

Medical Students' Knowledge, Prevention and Perceived Risk of COVID-19

Conocimientos, prevención y riesgo percibido de COVID-19 en estudiantes de medicina

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Summary

Objective: to identify the knowledge, prevention behaviors and perceived risk of COVID-19 in medical students. **Methods:** descriptive, cross-sectional study. Students from a medical school participated from September to December 2020. The inclusion criteria were: to be enrolled in the first to tenth semester of the Medical Surgeon Bachelor's Degree, no matter age or gender, who agreed to participate in the research giving informed consent by answering an online survey consisting of 26 questions including fifteen items on knowledge of COVID-19, nine on prevention behaviors, and two on COVID-19 risk perception. Descriptive analysis was performed. **Results:** 912 surveys were included, 62.2% were female (n=567), 82% said they had received information related to COVID-19 from reliable information sources (n=748), 96.5% talked to their family and friends about prevention measures (n=880), 63.8% were unaware of N95 mask use during intubation, suctioning, bronchoscopy and cardiopulmonary resuscitation procedures (n=582) and 43.3% indicated that they were afraid of becoming infected (n=395). **Conclusion:** most of the participants reported having received adequate information to learn about aspects related to COVID-19, but were unaware of essential aspects such as the use of N95 masks. It is necessary to educate and inform the medical school student population in order to decrease the perception of risk and increase prevention behaviors.

Keywords: COVID-19; Knowledge; Students; Medicine; Prevention; Risk

Received: 11/26/2022
Accepted: 04/11/2022

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Suggestion of quotation: González-Pérez B, Salas-Flores R, Olvera-Mendoza V, Clemente-Martínez G, Sánchez-Márquez W, Reyes-Cruz S. Medical Students' Knowledge, Prevention and Perceived Risk of covid-19. *Aten Fam.* 2022;29(3):160-166. <http://dx.doi.org/10.22201/fm.14058871p.2022.3.82834>

Resumen

Objetivo: identificar los conocimientos, las conductas de prevención y riesgo percibido de COVID-19 en estudiantes de medicina. **Métodos:** estudio transversal descriptivo. Participaron estudiantes de una facultad de medicina, en el periodo de septiembre a diciembre de 2020. Los criterios de inclusión fueron: ser estudiante inscrito de primero a décimo semestre de la carrera de Médico Cirujano, cualquier edad y sexo, que aceptaron participar en la investigación y otorgaron consentimiento informado contestando una encuesta en línea que consta de 26 preguntas que incluyen quince ítems sobre conocimientos de COVID-19, nueve ítems sobre conductas de prevención y dos ítems sobre percepción del riesgo de COVID-19. Se realizó análisis descriptivo. **Resultados:** se incluyeron 912 encuestas, 62.2% fue de sexo femenino (n=567), 82% aseguró haber recibido información relacionada con COVID-19 en fuentes de información confiables (n=748), 96.5% platicó con sus familiares y amigos sobre las medidas de prevención (n=880), 63.8% desconoció el uso de mascarilla N95 durante procedimientos de intubación, succión, broncoscopia y reanimación cardiopulmonar (n=582) y 43.3% indicó que tenía miedo de infectarse (n=395). **Conclusión:** la mayoría de los participantes refirió haber recibido información adecuada para conocer aspectos relacionados con la COVID-19, pero desconocían aspectos esenciales como el uso de mascarilla N95. Es necesario educar e informar a la población estudiantil de la facultad de medicina para disminuir la percepción de riesgo y aumentar las conductas de prevención.

