Knowledge, Awareness, and Attitudes Towards COVID-19 Pandemic Among Different Populations in Central China: A Cross-Sectional Survey

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Huifang Xu[1*] MD, PhD; Maria Jose Gonzalez Mendez[2*] MSc; Lanwei Guo[1] MD, PhD; Qiong Chen[1] MD, PhD; Liyang Zheng[1] BSc; Peipei Chen[1] BSc; Xiaoqin Cao[1] MD, PhD; Shuzheng Liu[1] MD, PhD; Xibin Sun[1] BSc; Shaokai Zhang[1] MD, PhD; Youlin Qiao[1, 3] MD, PhD

[1]Department of Cancer Epidemiology Affiliated Cancer Hospital of Zhengzhou University/Henan Cancer Hospital Zhengzhou CN
[2]School of Public Health Dalian Medical University Dalian CN
[3]Department of Epidemiology National Cancer Center/National Clinical Research Center for Cancer/Cancer Hospital Chinese Academy of Medical Sciences and Peking Union Medical College Beijing CN
[*]these authors contributed equally

Corresponding Author:
Shaokai Zhang MD, PhD
Department of Cancer Epidemiology
Affiliated Cancer Hospital of Zhengzhou University/Henan Cancer Hospital
127 Dongming Rd
Jinshui District
Zhengzhou
CN

Abstract

Background: COVID-19 pandemic threats the health systems of many countries around the world. Several studies suggested that the pandemic affects not only physical health but also all aspects of society, including mental health. Multiple information has been released about the disease since the beginning of the outbreak. For that reason, it is important to investigate the level of knowledge, awareness, and the attitude that different populations had towards COVID-19 during the peak of the pandemic.

Objective: This research aims to assess the knowledge, awareness, and attitude about COVID-19 of different populations in Central China during the critical period of the outbreak.

Methods: A cross-sectional web-based survey was applied in Central China during February to March 2020 in three different population groups: medical workers, students, and other occupations. An online questionnaire was designed to collect information about four main areas: sociodemographic information, knowledge related to COVID-19, awareness, and attitude towards COVID-19. Counts and proportions were calculated per each question and McNemar's test was used to compare the distribution among groups. The differences between the groups were considered statistically significant if the p-value was lower than 0.05

Results: This study evaluated a total of 518 participants. Of them, 389 were students, 39 medical workers, and 90 other occupations. Most of the participants were female (n=278, 53.67%), lived in rural areas (n=263, 50.77%), and were single (n=433, 87.12%). The educational level of majority of the respondents corresponded to college and above (n=462, 89.19%). Most of the participants declared to know about COVID-19 by January, and most of them looked for information on social media (Sina Weibo, 84.36%), and WeChat and QQ groups (74.13%). Questions about COVID-19 knowledge were well known by the three groups with no significant differences observed. However, medical workers showed significant differences in the knowledge of professional questions. Medical workers and other occupations group stated that their level of concern was very high with 71.79% (n=28) and 52.22% (n=47) respectively. All three populations thought that lockdown policy had a serious impact on their life. Most of the respondents declared to have an overall positive attitude to the disease, showing a percentage of 92.03% (n=358) for students, 94.87% (n=37)for medical workers, and 92.22% (n=83) for other occupations group

Conclusions: The participants of this study had an adequate knowledge about COVID-19 and a positive attitude towards the disease. However, most of them recognized to be highly concerned about the virus and declared that the lockdown had a serious influence on their lives.

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Huifang Xu[(*)1], Maria Jose Gonzalez[(*)2], Lanwei Guo[1], Qiong Chen[1], Liyang Zheng[1], Peipei Chen[1], Xiaoqin Cao[1], Shuzheng Liu[1], Xibin Sun[1], Shaokai Zhang[(#)1], Youlin Qiao[(#)1,3]

[1]Department of Cancer Epidemiology, Affiliated Cancer Hospital of Zhengzhou University/Henan Cancer Hospital, Zhengzhou,450008, China

[2]School of Public Health, Dalian Medical University, Dalian,16044, China

[3]Department of Epidemiology, National Cancer Center/National Clinical Research Center for Cancer/ Cancer Hospital, Chinese Academy of Medical Sciences and Peking, Union Medical College, Beijing, 100021, China

[*] Huifang Xu and Maria Jose Gonzalez contribute equally to the article.

[#] Shaokai Zhang and Youlin Qiao contribute equally to the article.

