

Medical Students' Awareness of COVID-19 Against the Background of Remote Learning

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Abstract

The article presents an assessment of the knowledge and awareness of university students about the sources of COVID-19 data. The 27-question survey was conducted between 15 and 30 June 2020 with the participation of 142 medical university students. Conducted one-factor analysis of students' awareness of COVID-19, ways of obtaining vital health information, individual self-efficacy of preventive interventions in the conditions of pandemic stress, and remote learning was based on students' responses.

71.8% of respondents named the Internet and social networks as the sources of information on COVID-19. In the conditions of self-isolation, students' screen time had increased by 68%.

COVID-19 was assessed as a serious global threat to public health at an average of 4.3, with the threat of the virus spreading rated as sufficiently 'neurotic' (65.5%, with an average result of 3.06; SD=1.31). Respondents rated their chances to contract COVID-19 on average as 3.26 (SD=1.34), 52.8% regarded COVID-19 as threatening to health, and 47.2% expressed fear for loved ones and families. 65.5% cast some doubts about the imminent end of a pandemic threat.

Students demonstrated a lack of knowledge about COVID-19, but correctly noted the activities that reduce its spread. The uncertainty of the majority of respondents and the increased anxiety determine the lack of individual self-efficacy of interventions that reduce the risk of the virus spreading.

Therefore, the public requires continuous education and reliable facts on COVID-19 to address the problem of the abundance of misinformation posted on the Internet and social networking, both in the contexts of well-being and further pandemic development.

Keywords: COVID-19 • Health awareness • Pandemic stress • Public outbreak prevention

Introduction

Prevention of infectious diseases is carried out through the development and implementation of a set of legal, economic, social, and medical measures aimed at preventing the emergence, spread, and early detection of such diseases. Prevention of the occurrence of infectious diseases is the task of local government and state authorities, as well as employers, medical organizations, and public associations [1-3].

World Health Organization was informed on the detection of cases of pneumonia of unknown origin in Wuhan, China on December 31, 2019 [4]. Already on January 9, 2020, WHO reported that the pathogenic agent of the disease is a new coronavirus, which was temporarily named '2019-nCoV'. By mid-March 2020, the European Region was at the epicenter of a pandemic, with more than 40% of the world's confirmed cases [5].

An important governmental measure to prevent the transmission of a new virus is communication on health issues between public authorities, healthcare professionals, medical facilities, and the general public, including students of various educational institutions (especially medical) [6].

Medical facilities represent establishments with the highest risk of the spread of various infectious diseases; the quality of preventive measures implemented within their grounds largely determines the whole dynamic of the virus spread on a particular territory.

The exchange of scientific information, awareness of the general public, students, patients, specialists about COVID-19 is an effective way to increase the rapid response measures; it also determines the effectiveness of interventions of specialists at all levels struggling to contain the outbreak [7-10]. The Russian Federation, as well as the whole world, faced the need to close down some educational institutions and enterprises and also limiting the number of medical procedures carried out by medical facilities as measures to preserve the necessary physical infrastructure and human resources [3,11]. This is quite critical for the COVID-19 response, as an outbreak may simultaneously cause an increase in the need for medical personnel and a decrease in its availability [6,8,12]. In this situation, awareness of coronavirus infection among medical students is of great importance.

The social impact of COVID-19 may greatly vary some families have lost their loved ones, many family members are working at risk of COVID-19, their relatives have lost their jobs, but others live in regions not yet affected by the virus [13,14]. Preliminary data from several studies by the European Centre for Disease Prevention and Control report a high mortality rate (especially for those at risk) associated with the new virus; there is no effective medical treatment and vaccine at this time [5]. Students found themselves in self-isolation while in remote learning; thus, on the one hand, it gave them expanded opportunities to communicate with friends using electronic learning tools, but on the other hand, the isolation causes a number of experiences associated with the threat of the virus spread. In

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these conditions, it becomes important to obtain the necessary and reliable information on measures to prevent the spread and reduce the possibility of infection with COVID-19.

