REVIEW

Knowledge, Attitude, and Practice During the COVID-19 Pandemic: A Review

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Abstract: The World Health Organization declared the novel coronavirus (COVID-19) outbreak a global pandemic on March 11, 2020 due to its rapid spread on a global scale. More than 118,000 cases had been reported in 114 countries, and mortality had reached a total of 4291. Scholars have suggested that the level of panic is correlated with knowledge and attitude among the population. This review presents a summary of knowledge, attitude, and practice during the COVID-19 pandemic among healthcare workers, medical students, and populations in the US, the UK, Italy, Jordan, and China in April 2020. Analysis reveals that the level of the knowledge was positive in general, and optimistic attitudes and good practices are held. Utility of substantial knowledge and positive attitudes and practices hopefully can control the spread of COVID-19.

Keywords: optimism, practice, COVID-19, pandemic

Introduction

Coronaviruses belong to the Coronaviridae family, have a diameter of 65–125 nm, and contain a single strand of RNA with lengths ranging from 26 to 32 kb. Coronaviruses comprise several types, such as alpha, beta, gamma, delta, SARS-CoV, H5N1 influenza A, H1N1 2009, and MERS-CoV.[1] At the end of 2019, Wuhan City, the capital city of Hubei province in China, experienced a new coronavirus outbreak that resulted in more than 1800 deaths and more than 70,000 reported cases of infection in the first 50 days since the outbreak.[1] The new virus is a member of the beta group of coronaviruses and was named the 2019 novel coronavirus (2019-nCov). Thereafter, the International Committee on Taxonomy of Viruses (ICTV) named the virus SARS-CoV-2 on February 11, 2020 and the disease as COVID-19.[2–4]

The World Health Organization (WHO) declared the novel coronavirus (COVID-19) outbreak a global pandemic on March 11, 2020.[5] COVID-19 spread very quickly with more than 118,000 cases reported in 114 countries and the number of deaths reaching 4291.[5] By May 25, 2020, COVID-19 cases reached 5,500,607 with 346,721 deaths.[6]

The common symptoms of COVID-19 include fever, dry coughing, and fatigue that may lead to serious symptoms, such as difficulty in breathing, chest pain, difficulty in talking, and moving.[7] SARS-CoV-2 can spread through human-to-human transmission and indirect contact with contaminated objects.[8] SARS-CoV-2 can be transmitted through body fluid droplets from the mouth or nose, which can spread when a person with COVID-19 coughs, sneezes, and talks.[7] Droplets typically cannot transverse more

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than six feet (almost two meters).[8] SARS-CoV-2 remains intact and contagious in droplets and can be suspended in the air for up to three hours.[8,9] Additionally, contaminated droplets can settle on objects such as plastic, stainless steel, copper, and cardboard.[9] A person can become infected if they touch the surface contaminated with SARS-CoV-2 objects and then make contact with mucous membranes such as the eyes, nose, or mouth.[8] Therefore, health experts advise frequent hand-washing with soap and water.[7]

Surveys of knowledge, attitude, and practice (KAP) can collect information on what is known, believed, and done by a specific population.[10] Such information is necessary because unclear information and negative attitude toward infectious diseases among the community may lead to distress and panic.[11] In this time of crisis, research on KAP is vital for understanding the public's level of awareness about the knowledge, attitude, and practice toward COVID-19.[12] This article aims to shed light in this regard.

Literature Search

A literature search was conducted in April 2020 on PubMed and EBSCO databases using the keywords "knowledge," "attitude," "practice," and "COVID-19". The search yield a total of 14 articles at initial search on PubMed and one article on EBSCO. Out of the 15 articles, the study excluded three review articles, one non-English article, one non-

COVID-19 article, and three articles without abstracts. Thus, the study obtained a total of seven articles for further discussion. Figure 1 presents a flowchart of the literature search.

Studies on KAP Toward COVID-19

Table 1 presents the seven selected articles on KAP during COVID-19. The articles used questionnaires as instruments with the number of respondents ranging from 240 to 6910 for a total of 17,487. The respondents consisted of health workers, hospital staff, health and non-health students, and sample populations from China, Italy, Iran, Jordan, the US, and the UK.

Knowledge

Table 2 features six articles on knowledge about COVID-19 among health workers in China, hospital staff in Italy, medical students from Iran and Jordan, and sample populations from the US, the UK, and China. In general, all articles reported considerable levels of knowledge about COVID-19.

