136 (42.5)	184 (57.5)

Table 3. Student's awareness of ways of protection against COVID-19 (N=320)

Ways of protection	Yes	No
Wash our hands well and continually with water and soap or with other disinfectants, especially after coughing, sneezing, and using toilets.	282 (88.1%)	38 (11.9%)
Wash your hands before and after handling or preparing foods.	274 (86.0%)	46 (14.0%)
Use a tissue/other material when coughing or sneezing to cover your mouth and nose	272 (85.0%)	48 (15.0%)
Try to avoid touching eyes, nose, and mouth with your hands	272 (85.0%)	48 (15.0%)
Maintain healthy habits including a balanced diet, physical activity, and get plenty of sleep.	214 (66.9%)	106 (33.1%)
Avoid contact with any infected people or people likely to have more risks of infection	269 (84.0%)	51 (16.0%)

Table 4. Students' perception of COVID-19 (N=320)

Perceptions	Yes	No
Older adults and people of any age who have serious medical conditions may be at higher risk for serious complications from COVID-19.	264 (82.5%)	56 (17.5%)
The maximum period for catching the virus COVID-19 and beginning to have symptoms is 14 days	255 (79.7%)	65 (20.3%)
There is no vaccine currently available to cure this virus	252 (78.8%)	68 (21.2%)
This disease is known to occur in all age groups	244 (76.3%)	76 (23.7%)
Patients are given supportive medication to deal with the complications and alleviate symptoms	243 (75.9%)	77 (24.1%)
COVID-19 virus may persist on surfaces for several days depend on surface temperatures	207 (64.7%)	113 (35.3%)
Someone who has completed quarantine or has been released from isolation does not pose a risk of infection to other people	184 (57.5%)	136 (42.5%)
Wearing masks is not necessary unless we are visiting sick patients.	175 (54.7%)	145 (45.3%)
Antibiotics should not be used as a means of prevention or treatment of COVID-19.	184 (57.5%)	136 (42.5%)
It is not safe to receive a package from any area where COVID-19 has been reported	147 (45.9%)	173 (54.1%)

3-5 as having partial knowledge, and less than or equal to 2 as having low knowledge. The analysis shows that 20% of respondents had limited knowledge about the spread of COVID-19, 57.5% of them had partial knowledge and 22.5% of them had adequate knowledge. Cronbach's alpha coefficient for seven items is

0.73, indicating that the items have relatively high internal consistency.

Student's awareness about ways of protection from COVID-19 was measured through six items as shown in Table 3. The finding reveals that maintaining healthy habits including a balanced

diet, physical activity, and get plenty of sleep as a way of protection against COVID-19 was mentioned by 67% of respondents, whereas all other ways of protection were known by more than 80% of respondents. Further, the respondents were grouped into three categories based on the responses received from them. It was assumed that students who responded rightly with all 6 items were considered as having complete knowledge, 3-5 as having partial knowledge, and less than or equal to 2 as having low knowledge. The analysis shows that 11.6% of respondents had limited knowledge about the spread of COVID-19, 32.8% of them had partial knowledge and 55.6% of them had adequate knowledge on ways of protection against COVID-19. Cronbach's alpha coefficient for seven items is 0.78, suggesting that the items have relatively high internal consistency.

Student's perception of COVID-19 was measured through ten items. The findings in table 4 reveal that percentage of students with correct responses about COVID-19 is not impressive.

Further, the respondents were grouped into three categories based on the responses received from them. It was assumed that students who responded rightly with all 10 items were

considered as having complete knowledge, 5-9 as having partial knowledge, and less than or equal to 4 as having low knowledge. Findings reveal that 17.2% of respondents had limited knowledge about the spread of COVID-19, 69.1% of them had partial knowledge and 13.8% of them had adequate knowledge. Cronbach's alpha coefficient for seven items is 0.78, indicating that the items have relatively high internal consistency.

When respondents were asked about the source for reliable information about COVID-19, it was reported that social media was the prime source of information to almost 79% of them. These respondents used social media like Facebook, Twitter, WhatsApp, Instagram, YouTube, etc., to receive information about COVID-19. This is followed by other internet sources mainly websites of the Saudi MOH and the World Health Organization were also used by almost 52% of respondents. About 38% of respondents discussed COVID-19 related issues with their family members and friends, and 33% of them received information about COVID-19 through electronic media like television and radio. The study showed that only a small proportion of respondents (12.8%) received COVID-19 related information through newspapers and magazines (Fig. 1).