Palabras clave: COVID-19, conocimiento, estudiantes, medicina, prevención, riesgo

Introduction

In December 2019, a group of patients with pneumonia of unknown etiology, related to a epidemiologically linked to a seafood market in Wuhan City, Hubei Province, China, was reported.¹ The name of that new entity was coronavirus disease 2019 (COVID-19), given by the World Health Organization (WHO).²

One year after the emergence of COVID-19, 80,773,033 confirmed cases and 1,783,619 deaths had been reported world-wide, with a global case fatality rate of 2.2%.³ The first case of COVID-19 in Mexico was detected on February 27, 2020 and by April 30, 64 days after this first case, the number of cases increased exponentially reaching a total of 19,224 and 1,859 deaths.⁴ By November 19, 2021, the report in Mexico was 3,851,079 cumulative confirmed cases and 291,573 deaths.⁵ As of October 25, 2021, the cumulative cases of COVID-19 in health personnel, according to statistics from the Ministry of Health, was 283,122 in Mexico, distributed as follows: 38.9% nursing personnel, 32% other health care workers, 25.3% physicians, 2% laboratorians, 1.8% dentists; and 45% of 4,517 confirmed deaths, were of medical personnel.⁶

Since the beginning of the pandemic, the Mexican government, in coordination with the Ministry of Health, implemented measures to prevent and control the epidemic such as the National Social Distance Program, frequent hand washing, distance greeting, the “Stay-at-Home” campaign, the isolation of suspected or confirmed cases of COVID-19 and the suspension of “non-essential” activities.⁷ These public health measures, imposed to prevent the spread of the disease, posed a major

challenge to academic preparation, in particular medical education.^{8,9}

Due to the highly contagious nature of the virus, universities switched to a virtual mode, leading students to take classes remotely and cancel practical workshops, lectures, symposia and conferences. In addition to the fear of infecting family members, in the case of hospital interns, students have also suffered from the lack of preparation for the pandemic, as well as the psychological burden that this entails.^{10,11} These challenges have resulted in limited medical training due to the suspension of clinical rotations.¹²

Other challenges include the lack of knowledge and experience in the management of COVID-19 which may increase the risk of infection in this particular population. Given this context, the aim of this study was to identify the knowledge, prevention behaviors, and risk perception of COVID-19 in medical students.

Methods

A descriptive cross-sectional study was conducted with the participation of students from the Dr. Alberto Romo Caballero School of Medicine of the Autonomous University of Tamaulipas, from September to December 2020. Surveys were conducted to students who were in their academic cycle during the study period, through a non-random selection by convenience. The inclusion criteria were: students enrolled from the first to the tenth semester of the Medical Surgeon career, regardless age or gender, who agreed to participate in the research giving informed consent in the postgraduate area of the School of Medicine; the general objective, and procedures to follow were explained; questions regarding the study were solved. It was

made clear that their participation was entirely voluntary, and they could refuse to participate or stop their participation at any time, without any penalty or consequence. Exclusion criteria included students who provided incomplete data.

A four-section online survey was applied for the collection of information: sociodemographic data, knowledge related to COVID-19, prevention behaviors, and risk perception. Sociodemographic information included age, gender, school year completed, place of residence, whether the received information related to COVID-19 disease came from reliable sources in Spanish and English (WHO, Ministry of Health, Centers for Disease Control and Prevention, etc.) or from social networks.¹³⁻¹⁷ To identify knowledge related to COVID-19, an instrument based on a framework of previous studies using fifteen items was applied (two items on the basic science and etiology of COVID-19, two on symptoms and incubation period, one on diagnosis, two on transmission, four on public prevention, one on specific prevention in medical personnel, one on treatment, and one regarding referral of suspected cases) based on a framework of previous studies on MERS and a new review on COVID-19.^{18,19} The following sections included nine items on preventive measures and two on risk perception of COVID-19. The validity and reliability of the questionnaire obtained a Cronbach's alpha of 0.8.²⁰

The study was authorized by the Research Ethics Committee of the Dr. Alberto Romo Caballero School of Medicine of the Autonomous University of Tamaulipas. The collected data were coded to protect the students' information and only the researchers had access to the database.

The statistical analysis used was descriptive; quantitative variables were expressed as means and standard deviation, while nominal variables were expressed as frequencies and percentages. The data were processed in the SPSS v. 23 statistical program.