A research conducted on 1357 health workers including doctors, nurses, and paramedics in China showed that medical doctors obtained higher knowledge scores compared with nurses and paramedics (doctors = 38.56 ± 3.31; nurses = 37.85 ± 2.63; paramedics = 36.72 ± 4.82).[13]
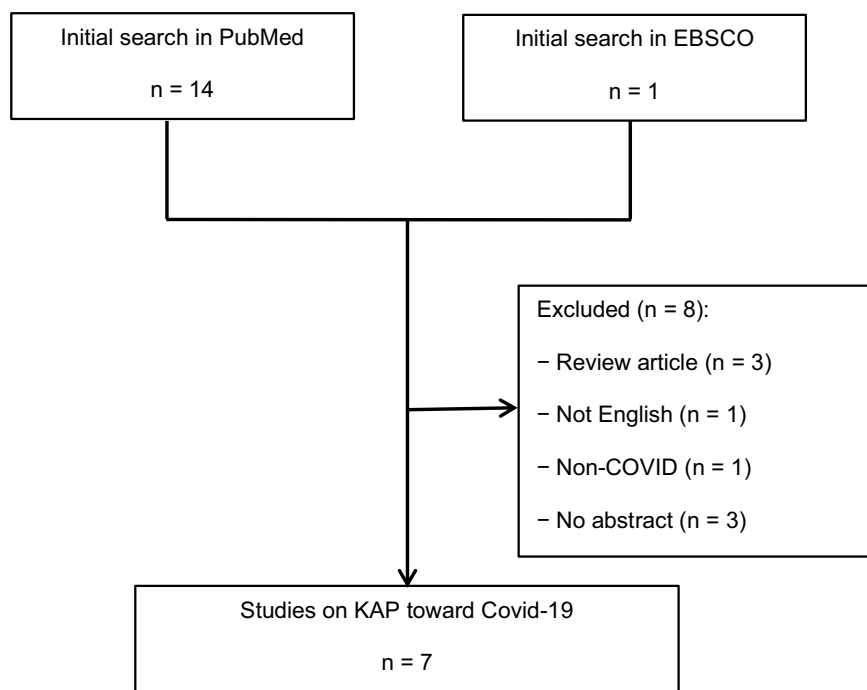

Figure 1 Flowchart of literature search.

Table 1 List of Articles

No.	Author	Type of Study	Country	Participants	Number of Participants	Instrument
1	Zhang[13]	Cross-sectional survey on KAP	China	Health workers	n = 1357	Questionnaire
2	Moro[14]	Cross-sectional study on KA	Italy	Hospital staff	n = 2046	Online questionnaire
3	Taghrir[15]	Survey on K	Iran	Medical students	n = 240	Questionnaire
4	Khader[18]	Cross-sectional study on A	Jordan	Dentists	n = 368	Online questionnaire
5	Geldsetzer[17]	Cross-sectional survey on K	US and UK	Population	US, n = 2986; UK, n = 2988	Online questionnaire
6	Zhong[12]	Cross-sectional survey on KAP	China	Residents	n = 6910	Online questionnaire
7	Alzoubi[16]	Cross-sectional study on KAP	Jordan	Medical and non-medical students	n = 592	Online self-administered questionnaire
				Total	n = 17,487	

Abbreviations: K, knowledge; A, attitude; P, Practice.

Table 2 Knowledge Studies

No.	Author	Country	Participants	Instrument	Knowledge Score	Knowledge Result
1	Zhang[13]	China	Health workers	Questionnaire	Doctors (38.56 ± 3.31) Nurses (37.85 ± 2.63) Paramedics (36.72 ± 4.82)	Approximately 89% of health workers obtained sufficient knowledge about COVID-19. Doctors showed higher knowledge scores than nurses and paramedics. The greater the knowledge of healthcare workers, the more confident they were in defeating the virus
2	Moro[14]	Italy	Hospital staff	Online questionnaire	Average of correct answers: Healthcare workers = 71.6% Non-healthcare workers = 61.2%	Among healthcare workers, a generally good knowledge on the topic was observed
3	Taghrir[15]	Iran	Medical students	Questionnaire	Average of correct answers of knowledge = 86.96%; 79.60% = high level 13.8% = moderate level 6.7% = low level	Iranian medical students had a high level of related knowledge and high performance in preventive behaviors, but moderate risk perception
7	Alzoubi[16]	Jordan	Medical and non-medical students	Online self-administered questionnaire	Average score 0.81 ± 0.15 (SD)	The overall understanding about the virus was good and knowledge about the major symptoms, such as fever, cough, and difficulty in breathing
5	Geldsetzer[17]	US, UK	Population	Online questionnaire	NA	Participants generally had good knowledge of the main mode of disease transmission and common symptoms of COVID-19
6	Zhong[12]	China	Residents	Online questionnaire	Average score 10.8 (SD: 1.6; range: 0–12)	Good knowledge