Medical students represent a unique population for assessing the awareness and level of objective knowledge about COVID-19 due to their future occupation and area of expertise. In the context of the transition to remote learning, students faced the need to stay within the information and communication space of social networks as much as possible; the same applies to the impact of electronic learning tools. Thus, the opportunity to learn the factual knowledge of the signs and symptoms of COVID-19, as well as a source of accurate and up-to-date information on public health and COVID-19, is of doubtful significance. Therefore, the purpose of the presented study was to assess the knowledge and awareness of university students and sources of information on COVID-19. Due to the rapid development of the novel virus pandemic, there is limited information on the public's awareness and beliefs about COVID-19 and related features of media and social media access.

Methods

The data was collected from June 15 to June 30, 2020, after students completed a course at the Department of Hygiene of Children and Adolescents. Also, many students were recruited earlier by the University to work in hospitals with identified COVID-19 patients.

The study was approved by the Institute, within the framework of the implementation of the developing research project 'Ensuring the hygienic safety of students' informational and educational environment in the context of the digital economy'.

The survey included questions regarding the subjective attitude of respondents concerning the implementation of public prevention measures and medical knowledge about the rules of behavior in the context of the outbreak of COVID-19; the survey also employed questions on the ways of obtaining COVID-19-related information in the context of remote learning.

The survey was based on the collation of information for the Institute's program 'Scientific substantiation of public health risks and the development of technologies for their prevention and minimization.' The survey aimed at studying the ways the students gain reliable knowledge on the outbreak in the conditions of self-isolation and student's awareness of the factors that contribute to reducing the spread of the new virus [7,15]. A random sample of 1,000 students currently enrolled in at least one medical class received an email invitation to participate in the survey. The response rate was 14.2%; thus wise 142 respondents started the survey with no financial or other interest in taking it. All respondents were students of medical universities, largely represented by the 3rd year students (35.2%, n=50) and juniors (38.8%, n=56).

Results

The respondents were distributed by gender as follows women (54.2%, n=77), men (45.8%, n=65). The median age was 21 (range 17-32, CI=20.31; 22.63). Most of the respondents use a tablet (72.7%), a cell phone (71.4%), and a computer (54.5%) in their daily activities; 23.4% of respondents use a laptop. 38.5% of the respondents has 2 electronic means in personal use, 24.4%-3%, every 5th one; and 16.6% of students possess 4 electronic means.

When asked about usual ways to receive healthcare information (including concerning certain diseases), all respondents named the Internet and social networks as the most frequent source, and only one in 10 mentioned television as a source of such information. Concerning the information resource on COVID-19, 89% pointed to a designated information website, and 20% of students reported that they visit Instagram in search of that information every day (n=126/28). Only 15% of respondents indicated that most of the COVID-19-related information was received through

television (15.4%, n=22).

Students were also offered to rate the statements 'The COVID-19 threat will end soon' and 'I am worried about getting infected with COVID-19' on a scale from 1 (totally disagree) to 5 (entirely agree). When assessing the degree of threat of COVID-19, the average result was 3.06 (SD=1.31). Overall, 23.2% expressed confidence in the end of the outbreak threat as 'somewhat agree' (n=33), and 42.3% had uncertainty or doubts about this statement (n=60). Thus, the subjectively surveyed students of the medical university perceive the situation of the threat of the new virus as rather 'neurotic' (65.5%). The average response when assessing the possibility of becoming infected with COVID-19 among the respondents was 3.26 (SD=1.34), i.e. 34.5% (n=49) 'somewhat agreed' with this statement, 18.3% expressed complete confidence in being infected with a new virus (n=26). Only 16.2% of students were confident of completely avoiding the threat of COVID-19 infection (n=23). Thus, more than half of the respondents subjectively assess the COVID-19 situation as a rather serious threat to their health.

Finally, students reported visiting various online news sources for information in daily life, including websites, electronic sources of scientific information (71.8%, n=102), Instagram (15%, n=14) and television news programs (10%, n=14) (Table 1).

Respondent feedback	Average value	Abs. count, n
Designated website, including electronic scientific information resources	71.8	102
Instagram	9.9	14
News App, including TV	9.9	14
Twitter	4.2	6
Facebook	4.2	6
Total responses		142

Table 1. Students' online reference sources.