[#]Correspondence to:

Shaokai Zhang, Ph.D. Department of Cancer Epidemiology, Affiliated Cancer Hospital of Zhengzhou University/Henan Cancer Hospital, Zhengzhou,450008, China Tel.: 86-0371-6558-7346, Email: shaokaizhang@126.com

Background: COVID-19 pandemic threats the health systems of many countries around the world. Several

studies suggested that the pandemic affects not only physical health but also all aspects of society. Multiple information has been released about the disease since the beginning of the outbreak. For that reason, it is essential to investigate the level of knowledge, awareness, and the attitude that different populations had towards COVID-19 during the critical period of the outbreak.

Objective: This research aimed to assess the knowledge, awareness, and attitude towards COVID-19 pandemic among different populations in Central China during the critical period of the outbreak.

Method: A cross-sectional web-based survey was conducted in Central China from February to March 2020. The study participants included three different populations: medical workers, students, and other occupations. In the current study, a questionnaire was designed to collect information in the following four aspects: sociodemographic information, knowledge related to COVID-19, awareness, and attitude towards COVID-19. McNemar's test and Fisher test were used for comparison among groups. The level of significance was set at $p < 0.05$.

Results: This study enrolled a total of 508 participants. Of them, there were 380(74.8%) students, 39 (7.7%) medical workers, and 89 (17.5%) other occupations. Most of the participants were female (n=272, 53.5%), lived in rural areas (n=258, 50.8%), and were single (n=423, 86.9%). The educational level of the majority of the respondents was college and above (n=454, 89.4%). Most of the participants declared to have heard about COVID-19 by January, and most of them looked for information on social media (Sina Weibo, 84.7%), and WeChat and QQ groups (74.2%). The participants of the three groups showed an adequate level of knowledge about COVID-19 with no significant differences among the groups. However, medical workers demonstrated a slightly advanced knowledge in professional items such as the potential susceptible population, possible host, treatment of COVID-19, disease category, and treatment. A higher proportion of medical workers (71.8%) and other occupations group (52.8%) highly concerned towards COVID-19 pandemic. More than 43% of the participants considered that the lockdown of their village/city had a significant impact on their lives. Nevertheless, the majority of respondents declared to have an overall optimistic attitude towards the

control of disease, showing a percentage of 92.1% (n=350) for students, 94.9% (n=37) for medical workers, and 92.3% (n=83) for other occupations.

Conclusions: All three groups reported an adequate background knowledge about COVID-19 but medical workers showed a slightly advanced knowledge in professional questions. Most of the participants were highly concerned about COVID-19 during the critical period of the outbreak. The majority of responders declared that the village/city lockdown policy had a significant impact on their daily life but most of them held an optimistic attitude towards the control of COVID-19.

Keywords: COVID-19; Knowledge; Awareness; Attitude.

Introduction

The spread of the coronavirus disease 2019 (COVID-19) was rapid around the globe and it has led to an economic crisis alongside a healthcare crisis in many countries and regions across the world [1]. It was declared a pandemic by the World Health Organization (WHO) on March 11th, affecting 114 countries by that time [2]. Even today, COVID-19 is still a threat to the health systems of nearly 150 countries and regions, especially those dealing with an international health emergency for the first time. In China, authorities and citizens acted quickly and effectively to contain the spread of COVID-19. The measures taken included several lockdown policies and strict preventive measures across the country [3], offering a model of response to COVID-19 pandemic control to other countries and regions.

The increasing spread of computers, tablets, and smartphones creates a chance for the rapid dissemination of information through the internet and social media, but it lacks an effective guarantee of quality. As with previous epidemics such as Ebola or Zika virus disease, internet has become a favored mechanism for the spread of misinformation regarding COVID-19 pandemic [4]. Besides, it has been reported that social distancing promotes the spread of misinformation and has a profound impact on psychological wellbeing in vulnerable populations. The misinformation may lead to uncertainty that is increased by the novelty of the disease [5]. Therefore, it is essential to raise awareness and distribute accurate knowledge about COVID-19 to avoid misinformation and decrease unnecessary stress upon population psychology. Studies have described