Compared with frontline health workers who have direct contact with confirmed and suspected patients, non-frontline workers displayed low levels of confidence to fight the virus (OR = 0.562; 95% CI: 0.376, 0.839).[13] In Italy, respondents from 2046 hospital staff showed that, in general, healthcare workers possessed good knowledge.[14]

A research on medical students from Iran indicated that such students have an average of 96% correct answers with 79.60%, 13.8%, and 6.7% of students holding high, moderate, and low levels of knowledge, respectively.[15] In Jordan, medical and non-medical students obtained an average score of 0.81 ± 0.15 (SD), where 90% of the participants had good knowledge of COVID-19 symptoms and more than 80% are aware of the lack of vaccine and treatment for COVID-19. No significant differences were observed regarding knowledge between medical and non-medical students.[16] The cited sources of knowledge about COVID-19 are social media (34%), the WHO (19.9%), TV (17.6%), the Internet (13%), the Ministry of Health (10.1%), and colleagues (5.4%).[16]

Research conducted in the US and the UK revealed considerable knowledge among respondents about the transmission, spread, and symptoms of COVID-19.[17] However, a portion of the populations cited misconceptions about the prevention of the disease. Nevertheless, the difference in knowledge and misperception between the US and the UK participants is non-significant.[17] Another study in China on 6910 residents argued that the level of knowledge of the residents was positive with a score of 10.8 (SD: 1.6; range: 0–12).[12]

Attitude Toward COVID-19

Table 3 shows the five articles that discussed attitudes toward COVID-19. The study on health workers in China indicated that knowledge directly influenced attitudes. Approximately 85% of health workers were afraid of being infected while working, whereas 60% experienced anxiety when working in isolation rooms and intensive care units.[13] The study on hospital staff from Italy proposes that more than 41% of the respondents avoid crowded places as a precautionary measure. Furthermore, healthcare workers generally were more aware of COVID-19 compared with the public.[14]

Table 3 Attitude Studies

No.	Author	Site of Research	Participants	Instrument	Attitude Score	Result
1	Zhang[13]	China	Health workers	Questionnaire	NA	This investigation found that knowledge directly affected attitudes. Approximately 85% of the surveyed HCWs were afraid of becoming infected at work. In isolation wards and ICUs, nearly 60% of the respondents showed relatively sufficient or excessive worry about COVID-19
2	Moro[14]	Italy	Hospital staff	Online questionnaire	NA	More than 41% suggested avoiding crowded places, and healthcare workers were more aware and correctly answered questions about COVID-19
4	Khader[18]	Jordan	Dentists	Online questionnaire	NA	A total of 304 dentists (82.6%) reported that they avoided handling patients suspected with COVID-19; 161 dentists (43.8%) mentioned that they preferred that patients visit the hospital and opt not to treat them, 17 dentists (4.6%) cited that they will refuse to treat patients with COVID-19 symptoms and order them to leave the clinic, and 182 dentists (49.5%) agree that they will treat such patients and advise them to visit the hospital afterward
7	Alzoubi[16]	Jordan	Medical and non-medical students	Online self-administered questionnaire	Average score 0.82 ± 0.07 (SD)	Overall high level of attitude. Nearly all participants (99.7%) agreed that hand-washing is necessary for personal hygiene to prevent infection, and approximately 68.4% considered mask wearing as effective
6	Zhong[12]	China	Residents	Online questionnaire	NA	The vast majority of the participants also held an optimistic attitude toward the COVID-19 epidemic

