Original Article

Anxiety, attitudes, and behavioural practices of COVID-19 among foreign students in Nanjing

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Background: COVID-19 pandemic has caused many uncertainties and delays in education, leading to psychological impacts on students. This study aimed to assess anxiety, attitudes, and behavioural practices associated with COVID-19 among foreign students in Nanjing, China, and explore its effects on foreign students and their response to this pandemic.

Methods: A cross-sectional survey was conducted from 1st to 20th August 2020 among foreign students living in Nanjing, China. A total of 304 participated through an online self-administered questionnaire. Each answer for attitude and behaviors were scored 1 or 0. Percentages of scores were then classified as a positive attitude or low-risk practice (>80%), moderate attitude or moderate-risk practice (60.01–80%), and negative attitude or high-risk practice (≤60%). GAD-7 was used to assess anxiety levels where scores of 5, 10, and 15 were taken as mild, moderate, and severe anxiety, respectively. The data collected were analyzed by SPSS version 23.

Results: The mean attitude percentage ranged from 71.21–80.50%, whereas the mean behavioral percentage ranged from 69.47–77.29% across the socio-demographic characteristics. Education level had a significant association (P=0.02) with students' attitudes. Most of the respondents reported avoiding crowded places (87.8%), 82.2% practiced social distancing, 74.7% avoided handshaking, and 52.9% wore masks when outside. Most of the students reported mild to moderate symptoms of anxiety. Gender had a significant association (P=0.02) with anxiety.

Conclusions: This study's outcome may enhance the understanding of the need for health education and adequate counselling to improve foreign students' knowledge and acceptable practices in controlling the spread of COVID-19.

Keywords: COVID-19; anxiety; attitudes; behavioral practices; China

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Introduction

The World Health Organization (WHO) declared COVID-19 a Public Health Emergency of International Concern (PHEIC) on 30th January 2020 (1). As of 8th November 2021, there were 249,743,428 confirmed cases and 5,047,652 deaths worldwide (2). The COVID-19 pandemic has had an eminent psychological and emotional impact. Its emergence and spread have created evident concern to people leading to increased depression, anxiety, and stress (3). Furthermore, the continuous spread of the pandemic has put educational systems in unprecedented difficult situations because of the strict isolation measures and delays in starting schools, colleges, and universities. This has affected the mental well-being of students (4,5).

Prevention measures taken by countries have varied. In China, relentless public health education programs, using internet messages, multimedia reports and broadcasting, as well as e-hospital consultations, and virtual classes have been implemented to enhance public readiness (6,7). It has been observed that people display awareness of protective behaviors against diseases and develop health-protective attitudes during a health crisis, such as an outbreak. Prompt and accurate information plays a vital role in controlling the spread of disease and alleviating fear and uncertainty during an outbreak. In addition, community risk perception and illness-related anxiety have an impact on the prevention behaviors and measures taken. Knowing what to do helps people feel safer and enhances the belief that they are capable of taking meaningful protective measures (8,9).

Previous studies have shown foreign students to have various psychological issues just because of the social pressure and uncertainties of being in a foreign country, even before the pandemic had begun (10-12). With the current pandemic, the impact is ought to be dire. Previous studies have explored students' response to COVID-19 (13-15) but have not focused on foreign students. In addition, to our knowledge, no detailed study on the mental health status, perceptions, and behaviors of foreign students facing the epidemic in Nanjing has been conducted. Therefore, we conducted this cross-sectional survey of attitudes, anxiety, and behavioral practices associated with COVID-19 among foreign students in Nanjing, China, to explore the pandemic's effect on foreign students and their response to this pandemic. Understanding foreign students' response to the pandemic is vital in having inclusive efforts in the control of the ongoing COVID-19 pandemic. We present the following article in accordance with the SURGE reporting checklist (available at https://jphe.amegroups.com/article/view/10.21037/jphe-21-9/rc).

Methods

Study design

An internet-based cross-sectional survey was conducted from 1st August to 20th August 2020 among foreign students who were, by then, still living in Nanjing, China. It examined foreigners' attitudes, behavioral practices, and any potential anxiety levels during COVID-19 lockdown.