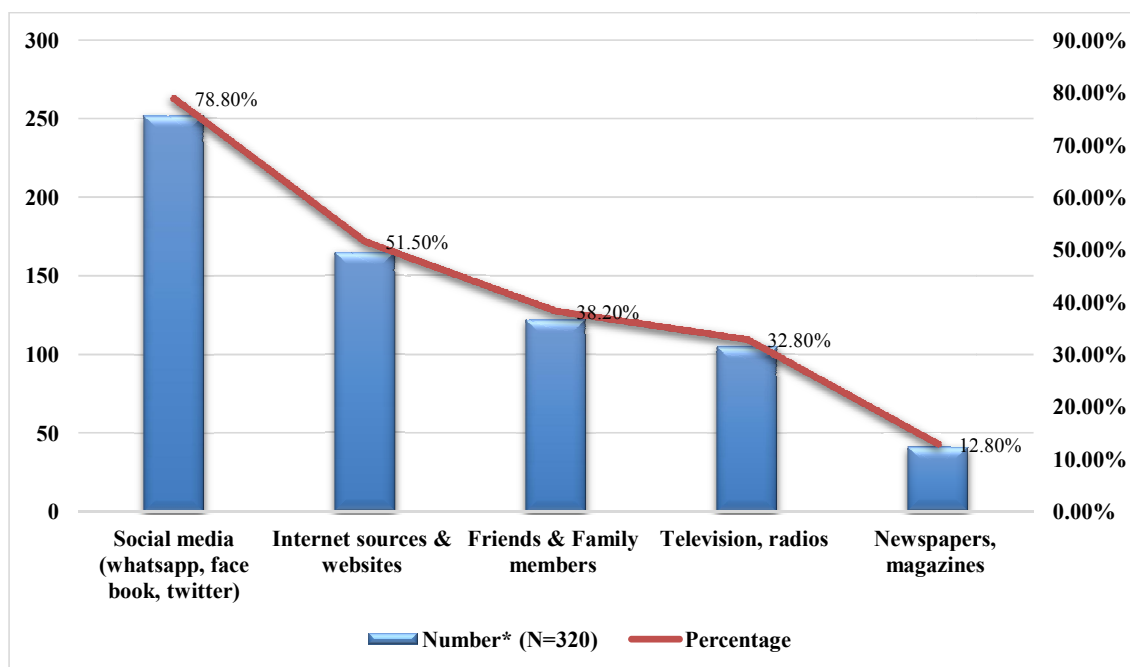


Fig. 1. Bar graph showing the percentage of awareness through different resource platform among the respondents

4. DISCUSSION

The present study on knowledge and perception of COVID-19 among health informatics students revealed that they have insufficient knowledge about COVID-19, but have sound knowledge on how to prevent the transmission of the virus. Out of 320 students who participated in the study; more than two-thirds possessed some knowledge of COVID-19, possibly due to the significant amount of information provided by the MOH in Saudi Arabia and the official WHO website. The study showed that almost 78% of respondents identified at least three or more signs and symptoms of COVID-19. However, the level of knowledge is much lower as compared to similar studies conducted in other countries [14, 15,16]. This could be due to the time of conducting the studies, as most studies were conducted during the later stages of the disease outbreak. A study among pharmacy students reveals that almost 98% of the respondents had knowledge about major symptoms of COVID-19 [15].

The study findings also revealed that a significant gap exists between student's knowledge about COVID-19 and the existing amount of available information about the pandemic, particularly, on modes of transmission of disease, and knowledge about ways of protection against COVID-19. For example, more than half of respondents (58%) have inadequate knowledge that the virus can infect a person if recently been in the areas where people affected with the virus, and 33% of respondents had inadequate knowledge that maintains healthy habits, including a balanced diet, physical activity, and gets plenty of sleep, is essential for the prevention of the disease. The students' perception of COVID-19 was disappointing as between 42 - 45% of them had given incorrect answer for the statements 'wearing masks is not necessary unless we are visiting sick patients', 'someone who has completed quarantine or has been released from isolation does not pose a risk of infection to other people' and 'antibiotics should not be used as a means of prevention or treatment of COVID-19 patients'. Similar findings were also reported in other studies [16,17]. The study showed huge discrepancies in the perceptions of COVID-19 among health informatics students, which necessitates the need for dissemination accurate information for improving the knowledge and perception of students about COVID-19 even among students in health-related academic programs.

One of the significant findings from this study is that one of the major sources of COVID-19 information among health informatics students was social media> This strongly supports the results from studies on the Middle East Respiratory Syndrome (MERS), which reported similar findings [18,19]. The other important source of information was the websites of the Ministry of Health (MOH) and WHO, which reflects that students are consistently dependent on internet sources as the major source of seeking information on COVID-19 in comparison to other sources. Since the majority of students rely on internet sources, and the huge diversity of information is available through the internet sources, including unverified and false information which can misguide the population, it is essential to enhance the availability of appropriate and relevant information on COVID-19 pandemic using effective health promotion platforms. In this context, MOH in Saudi Arabia has been constantly providing the public with COVID-19 related information on its official website.

5. CONCLUSION

The study findings demonstrate the importance of disseminating public health information on COVID-19 pandemic. As knowledge is a prerequisite for developing positive attitudes and promoting healthy behavior, university students should be provided with reliable health information messages to increase their knowledge about signs and symptoms, modes of transmission, and prevention strategies of COVID-19. The recently launched Saudi Ministry of Health web portal on COVID-19 in various languages may provide evidence-based information on conducting self-assessment, methods of infection prevention, and other educational health tips and guidelines to prevent the spread of the disease and for maintaining health of the population.

6. LIMITATIONS

The study has certain limitations, which need to be considered. This is a study conducted online among the students of the Health Informatics Program at Qassim University, Saudi Arabia during the first week of April 2020, when an alarming number of COVID-19 cases reported worldwide. As the study was conducted in one university, the findings that emerged from the study cannot be generalized at the national level. An extensive study involving many universities

and academic programs is necessary to assess the awareness and perception of university students in the Kingdom of Saudi Arabia. The responses received in the study were self-reported and dependent on the respondent's honesty. Despite these limitations, the study gives preliminary insights into the knowledge and perception of university students during the initial period of COVID-19 outbreak.

CONSENT

Informed consent was obtained from all respondents before they participated in the study.

ETHICAL APPROVAL

It is not applicable.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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