the effects that the pandemic can have on specific groups such as medical workers [6], children and teenagers [7], older adults [8], and students [9]. In China, a study conducted by Yulan Lin and colleagues determined the knowledge, attitudes, impact, and anxiety levels of the general population in relation to COVID-19 outbreak [10]. However, the coverage of knowledge and attitude related items in their study was limited to the symptoms and transmission way of COVID-19 and did not explore the differences among different population groups. To avoid the above limitations, the current study was designed and conducted to evaluate knowledge, awareness, and attitude towards COVID-19 of different populations groups in Central China during the critical period of the outbreak. This information might be necessary for policymakers to promote health education campaigns to better control the disease before the availability of the preventive vaccine. Due to no available vaccines or effective antiviral treatment against COVID-19, an active engagement of the population in preventive behaviors is necessary. For that reason, an adequate knowledge, high level of awareness, and an optimistic attitude are crucial for controlling COVID-19.

Materials and Methods

Study design and participants

The current study is the Central China part of a population based multi-center cross-sectional online survey, conducted in seven geographical regions across China (Northeast China, East China, South China, North China, Northwest China, Southwest China, and Central China) between February to March 2020. The anonymous survey was conducted via Wenjuanxing, an online crowdsourcing platform in mainland China that provides professional online questionnaire survey, voting, testing, and comments. The questionnaire was developed to investigate the knowledge, awareness, and attitude towards COVID-19 pandemic in different populations (medical workers, students, and other occupations) which contained demographic background, knowledge, awareness, and attitude related items.

The inclusion criterion was that the respondents were 18 years old or above at the moment of answering the survey. Thus, anyone that had the ability to complete this survey and met the age requirement was qualified to take part in the study. According to the occupation, responders in the current study were divided into three different population groups: students, medical workers, and other occupations.

Before starting the online questionnaire, a brief introduction of the study was displayed to each participant, and an electronic informed consent was obtained if they agreed to fill the questionnaire.

To attest the quality of the online survey, two control items were included in the questionnaire. The first one was gender, although gender information was recorded initially, it appeared one more time in the questionnaire with confusing options. Another control item was the question about whether the influenza vaccine can prevent COVID-19. Two different descriptions were displayed, and the answers for control items were supposed to match. Moreover, the members of the research team had been well-trained to ensure the quality of the questionnaire. Data cleaning and checking were done once the questionnaire was submitted.

Sociodemographic information

In the questionnaire, all the following sociodemographic information were collected from all the participants: gender, ethnicity, date of birth, marital status, household type, education background, monthly income, occupation, and smoking status and drinking status.

In the present study, respondents were identified as current smoker/drinker if they reported to be active smoker/drinker in usual.

Knowledge and awareness

The participants' knowledge was assessed using series of questions related to COVID-19. The questions included the following items: "Did you hear about COVID-19?", "When did you hear about COVID-19?", "Do you agree that COVID-19 is the same as influenza virus?", "Do you agree that COVID-19 is the same as SARS?", "Do you agree that influenza vaccine can prevent COVID-19?", "Which level is the category and treatment of COVID-19 classified in China?", "What is the possible host for COVID-19?","Which population group is susceptible to COVID-19? ", "How long is the incubation period for COVID-19?", "Do you think that COVID-19 is contagious during the incubation period?", "Is there any effective treatment for COVID-19?", "When do you think that it is necessary to wear a mask during COVID-19 pandemic?", and "Do you know that COVID-19 has been declared to be a Public Health Emergency of International Concern (PHEIC)?".

Attitude towards COVID-19 pandemic

In this section, the following items were designed to determine the populations' attitude towards COVID-19: "What is your level of concern about COVID-19?", "How often do you check updates about COVID-19?", "What impact does the village/city lockdown policy have on your daily life?", "What is your attitude toward COVID-19 pandemic control?", "Do you think that COVID-19 could be a global outbreak?".

Ethical Considerations

This study protocol was approved by the Ethics Committee of Jining Medical College (JNMC-2020-KY-001).

Statistical Analysis

We calculated counts and proportions for count data in the questionnaire. Bar plots were used if necessary. The McNemar's test was used to compare the differences in count data of groups. Fisher test was applied to data that was not qualified for McNemar's test due to the small size of the sample. The differences between groups were considered statistically significant if the *p*-value was less than 0.05. All statistics were completed by SAS 9.5 (SAS Institute Inc., NC, USA).

Results

Sociodemographic Characteristics

Table 1 summarizes the sociodemographic characteristics of respondents by group. In current study, a total of 822 questionnaires were collected, 508 were qualified for analysis, and 314 were excluded due to inconsistence in control items or age limitation.