Study setting and population

Nanjing is the capital of Jiangsu province of the People's Republic of China and the second-largest city in Eastern China, known for a broad range of prestigious higher education and research institutions. Nanjing's major universities accepting foreigners are scattered around its 11 different districts. For this study, we categorized the districts into city proper (Gulou District, Xuanwu District, Qixia District, Qinhuai District, Yuhuatai District, Jianye District) and suburban (Jiangning District, Pukou District, Lishui District, Luhe District, Gaochun District). The survey was carried out among foreign students aged 15 years and older, living in Nanjing at the time of data collection.

Sample size

The study used a sample size of 304 participants. The calculated ideal sample size was 368, considering a 50% response rate, 95% confidence interval (CI) and 5% margin of error with a total estimated foreign students population of 8,322 from the various universities in Nanjing. However, this could not be achieved as many foreign students had left Nanjing upon graduation at the time of data collection.

Participant recruitment

Field investigation was not possible because of the COVID-19 preventive measures such as social distancing and restricted movement. The study respondents were students willing to participate and were sourced from various university student WeChat (a messaging and social media app) groups. A website wenjuan (http://www.wenjuan.com)

was used to create a detailed online questionnaire and was distributed through a link and QR code on the WeChat platform. We conducted a pilot study of 50 participants prior to the distribution of the questionnaire to test for its overall acceptability and reliability. The results of the pilot test were not included in the final analysis. The online survey was also distributed through individual friendship networks and different groups on WeChat. The questionnaire included a short description of the survey, and the confidentiality of participation was assured. The online questionnaire was configured such that only fully-answered questionnaires were allowed to be submitted.

Data collection

The assessment of the positive attitudes and low-risk practices were designed and developed based on the information available on the websites of the WHO, the CDC, and the European CDC (ECDC) (16-18). The questionnaire was divided into 4 parts: Part A of the questionnaire included information on socio-demographic characteristics such as age, gender, location of the school, marital status, level of education and place of residence. Part B included 8 yes/no questions about attitudes toward COVID-19. Part C of the questionnaire assessed the COVID-19 preventive behavioral practices, including observing social distancing and good hygiene practices, which were also evaluated using 12 yes/no questions.

The last part of the questionnaire assessed anxiety levels using the 7-item Generalized Anxiety Disorder Scale (GAD-7). The GAD-7 asks participants if they had anxiety symptoms in the past 2 weeks. Items are rated from 0 (not at all) to 3 (nearly every day), indicating symptom frequency. GAD-7 scores of 5, 10, and 15 are considered as the cut-offs of mild, moderate, and severe anxiety, respectively (19).

Ethical considerations

An informed consent form detailing the voluntary participation and notifying participants that they could withdraw from the survey at any point was included on the first page of the online questionnaire. The study did not collect any respondents' identifying information. In addition, the study was approved by the research ethics committee of Southeast University, Nanjing, China. Overall, the study was conducted in accordance with the Declaration of Helsinki (as revised in 2013).

Statistical analysis

The data collected were analyzed using the Statistical Package for Social Sciences (SPSS) version 23. Categorical variables were analyzed using Pearson's chi-square (χ^2) test to investigate the difference between socio-demographic characteristics of the students. A P value <0.05 was considered statistically significant. The collected data were entered and coded in Microsoft Excel. Simple descriptive statistics were produced for all variables, and a scoring system was adopted to assess the students' attitude and behavioral practice toward COVID-19. Each answer reflecting a positive attitude or low-risk practice scored 1 point, while a negative attitude or high-risk practice was scored 0. The total attitude or practice score was calculated and converted to percentages. Afterwards, attitudes or practices were then categorized as follows: negative attitude or high-risk practice (≤60% of the total score), moderate attitude or moderate-risk practice (60.01–80% of the total score), and positive attitude or low-risk practice (>80% of the total score). These cutoffs were adapted from previous similar studies (13,14).

Results

The study had a total of 304 participants; of these, 68.1% were male, and 31.9% were female, and 93.7% were below 35 years of age. The majority of the participants were single (82.6%), 70.7% lived in city proper, and 81.3% of the respondents lived in dormitories. According to the education level, most participants were masters' students (43.7%), as shown in *Table 1*.