Results

A total of 1,053 surveys were carried out, of which 912 met the selection criteria. The average age of the studied sample was 20.1 ± 1.9 years; also, 62.2% were female (n=567). In relation to the school year, 76.8% were enrolled between the 1st and 5th semester of the Medical Surgeon degree (n=696), 28.5% were foreign students (n=260), 82% claimed to have received information related to COVID-19 from reliable sources (n=748), and 91.7% received information from social networks (n=837); see Table 1.

In relation to the identification of knowledge about COVID-19, 94.5% of the students identified the etiology of the disease (n=862). 63.8% were unaware of the use of N95 mask during intubation, suction, bronchoscopy and cardiopulmonary resuscitation procedures (n=582), and 85.2% of the students were able to identify a suspected case and refer it to a nearby medical care center (n=777), see Table 2.

Regarding COVID-19 prevention behaviors, most students followed the recommendations to prevent the disease and 96.5% talked to their family and friends about COVID-19 prevention measures (n=880), see Table 3.

Regarding risk perception by medical students, 41.6% have the perception that they may get infected with COVID-19 occasionally (n=379) and 43.3% indicated that they are afraid of getting infected (n=395), see Table 4.

Table 1. General Characteristics of the Studied Population

Variables	n	(%)
Gender		
Male	345	37.8
Female	567	62.2
Academic Level		
1st - 5th semester	696	76.8
6th - 10th semester	216	23.2
Place of residence		
Local	652	71.5
Foreign	260	28.5
Received information related to COVID-19 from reliable information sources		
Yes	748	82.1
No	164	17.9
Received information related to COVID-19 on social networks		
Yes	837	91.7
No	75	8.3

Table 2. Medical Students' Knowledge about COVID-19

Variables	n	(%)
COVID-19 -19 is a respiratory infection caused by a new species of virus of the coronavirus family		
False	50	5.5
True	862	94.5
The first COVID-19 case was diagnosed in Wuhan, China		
False	14	1.5
True	898	98.5
The origin of COVID-19 is unclear, but it appears to have been transmitted to humans through seafood, snakes or bats		
False	105	11.4
True	807	88.5
Common symptoms are fever, cough and shortness of breath, but nausea and diarrhea are rare		
False	51	5.6
True	861	94.4
The incubation period is up to 14 days with an average of 5 days		
False	15	1.6
True	897	98.4
It can be diagnosed by PCR testing of samples extracted from nasopharyngeal and oropharyngeal secretions or sputum and bronchial lavage		
False	19	2.1
True	893	97.9
Transmission is through respiratory droplets such as coughs and sneezes		
False	8	9
True	904	99.1
Transmission is through close contact with an infected case (especially in family members, crowded places and health centers)		
False	11	1.2
True	901	98.8
The disease can be prevented by hand washing and personal hygiene		
False	20	2.2
True	892	97.8
A medical mask is useful to prevent the spread of respiratory droplets during coughing		
False	11	1.2
True	901	98.8
The disease can be prevented by not having close contact such as shaking hands or kissing, not attending meetings and disinfecting hands frequently		
False	20	2.2
True	892	97.8
Everyone should wear face masks		
False	35	3.8
True	877	96.2
An N95 mask should be worn only during intubation, suction, bronchoscopy and cardiopulmonary resuscitation		
False	582	63.8
True	330	36.2
The disease can be treated with standard antiviral drugs		
False	553	60.6
True	359	39.4
If symptoms appear within 14 days after direct contact with a suspected case, the person should consult a nearby public health center		
False	135	14.8
True	777	85.2

Table 3. Prevention Behaviors on covid-19

Variables	n	(%)
Canceled or postponed meetings with friends, meals out and sporting events		
Yes	894	98%
No	18	-2%
Reduced use of public transportation		
Yes	902	98.90%
No	10	1.10%
Went shopping less frequently		
Yes	897	98.40%
No	15	1.60%
Reduced the use of enclosed spaces, such as the library, theaters and cinemas		
Yes	911	99.90%
No	1	0.10%
Avoided coughing around people as much as possible		
Yes	908	99.60%
No	4	0.40%
Prevented places where a large number of people gather		
Yes	898	98.50%
No	14	1.50%
Increased the frequency of cleaning and disinfection of items that can be easily touched by hands (i.e., door handles and surfaces)		
Yes	855	93.80%
No	57	6.30%
Washed hands more frequently than usual		
Yes	897	98.40%
No	15	1.60%
Discussed COVID-19 prevention with family and friends		
Yes	880	96.50%
No	32	3.50%