Of the 508 respondents, there were 380(74.8%) students, 39 (7.7%) medical workers, and 89 (17.5%) other occupations. The mean age was 24.1 years old with 21.5 for students, 29.6 for medical workers, and 32.8 for other occupations, respectively. 272(53.5%). participants were female. A slightly higher percentage of participants lived in rural areas (n=258, 50.8%) than urban areas (n=250, 49.2%), and most of them were single (n=423, 86.9%). The educational level of the majority of the respondents was college and above

(n=454, 89.4%). For monthly income, 58.7% had no income, especially students (76.9%). Most of the participants declared not currently smoking (n=452, 89%) or drinking (n=344, 67.7%).

Table 1. Sociodemographic characteristic distributions of participants by occupation group

	Students (n, %)	Medical workers (n, %)	Other occupations (n, %)	Total (n, %)
Age (mean ± SD, years)	21.5±3.48	29.6±4.03	32.8±9.95	24.1±6.95
Gender				
Male	190(50)	12(30.78)	34(38.2)	236(46.5)
Female	190(50)	27(69.2)	55(61.8)	272(53.5)
Ethnicity				
Han	367(96.6)	39(100)	88(98.9)	494(97.2)
Others	13(3.4)	0(0)	1(1.1)	14(2.8)
Household type				
Urban	161(42.4)	30(76.9)	59(66.9)	250(49.2)
Rural	219(57.6)	9(23.1)	30(33.7)	258(50.8)
Marital status				
Single	372(100)	16(61.5)	35(39.3)	423(86.9)
Married	0(0)	8(30.8)	51(57.3)	59(12.1)
Others	0(0)	2(7.7)	3(3.4)	5(1.0)
Education level				
≤High school	2(0.5)	5(12.8)	47(42.8)	54(10.6)
College and above	378(99.5)	34(87.2)	42(47.2)	454(89.4)
Monthly Income				
No income	292(76.9)	0(0)	6(6.7)	298(58.7)
4000	86(22.6)	8(20.5)	23(25.9)	117(23.0)
≥4000	2(0.5)	31(79.5)	60(67.4)	93(18.3)
Current smoker				
No	341(89.7)	34(87.2)	77(86.5)	452(89.0)

Yes	39(10.3)	5(12.8)	12(13.5)	56(11.0)
Current drinker				
No	257(67.6)	27(69.2)	60(67.4)	344(67.7)
Yes	123(32.4)	12(30.8)	29(32.6)	164(32.3)

Knowledge and awareness about COVID-19

Almost all of the respondents affirmed to have heard about COVID-19 (99% of students, 100% of medical workers, and 98.9% of other occupations). A higher proportion of medical workers (n=18, 46.2%) and students (n=155, 40.8%) heard about COVID-19 by December 2019. However, a sizeable percentage of the responders declared knowing about COVID-19 between January 1st to 20th, especially other occupations (52.8%) and students (49.5%).

Regarding the host of COVID-19, all medical workers reported that it was possibly a wildlife animal (e.g., bats), 98.7% of students and 95.6% of other occupations had the same choice. When the participants were asked about the most susceptible populations to COVID-19, 44.5% of the students and 41.6% of other occupations thought that middle-aged and elderly were more vulnerable. In contrast, 66.7% of medical workers answered that all ages were susceptible. The majority of the participants agreed that the incubation period of COVID-19 was between 1-14 days (85.6% to 92.3%), and over 98% of them agreed that the virus was contagious during the incubation period. Concerning the treatment, most of the participants knew that there was not an effective available treatment against COVID-19, especially medical workers (97.4%) and other occupations (93.3%). Besides, 97.4% of medical workers (n=38) knew that COVID-19 was declared a PHEIC by the end of January, followed by students (n=319, 89%) and other occupations (n=78, 87.6%).

Regarding the use of masks, most of the participants agreed that is was necessary to wear a mask when going outside with 90.5% (n=344), 87.2% (n=34), and 85.4% (n=76) for students, medical workers, and other occupations group, respectively. This proportion was significantly higher than that of people agreed to wear a mask in crowded place.