The 2017 study on the quality of life of medical students has revealed that students spend an average of 3.2 ± 1.5 hours on preparing class assignments, while 45.9% of them spend a total of 4 to 6 hours a day communicating with the use of digital devices [16]. The presented study shows that students enrolled in remote learning spend an average of 6.7 hours on homework (SD=4.92, CI=5.89; 7.51), but with the use of averaged 8, 4 hours of screen time (SD=3.99, CI=7.75; 9.06).

Medical students rate COVID-19 as a serious global health threat on average 4.3 (SD=1.02), i.e. 66% of respondents entirely agree with this statement. 26.7% (n=32/6) expressed doubt and/or total disbelief that a treatment for the new virus will be developed. However, there were almost twice as many participants in the study with the opposite opinion (42.3%): They are more likely to agree and/or entirely agree (n=42/18) that the treatment will be more likely to be developed.

Only every 4th student (21.1%, n=30) correctly identified all three signs and/or symptoms of COVID-19 (i.e. fever, cough, shortness of breath). Another 32.5% of the surveyed (n=32) correctly added the phenomenon of anosmia to the main symptoms of COVID-19. About half of the students (47.2%) indicated that, first of all, they are worried that family and friends may contract COVID-19; still, averaged 3.71 (SD=1.11) were confident that they can protect themselves from infection, i.e. 59.9% of respondents partially or completely agree that they are able to protect themselves. Two-thirds of the respondents 62.7% expressed confidence that they should wear masks to protect against infection (on average 3.87 (SD=1.23, n=89)).

Although the students identified COVID-19 as a serious global threat

(Table 2), they also have expressed confidence in the ability of public health experts to do what is needed to keep the community safe (3.38 average (SD=1.23, n=67)).

Respondent feedback	Totally disagree	Entirely agree	M	SD
COVID-19 is a major global public health threat	1	5	4.3	1.02
I am worried that my family and/or friends will get infected with COVID-19	1	5	4.3	1.03
I am worried about getting infected myself	1	5	3.26	1.34
Public health experts will do everything possible to keep the community safe from COVID-19	1	5	3.34	1.39
I am confident that the government will keep the outbreak of COVID-19 under control in this country	1	5	2.61	1.21
Experts will develop treatment or cure for COVID-19 before things get too bad	1	5	3.24	1.07
COVID-19 threat will be over soon	1	5	3.06	1.31
I can protect myself from contracting COVID-19	1	5	3.71	1.11
I must use a face mask to prevent COVID-19 infection	1	5	3.87	1.23
Social/physical distancing is important to prevent the spread of COVID-19	1	5	4.25	1.0
I must wash my hands often with soap and water for at least 20 seconds	1	5	4.53	0.86
I have to avoid crowded places	1	5	4.39	0.94
The elderly are at highest risk of contracting COVID-19	1	5	4.37	1.08

Table 2. Students' COVID-19 awareness (n=142).

Noteworthy that the respondents did not have the same level of confidence in the government's ability to cope with this outbreak (on average 2.61 (SD=1.21), i.e. 48.5% of respondents were strongly unsure or partially confident in this statement (n=69).

The majority of participants are 83.8% (n=119) incorrectly reported that older people are 'at highest risk of contracting COVID-19' 89.4% (n=127) of students correctly identified 20-second hand washing as an appropriate measure to prevent the virus spread. Also, the respondents correctly indicated preventive measures to prevent the outbreak: social distancing (average 4.39, SD=1.0) and avoiding crowded places (average 4.39, SD=0.94).

Discussion

The presented study was conducted not at the very beginning of quarantine measures but when students had already accumulated a certain level of knowledge on COVID-19. All survey respondents had some level of medical education, and 61.2% of them were 3-6 year students. Despite a fairly high level of education, respondents were not aware of most of the factors associated with COVID-19, but 42.3% were confident in the forthcoming development of an effective treatment. Some of them (21.1%) correctly identified the three symptoms of COVID-19. Thus, insufficient knowledge of COVID-19 emphasizes the need to exchange additional information on specific diseases in an accessible way through the Internet and social networks, where student youth are already actively involved in

the search for information. As it becomes apparent, 71.8% of surveyed students received information through informational websites. Also, as the amount of misinformation disseminated on social media is constantly growing [17], and although the quality of information often lacks a sufficient scientific basis, the need for wider dissemination of health information, popularization of quality information, and its inclusion in existing online channels gains paramount importance in the face of the massive spread of such threats.