Attitudes of students' towards COVID-19

The analysis showed that the mean attitude percentage ranged from 71.21–80.50% among socio-demographic characteristics. The participants aged 25 to 34 years had a larger proportion of positive attitudes (37.8%) compared to the other age groups. The proportion of male respondents (28.3%) who had a positive attitude was larger than that of females. The proportion of positive attitudes varied according to the school's location, with residents of city proper having 37.2%. Single respondents had a larger proportion of positive attitudes (43.1%) as well as masters' students (24.0%). Notably, there was a significant difference among education levels regarding attitudes towards COVID-19 (P=0.02). Students who lived in dormitories had

Table 1 Foreign students' attitudes towards COVID-19

Demographic variable	N (%)	Attitude category, N (%)			Mean attitude (%)	SD	χ^2	P value
		Positive	Moderate	Negative				
Overall	304	152 (50.0)	124 (40.8)	28 (9.2)				
Age (years)							8.82	0.06
15–24	74 (24.3)	32 (10.5)	32 (10.5)	10 (3.3)	75.85	16.85		
25–34	211 (69.4)	115 (37.8)	81 (26.6)	15 (4.9)	80.21	15.56		
35 and above	19 (6.2)	5 (1.6)	11 (3.6)	3 (1.0)	71.71	18.09		
Gender							0.42	0.81
Female	97 (31.9)	51 (16.8)	38 (12.5)	8 (2.6)	79.64	16.07		
Male	207 (68.1)	101 (28.3)	86 (28.3)	20 (6.6)	78.14	16.27		
School location							2.23	0.33
City proper	215 (70.7)	113 (37.2)	82 (27.0)	20 (6.6)	79.77	15.91		
Suburban	89 (29.3)	39 (12.8)	42 (13.8)	8 (2.6)	75.84	16.62		
Marital status							5.31	0.07
Single	251 (82.6)	131 (43.1)	95 (31.3)	25 (8.2)	78.74	16.63		
Married	53 (17.4)	21 (6.9)	29 (9.5)	3 (1.0)	78.07	14.06		
Education level							15.60	0.02
Bachelors	86 (28.3)	37 (12.2)	37 (12.2)	12 (3.9)	75.87	17.34		
Masters	133 (43.7)	73 (24.0)	48 (15.8)	12 (3.9)	79.89	15.98		
Doctoral	75 (24.7)	38 (12.5)	36 (11.8)	1 (0.3)	80.50	13.03		
Others	10 (3.3)	4 (1.3)	3 (1.0)	3 (1.0)	71.25	25.72		
Residence							0.82	0.66
Dormitory	247 (81.3)	125 (41.1)	101 (33.2)	21 (6.9)	78.69	16.48		
Apartment	57 (18.7)	27 (8.9)	23 (7.6)	7 (2.3)	78.29	15.04		

N, total count; SD, standard deviation; χ^2, chi-square.

larger proportions of positive attitudes (41.1%) than those in apartments (*Table 1*).

Regarding the eight questions on students' attitudes, 90.5% of the students thought that COVID-19 is a dangerous disease, and 89.8% were interested in knowing the methods of prevention of the disease. Those who believed that COVID-19 could be reduced by self-isolation were 89.5%, 95.4% believed that the illness can be reduced by awareness, and 92.8% thought wearing a mask is necessary. Out of the respondents, 78% believed that travel restriction was still necessary, and 55.6% of the students thought the information about COVID-19 is not sufficient. However, only 48.7% believed that they are vulnerable to COVID-19 infection (*Table 2*).

Students' behavioral practices towards COVID-19

The mean behavioral percentage ranged between 69.47–77.29% across the demographic variables. Among the study participants, those of 25–34 years of age had a greater proportion of low-risk practices (30.3%), as well as male respondents (25.7%). Students living in city proper had a larger proportion of low-risk practices (30.3%) than those in the suburban. The single respondents had a larger proportion of low-risk behavior compared to their married counterparts. The proportion of low-risk practices also

Table 2 Responses about attitudes towards COVID-19

Questions (positive attitude)	Positive attitude, N (%)	Negative attitude, N (%)
COVID-19 is a dangerous disease (yes)	275 (90.5)	29 (9.5)
You are vulnerable to COVID-19 infection (yes)	148 (48.7)	156 (51.3)
Interested in knowing the methods of prevention of COVID-19 (yes)	273 (89.8)	31 (10.2)
COVID-19 can be reduced by self-isolation (yes)	272 (89.5)	32 (10.5)
COVID-19 can be reduced by awareness (yes)	290 (95.4)	14 (4.6)
Wearing a mask is necessary (yes)	282 (92.8)	22 (7.2)
Restriction of movement/travel is still necessary (yes)	237 (78.0)	67 (22.0)
Available information about COVID-19 is sufficient (no)	169 (55.6)	135 (44.4)

varied with education level, where master's students showed a bigger proportion (18.8%). Moreover, dormitory students (32.2%) also had larger proportions of low-risk practices than those who lived in apartments (*Table 3*).