As to the comparison between COVID-19 with other virus diseases, most of the students (n=321, 84.5%), other occupations group (n=77, 86%), and all medical workers (n=39, 100%), knew that COVID-19 and influenza virus were not the same. Correspondingly, a high proportion of students (n=319, 84%), medical workers (n=37, 94.9%), and other occupations (n=76, 85.4%) answered that COVID-19 was different from the

Severe Acute Respiratory Syndrome (SARS). When participants were asked if the influenza vaccine can prevent COVID-19, a low proportion of students (n=33, 8.7%), medical workers (n=1, 2.6%), and other occupations (n=7, 7.9%) responded 'Yes'.

Although the majority of knowledge about COVID-19 was well known by the participants with no significant differences observed among the groups, medical workers showed a significant advanced knowledge in professional questions (**Table 2**).

Regarding the sources used to search information about COVID-19, most of the participants obtained information by social media platform (Sina Weibo, 84.7%), and WeChat and QQ groups (74.7%). The least used source to get information were newspapers and magazines (3.4%) in all the groups **(Figure 1).**

Attitude towards COVID-19 pandemic

The level of concern showed significant differences among the three groups. A higher proportion of medical workers declared to be highly concerned (n=28,71.8%), followed by other occupations (n=47,52.8%) and students (n=149, 39.2%). The frequency of checking updates also showed significant differences among the groups. Regarding the number of times checking updates about COVID-19, 48.2% of students (n=183) affirmed to check once per day, and other occupations (n=41, 46.1%). On the other hand, the proportion of medical workers that checked the updates once a day (n=18, 46.2%), was slightly lower than the proportion of them that checked updates more than once per day (n=19, 48.7%). The proportion of participants that thought that COVID-19 would not be a global outbreak was 71.3% (n=271), 79.5%(n=31), 69.7%(n=62) for students, medical workers, and other occupations, respectively.

Regarding the village/city lockdown policy, most of the participants from the three groups stated that the policy had a significant impact on their daily life, as follows; 55.3% (n=210) for students, 43.6%(n=17) for medical workers, and 43.8% (n=39) for other occupations. Nevertheless, most of them declared to have an optimistic attitude towards COVID-19 control, showing a percentage of 92.1% (n=350) for students, 94.9% (n=37) for medical workers, and 92.3% (n=83) for other occupations group. **Table 3** displays the attitude towards COVID-19 of participants by group.

Table 2. Knowledge and awareness about COVID-19 of participants by occupation group

	Students (n, %)	Medical workers (n, %)	Other occupations (n, %)	*P*
Have you heard about COVID-19?				
Yes	376(99.0)	39(100)	88(98.9)	1
No	4(1.0)	0(0)	1(1.1)	
When did you hear about COVID-19?				
Dec.,2019	155(40.8)	18(46.2)	30(33.7)	0.7163
Jan.1-20,2020	188(49.5)	17(43.6)	47(52.8)	
Jan.21-23,2020	31(8.2)	4(10.3)	10(11.2)	
Jan.24,2020 and after	6(1.6)	0(0)	2(2.3)	
Do you know that COVID-19 has been declared to be a PHEIC?				
Yes	319(89.0)	38(97.4)	78(87.6)	0.0613
No	61(16.1)	1(2.6)	11(12.4)	
Do you agree that COVID-19 is the same as Influenza virus?				
Yes	59(15.5)	0(0)	12(14.0)	0.0285
No	321(84.5)	39(100)	77(86.0)	
Do you agree that COVID-19 is the same as SARS?				
Yes	61(16.1)	2(5.1)	13(14.6)	0.1893
No	319(84.0)	37(94.9)	76(85.4)	
Do you agree that influenza vaccine can prevent COVID-19?				
Yes	33(8.7)	1(2.6)	7(7.9)	0.4083
No	345(91.3)	38(97.4)	82(92.1)	
Which level is the category and treatment of COVID-19 classified in China?				
Class B infectious disease and treated as Class A	189(49.7)	33(84.6)	34(38.2)	<.0001
Others	191(50.3)	6(15.4)	55(61.8)	
What is the possible host for COVID-19				
Wildlife(eg.bat)	375(98.7)	39(100)	85(95.6)	0.0924
Others	5(1.3)	0(0)	4(4.4)	
Which population group is susceptible to COVID-19?				
Middle-aged and elderly	169(44.5)	7(18.0)	37(41.6)	0.0241
Elderly and children	62(16.3)	6(15.4)	14(15.7)	
All ages	141(37.1)	26(66.7)	36(40.4)	
Young adults	8(2.1)	0(0)	2(2.2)	