Furthermore, the research on 368 dentists in Jordan revealed that more than half of the participants (n = 203; 55.2%) deemed that the symptoms of COVID-19 can be resolved over time and thus do not require special treatment.[18] A total of 275 dentists (74.7%) agreed that implementing social distancing among patients in the clinic, wearing a mask in the waiting room, and hand-washing before entering the treatment room can prevent the spread of the virus during dentist appointments. However, 80 respondents (21.7%) believe that such measures are not important and do not cause excessive panic.[18] A total of 304 dentists (82.6%) reported that they refrain from handling patients that display COVID-19 symptoms, whereas 161 dentists (43.8%) mentioned that they preferred that patients with symptoms visit the hospital instead of their clinics. Furthermore, 17 dentists (4.6%) expressed that they will refuse to treat patients with COVID-19 symptoms and advise them to leave the clinic. In contrast, 182 dentists (49.5%) confirmed that they will treat the patient, but advise them to visit the hospital afterward.[18]

A study on health and non-health students from Jordan indicated that such students possessed high levels of attitude with an average score of 0.82 ± 0.07 (SD).[16] The study showed that nearly all participants (99.7%) agreed that hands should be regularly washed for personal hygiene. In terms of avoidance, approximately 68.4% of the participants expressed that using masks can prevent viral infections, 81.8% and 79.4% agreed that smoking and antibiotics cannot prevent infection, 94.6% cited that they will divulge if they are infected, and 93.6% will visit hospitals if infected.[16]

The study in China on residents as respondents found that residents in general hold an optimistic attitude toward the COVID-19 pandemic. As many as 90.8% are hopeful that COVID-19 will be successfully controlled, and 97.1% are confident that China will win against the virus.[12]

Practice Toward COVID-19

Table 4 presents three articles on the practice of COVID-19 conducted in China and Jordan.[12,13,16] The study on health workers in China showed that 89.7% of health workers followed correct practices for handling COVID-19 cases.[13] In this review, practice is related to work experience, work hours, and other factors.[13] The practice of residents toward COVID-19 indicated that Chinese residents avoid crowded places (96.4%) and wore masks when leaving home (98.0%) during the period of the rapid spread of COVID-19.

The Jordan study on health and non-health students obtained an average score of 0.78 ± 0.2 (SD) in terms of practice. In other words, students displayed favorable practices toward COVID-19 prevention, such as hand-washing, refraining from shaking hands, and following the etiquette of coughing and sneezing.[16]

Importance of Increasing Knowledge About COVID-19

This review study revealed that among seven studies on knowledge, attitude, and practice during pandemics, six studies showed that respondents have good knowledge about COVID-19, five studies found a good and optimistic attitude among respondents, and three studies indicated that respondents have good practices. The findings also indicated that knowledge directly influenced attitudes. Increasing knowledge among communities through health education is important because COVID-19 has been declared a pandemic. As such, the increased knowledge

Table 4 Studies on Practice

No.	Author	Country	Participants	Instrument	Practice Score	Result
1	Zhang[13]	China	Health workers	Questionnaire	NA	A total of 89.7% of the surveyed healthcare workers followed correct practices regarding COVID-19, consistent with research showing that practices are associated with work experience, work hours, and other factors
7	Alzoubi[16]	Jordan	Medical and non-medical students	Online self-administered questionnaire	Average score 0.78 ± 0.2 (SD)	Overall high levels of attitude and good practice toward preventive measures and responses if infected with COVID-19
6	Zhong[12]	China	Residents	Online questionnaire	NA	Most Chinese residents practice appropriate measures to prevent COVID-19

will influence the attitude and practice toward COVID-19.[12] KAP is strongly correlated with the incidences of many infectious diseases.[19] In the modern society, social media are one of the tools that can be utilized to enhance knowledge among communities. Based on the study in Iran, the students cited that their sources of knowledge about COVID-19 are social media (34%), the WHO (19.9%), TV (17.6%), the Internet (13%), the Ministry of Health (10.1%), and friends (5.4%).[16] A global public health campaign strategy to increase knowledge should be conducted to help in controlling the spread of the disease. In this regard, everybody should work together to eradicate this pandemic.

Conclusion

The review summarized seven articles in relation to KAP studies toward COVID-19. Six studies showed that respondents have good knowledge about COVID-19, five studies found a good and optimistic attitude among respondents, and three studies indicated that respondents have good practices and followed such practices related to COVID-19. Good KAP is a tool that can hopefully be used to control the spread of COVID-19.

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Disclosure

The authors report no conflicts of interest in this work.

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