Regarding questions about students' behavioral practices, 83.9% of the respondents reported covering their nose with a tissue when coughing, and 88.2% threw away used tissue into a bin directly after use. Regarding when to wash hands, 70.7% washed after using the toilet, 65.8% after touching personal items of people with cough, 44% before touching their eyes and nose, 55% after shaking hands with others, 71.4% after touching common contact surfaces, 72.7% before eating and 84.9% washed their hands when they return to their rooms (*Table 4*).

The majority of the respondents (77%) reported washing their hands with soap and water, while 21% used hand sanitizers or gel. Only 38% washed their hands for more than 20 seconds, and 68.1% often engaged in physical exercise. Most of the respondents (52.9%) reported using face masks when outside their room, 87.8% avoided crowded places to protect themselves from COVID-19, 82.2% practiced social distancing, and 74.7% avoided hand-shaking. A large number of respondents would avoid contact with people if they had flu symptoms (87.2%), and 92.8% would seek medical advice if they experienced COVID-19 symptoms (*Table 4*).

Students' anxiety levels

Generally, most of the students reported mild to moderate symptoms of anxiety (92.7%), and few had severe symptoms (7.2%). For the demographic characteristics, only gender was found to have a significant difference (P=0.02), where male students reported more severe anxiety (4.9%) compared to female students (2.3%). Among the age groups, students aged 25 to 34 years were found to have more severe levels of anxiety (4.9%) compared to others. Students living in city proper reported severe anxiety levels (4.9%) compared to those living in suburban districts (2.3%). Severe anxiety was also noticed more among single participants (6.3%), bachelor students (3.0%), as well as international students living in the dormitories (6.3%), as shown in (*Table 5*).

Discussion

This survey explored different attitudes, behavioral practices, and anxiety levels of foreign students in Nanjing during the current COVID-19 pandemic. We found that most respondents had good attitudes, behavioral practices, mild to moderate anxiety levels, and only a few had severe anxiety.

In general, over 90% of the students had good attitudes towards social distancing, restricted movement, wearing masks, and maintaining hygiene. The success story of controlling the virus in China has encouraged people to believe that the measures taken by the government are good and developed a sense of good attitude regarding social distancing and the importance of masks during the pandemic (20). Our study found that students aged 25–34 had better attitudes compared to other age groups. These findings are similar to a previous study where age groups above 25 and below 40 showed a good attitude towards the COVID-19 pandemic (21). This could be because this age group is intrinsically more flexible and exploratory, good at receiving information, and has a sense of open-mindedness to receive new information

Table 3 Behavioral practices among foreign students in Nanjing

Demographic variable	N (%)	Behavioral practices, N (%)			Mean practices (%)	SD	χ^2	P value
		Low-risk	Moderate-risk	High-risk				
Overall	304							
Age (years)							4.72	0.32
15–24	74 (24.3)	24 (7.9)	32 (10.5)	18 (5.9)	72.40	14.65		
25–34	211 (69.4)	92 (30.3)	80 (26.3)	39 (12.8)	75.51	15.60		
35 and above	19 (6.3)	7 (2.3)	10 (3.3)	2 (0.7)	77.29	13.48		
Gender							2.08	0.35
Female	97 (31.9)	45 (14.8)	35 (11.5)	17 (5.6)	75.75	14.56		
Male	207 (68.1)	78 (25.7)	87 (28.6)	42 (13.8)	74.45	15.61		
School location							2.68	0.26
City proper	215 (70.7)	92 (30.3)	80 (26.3)	43 (14.1)	75.10	15.43		
Suburban	89 (29.3)	31 (10.2)	42 (13.8)	16 (5.3)	74.28	14.96		
Marital status							0.03	0.98
Single	251 (82.6)	101 (33.2)	101 (33.2)	49 (16.1)	74.57	15.42		
Married	53 (17.4)	22 (7.2)	21 (6.9)	10 (3.3)	76.27	14.62		
Education level							4.51	0.61
Bachelors	86 (28.3)	28 (9.2)	36 (11.8)	22 (7.2)	72.83	15.17		
Masters	133 (43.7)	57 (18.8)	53 (17.4)	23 (7.6)	74.51	15.08		
Doctoral	75 (24.7)	34 (11.2)	29 (9.5)	12 (3.9)	76.77	14.79		
Others	10 (3.3)	4 (1.3)	4 (1.3)	2 (0.7)	69.47	20.87		
Residence							0.67	0.71
Dormitory	247 (81.3)	98 (32.2)	99 (32.6)	50 (16.4)	74.41	15.54		
Apartment	57 (18.7)	25 (8.2)	23 (7.6)	9 (3.0)	76.82	14.00		

N, total count; SD, standard deviation; χ^2, chi-square.