How long is the incubation period of COVID-19?				
1-14 days	332(87.4)	36(92.3)	77(86.5)	0.6343
Others	48(12.6)	3(7.7)	12(13.5)	
Do you think that COVID-19 is contagious during the incubation period?				
Yes	374(98.4)	39(100)	89(100)	0.753
No	6(1.6)	0(0)	0(0)	
Is there any effective treatment for COVID-19?				
Available	55(14.5)	1(2.6)	6(6.7)	0.0214
Unavailable	325(85.5)	38(97.4)	83(93.3)	
When do you think that it is necessary to wear a mask during COVID-19 pandemic?				
When going outside	344(90.5)	34(87.2)	76(85.4)	0.3307

Table 3. Attitude towards COVID-19 of participants by occupation group

	Students (n, %)	**Medical workers (n, %)**	**Other occupations (n, %)**	***P***
How concerned are you about COVID-19?				
I don't care	1(0.3)	0(0)	0(0)	0.0015
Low concern	56(14.7)	2(5.1)	7(7.9)	
Medium concern	174(45.8)	9(23.1)	36(39.3)	
High concern	149(39.2)	28(71.8)	47(52.8)	
How often do you check updates about COVID-19?				
More than once per day	104(27.4)	19(48.7)	33(37.1)	0.0072
once per day	183(48.2)	18(46.2)	41(46.1)	
Less than once per day	93(24.5)	2(5.1)	15(16.8)	
What impact does the village/city lockdown policy have on your daily life?				
Minimal	59(15.5)	8(20.5)	17(19.1)	0.2739
Moderate	111(29.2)	14(35.9)	33(37.1)	
Significant	210(55.3)	17(43.6)	39(43.8)	
What is your attitude towards the control of COVID-19 pandemic?				
Optimistic	350(92.1)	37(94.9)	83(92.3)	1
Neutral	9(2.4)	0(0)	2(3.3)	
Pessimistic	21(5.5)	2(5.1)	4(4.5)	
Do you think COVID-19 could be a global outbreak?				
Yes	109(28.7)	8(20.5)	27(30.3)	0.5033
No	271(71.3)	31(79.5)	62(69.7)	

Discussion

The present study determined the knowledge, awareness, and attitude towards COVID-19 among students, medical workers, and other occupations based on a web platform during the critical period of the outbreak. It demonstrated that participants from different population groups had similar knowledge and awareness towards

COVID-19. However, a significant better performance of medical workers was observed regarding professional knowledge. It was confirmed that the lockdown policy imposed a substantial impact on daily life of the analyzed groups. Nevertheless, most of the participants believed that COVID-19 would not be a global outbreak and they hold an optimistic attitude towards the control of COVID-19 pandemic.

In the present research, 314 respondents were excluded from the analysis due to failure on the control items confirmation. Of 314 unqualified participants, students accounted for 77.4%(n=226), followed by 17.5% (n=51) for other occupations and 5.1% (n=15) for medical workers. No significant differences were found when compared with the occupation distribution between qualified and unqualified groups. However, the mean age of unqualified group was significantly lower than that in the qualified group because of the high proportion of students. Meanwhile, the distribution of ethnicity and marriage status also had no statistical significance between the two groups. Thus, it can be inferred that the representative of the qualified group was accepted because minimal bias was caused on the unqualified population excluded.

Our study revealed that most of the participants heard about COVID-19, and a higher proportion of them had heard it by January, which corresponded with other studies that found that the peak of information searching about COVID-19 was by the end of January in various countries [11,12]. It is worth noting that certain proportion of medical workers and students heard about the virus by the end of December 2019.

Regarding the general knowledge of COVID-19, our findings showed that almost all participants knew that the host of the virus was probably related to wildlife animals. In addition, most of the participants knew that COVID-19 was different from influenza and SARS, and also had correct ideas about the incubation time of COVID-19, and the most susceptible populations. Meanwhile, medical workers showed a more advance knowledge in professional questions than the other two groups. Compared with another similar study conducted in India, the level of knowledge and awareness among the participants in our study is higher because most of the responders in India were passably aware of the basic elements of the disease [13]. Meanwhile, similar findings were reported in another study performed in China that demonstrated that most of the participants were knowledgeable about COVID-19 [14].