Thus wise, within the framework of the study, the most accessible sources of current information on COVID for 89% of respondents were the Internet and social networks (20%), and TV news (15%). This information appears quite significant for healthcare providers, practitioners, and managers, as well as university educators and individuals working with public health students to develop communication strategies to improve coverage and expand healthcare knowledge for the members of the public.

In conditions of self-isolation, remote learning students spend twice more time on homework compared to traditional education (on average 6.7 hours (SD=4.92, CI=5.89; 7.51), while the screen time of exposure to e-learning tools increased by 68%. In this regard, it is possible to assume an increase in health risks due to a significant decrease in physical activity and an increase in screen time and, possibly, to expect an increase in the need of students in subsequent medical care.

Medical students rate COVID-19 as a major global public health threat with an average of 4.3, while they express sufficient confidence in the ability of public health experts to do what is necessary to keep the community safe (average 3.38 (SD=1.23). When assessing the degree of threat of COVID-19, the average result was 3.06 (SD=1.31); 65.5% expressed doubts about the imminent end of the threat of a pandemic, which increases the feeling of anxiety. 52.8% of the surveyed students of medical schools expressed varying degrees of confidence in possible infection, and 47.2% were concerned about their loved ones and families. Only 16.2% of students were confident that they will completely avoid the threat of infection. More than half of the respondents subjectively assessed the COVID-19-related situation as a rather serious threat to their health. Thus, a high level of pandemic stress was revealed among respondents with a sufficiently high level of medical education. Meanwhile, the expected effectiveness of preventive measures in the face of the threat of the virus spread, *inter alia*, depends on the self-awareness of the problem and confidence in the correctness of the proposed measures, as well as a low level of anxiety in this regard (individual self-efficacy). The more overall well-being of the general public in conditions of pandemic stress, the more communication is organized with different strata and high-risk groups through the most accessible sources of news and health information. The submitted survey data is quite consistent with similar studies [18].

Just so, 60% of respondents partially or completely agree that they can ensure their protection. However, if maintaining the social distancing, washing hands, and avoiding crowded places were correctly noted as measures to reduce the virus spread, then the effectiveness of adhering to the mask regime caused confidence in only two-thirds of medical students (62.7%).

Nevertheless, the presented data cannot be generalized to other universities with different demographics. The responses may also represent biases misunderstood in the current unprecedented situation. Also, there is a range of differences in responses from the question to question and a decline in student completion rates that can affect results.

Conclusion

The results of the study demonstrate the importance of increasing the volume of public health information through reliable information channels and sources. Besides, students' belief that public health experts will develop solutions to tackle the COVID-19 pandemic could become widespread in society and influence future communication messages and strategies.

Government-advocated measures to reduce the outbreak of the virus should be guided by the opinions of public health experts, as they are not highly convinced of their effectiveness, which is proven by this study. There is still a need to strengthen engagement with different strata, including high-risk groups, through the most accessible news sources, as well as information content where the public can turn for reliable health facts. In a context of a pandemic, as well as general public well-being in a pandemic era, it is quite essential to generate and support medical awareness among wide groups of the population with the help of media-acclaimed public health experts, aimed at increasing knowledge of COVID-19 and disease prevention strategies. The majority of respondents believe they can prevent contracting the disease, which is why additional content about COVID-19 signs and symptoms and preventing strategies should be constantly disseminated through the community's social media and news partners.

The obtained results confirm the existence of a misconception about the greatest 'risk of infection' among the elderly even among students with medical knowledge. The findings confirm that the general public and, in particular, medical students require constant ongoing education and reliable reporting of known facts about COVID-19 to address the abundance of misinformation disseminated online and on social media.

Such surveys are important to meet the needs of various population groups, including students, in providing them with quality medical care. To reduce pandemic stress, it is essential to educate the public on the health culture, including the prevalence of adverse health risk factors related to lifestyles such as unhealthy diet and sedentary lifestyle. Of particular significance are the counseling on the rational organization of educational work and rest, prevention of learning fatigue, as well as measures to optimize remote education for students.

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