Table 4. Perception of Risk Regarding covid-19

Variables	n	(%)
I can get infected with COVID-19 more easily than others		
Never	235	25.8
Occasionally	379	41.6
Frequently	190	20.8
Very often	108	11.8
I am afraid of getting infected with COVID-19		
Never	101	11.2
Occasionally	180	19.7
Frequently	236	25.8
Very often	395	43.3

Discussion

The rapid spread of the COVID-19 pandemic has had a major impact on public health.²¹ Governments, health authorities, and the scientific community around the world are trying to control and contain infection, because this disease puts people at risk of developing life-threatening conditions.^{22,23} This presents a challenge for medical education, as the training of medical students is affected as a result of the closure of schools and faculties.²⁴

Because medical students' education was disrupted and the fear of getting the disease, and potentially infecting their family, friends, and anyone else they came in contact with, they were forced to acquire COVID-19-related knowledge from various sources and share it with those they were in contact.²⁵

This study found that more than half of the medical students obtained COVID-19 information from reliable sources with scientific rigor, and from social networks, which is similar to that reported by Saefi et al.²⁶ In this pandemic, some of the most relevant characteristics of social networking platforms have been the rapid dissemination of disease management protocols at regional, national and international levels. Sharing protocols on treatment, personal protective equipment, seminars in support of medical education, or the possibility of organizing collaborative research projects, surveys, and multi-center studies has become a constant.²⁷

The students participating in this study who were taking the basic and clinical subjects showed to have knowledge about COVID-19, this is similar to other reported studies.^{28,29} However, in the item of: "Only during

intubation, suction, bronchoscopy and cardiopulmonary resuscitation, N95 mask should be used” 63.8% of wrong answers were identified (n=582), since this is a special protection for medical professionals. According to the CDC recommendation, the N95 mask is preferred when performing or undergoing procedures that generate aerosols.³⁰ Hence, it is important that medical students graduating in the near future receive more courses on self-protection and correct handling of the COVID-19.

It was identified that most of the students implement the preventive measures toward COVID-19, similar to what was reported in another study.³¹ In addition, they reported discussing the preventive measures with their family and friends, which may effectively increase awareness of the current situation. This indicates the importance of health education that could improve prevention behavior toward COVID-19 in society.³²

Regarding risk perception about COVID-19, contrary to other studies reporting positive risk perceptions,^{33,34} this study identified that students were afraid of getting infected and infecting their loved ones. This implies that college students may be more concerned about their parents and other older family members than about themselves, an aspect that has been seen in another study.³⁵ Risk perception is an important factor influencing behavior. Students who have a low perceived risk of contracting COVID-19 disease are more likely to minimize preventive behaviors such as not wearing a face mask, and not being able to maintain social distance, while those who have a high perceived risk are more likely to take appropriate preventive measures.³⁶

A limitation of this study is its single-center nature, as well as exploratory weaknesses of the questionnaire, which may influence response biases in the studied population.

Conclusion

In this study, it was identified that medical students have knowledge about COVID-19 obtained from reliable information sources with scientific rigor and on social networking platforms, so programs should be contemplated in medical school to ensure continued access to online health information resources such as free courses, clinical management guidelines, and webinars on COVID-19 to improve their knowledge and awareness to decrease the risk perception of the disease and encourage the practice of preventive behaviors.

Authors' Contribution

B G-P: research problem statement, article development; R S-F: research design; V O-M: training, students; G C-M: advice, style editing; W S-M: discussion and conclusions, students; S R-C: analysis, information processing. All authors approve the publication of this paper.

Funding

The present research did not receive external funding.

Conflicts of interest

The authors declare not having conflicts of interest.

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