Participants of this study used social media platform (e.g. Sina Weibo) most often to obtain information about COVID-19, as well as other applications (WeChat, and QQ). Traditional media such as newspapers and

magazines, were less used to get updates. Similar findings were found in other studies that analyzed the sources where people searched for information about COVID-19 [15-17]. The possible explanation could be that social media applications have become popular and easily accessible compared with traditional media sources, thus speeding the spread of information.

Regarding preventive measures, our study found that most of the participants would wear a mask when going outside and in crowded places. However, there is controversial information about the effectiveness of wearing mask for the general population [18]. In East Asia, especially in China, wearing mask has been one of the main preventive measures recommended by the government since the beginning of the outbreak. This was possibly one of the main differences with other places in the world where the use of masks was not compulsory for the general population [19]. In fact, wearing a mask has contributed much to the effective control of COVID-19 in China. Furthermore, a wide range of countries and regions recommended their citizens wear a mask if social distance could not be ensured.

Most of the study participants reported that they were highly concerned about COVID-19, especially medical workers. Similarly, another web-based study conducted in China suggested that 97.1% of participants paid close attention to COVID-19 by checking updates more than once per day [20]. A possible reason for the frequent update checking was associated with the pandemic that put virtual psychological stress on the public. Another study in China also showed that more than 90% of the study population experienced concern and stress [21]. The high concern of medical workers could be related with a higher risk of exposure to COVID-19 and their fear of getting infected. A similar study performed in Henan, China, demonstrated that 85% of healthcare workers were afraid of being infected at work [22].

The lockdown policy has been an important preventive measure to deter the spread of COVID-19 pandemic in several countries [23,24], and it has been effective in China [25]. In our study, most of the respondents reported that the lockdown policy had a significant impact on their daily life. In this regard, other studies also confirmed that lockdown measures can have a substantial impact on the mental health of the population and affect their daily lives due to less physical activity and social distancing [26]. Moreover, another research that reviewed the impact of COVID-19 on university students showed that most of the learners were concerned about the effects that the outbreak would have on their academic performance. Since most of the universities

had been closed and classes were online [27], this may be an explanation to why students considered the impact of lockdown as significant. Nevertheless, as a positive outcome, the lockdown policy also provided an opportunity and the time for families to stay close, especially if they learned to cope with tensions that occurred due to changes in the family life routine. However, several countries, including China, reported an increase trend of domestic violence during the social isolation [28], and it raised a general concern about parenting during the lockdown and how families can deal with the stress of the crisis [29].

Despite being highly concerned about COVID-19, more than 90% of the respondents declared to have an overall optimistic attitude towards COVID-19 control. Similar findings were reported in another cross-sectional web-based study among healthcare workers globally, especially in Asia, where 78% of the participants held a positive perception of COVID-19 [30]. In contrast, a study performed in Uganda showed that only 21% of the participants had a good attitude towards the disease [31]. A possible cause of differences in the attitude towards COVID-19 pandemic, may be the social and economic gap among countries, which might influence the availability of medical services that participants can get and the sanitary conditions in their houses and work. The Human Development Index (HDI) might be an adequate measurement of this gap. In Asia the HDI ranges from 0.647 to 0.866, while in Uganda it is 0.528. Similarly, more than half of the responders declared that COVID-19 could not become a global outbreak. This trend might be related to the low international incidence of cases when the survey was conducted.

The current study evaluated the knowledge, awareness, and attitude towards COVID-19 among different populations in Central China providing meaningful findings that might be useful for other countries and regions facing COVID-19 pandemic. Nevertheless, limitations still exist. Firstly, the sample size was small and unbalanced, especially for medical workers and other occupations group, which might limit the generalization of findings. Therefore, the interpretation of the results should be cautious. Secondly, the findings related to mental health were not included in the current analysis. Finally, the sample representing the target population could be limited to some extent because all of participants came from the same geographical region.

Conclusions

In general, the findings show that the participants have an adequate background knowledge about COVID-19 and hold an optimistic attitude towards the control of the disease. However, most of the participants were highly concerned about the pandemic and declared that the lockdown policy had a significant impact on their daily life which warrants the necessity to implement effective preventive measures to relief emotional and psychological stress. Finally, this research offers essential evidence for COVID-19 pandemic control before the availability of the prophylactic vaccine. Further studies are still needed to identify the specific impact that COVID-19 pandemic had on the lives and on the mental health of the population.

Conflict of Interest

All authors confirmed that no conflict of Interest disclose.

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Supplementary Files

Figures

Ways to obtain COVID-19 information by occupation group?.