(22,23). This study also showed a significant difference in attitude patterns across education levels where masters and doctoral students had a better attitude compared to undergraduates and others. This could be attributed to the fact that postgraduate students tend to have more interest in research, contributing to the accumulation of knowledge, understanding of new issues, and their prevention and control. Education level has been reported to affect attitude towards COVID-19 in other COVID-19 studies (24,25). However, this study showed that only 55% of foreign students think the available information about COVID-19 is sufficient. Most of the information regarding the pandemic in China is often conveyed in the Chinese language, which not all foreign students can easily understand, thus a need for prompt translation.

Generally, students reported low-risk practices with mean percentages ranging from 69.5–76.8% across all demographic variables. The results are similar to previous studies that reported low-risk practices towards COVID-19 among university students (13,14,26). Notably, Olaimat *et al.* and Barrett *et al.* reported higher percentages of low-risk practices (84.3% and 88.9% respectively) (13,26), and the possible difference could be explained by the time when the studies were conducted. The present study was conducted seven months down the COVID-19 pandemic when people have adjusted and restrictions being relaxed,

Table 4 Responses about practices towards COVID-19 among foreigners in Nanjing

Question item (low-risk practice)	Low-risk practice, N (%)	High-risk practice, N (%)
Cover your nose with a tissue when coughing and sneezing (yes)	255 (83.9)	49 (16.1)
Throw away the used tissue into the bin directly after use (yes)	268 (88.2)	36 (11.8)
Handwashing to prevent COVID-19		
a) Wash hands after toilet	215 (70.7)	89 (29.3)
b) Wash hands after touching the personal items of someone who has a cough and/or cold	200 (65.8)	104 (34.2)
c) Wash hands before touching eyes or nose	134 (44.1)	170 (55.9)
d) Wash hands after shaking hands with others	168 (55.3)	136 (44.7)
e) Wash hands after touching common contact surfaces such as doorknobs or elevator buttons	217 (71.4)	87 (28.6)
f) Wash hands before eating	221 (72.7)	83 (27.3)
g) Wash hands when you come back home/room	258 (84.9)	46 (15.1)
Items usually used to wash hands		
a) Water and soap	234 (77.0)	70 (23.0)
b) Hand sanitizer or hand gel	64 (21.0)	240 (79.0)
Follow recommended time spent when washing hands (more than 20 s)	118 (38.8)	186 (61.2)
Often exercise during this quarantine (yes)	207 (68.1)	97 (31.9)
Use a face mask when leaving your room (yes)	252 (82.9)	52 (17.1)
Avoid crowded places (yes)	267 (87.8)	37 (12.2)
Practice social distancing to protect (yes)	250 (82.2)	54 (17.8)
Avoid hand-shaking (yes)	227 (74.7)	77 (25.3)
Avoid contact with other people if you have flu symptoms (yes)	265 (87.2)	39 (12.8)
Seek medical advice in case of any symptoms of COVID-19? (yes)	282 (92.8)	22 (7.2)

thus the observed decrease in low-risk practices. Even though the students reported low-risk practices, high-risk practices still exist, just like in Barrett *et al.*'s study (26). These include inadequate use of face masks when outside their room and poor hand-washing after touching personal items of people with cough, before touching their eyes and nose, and after shaking hands with others or touching common-contact surfaces. This implies a need for continuous education and sensitization to maintain community vigilance and keep up the acceptable low-risk practices amidst the relaxed restrictive measures.

Furthermore, male participants aged 25–34 years reported lower risk practices, and this deviates from Zhong *et al.*, who reported considerable risk practices towards COVID-19 among young males compared to females (21). The difference could be due to the higher proportion of male respondents recruited in this study. It should be noted that the age group 25–34 years corresponds to postgraduate students, and it is not surprising that the study also found low-risk practices among master students compared to undergraduate students. Generally, undergraduate students tend to have less knowledge and responsibilities than postgraduate students; hence they are less likely to cautiously follow low-risk behavioral practices (13). Residence was also linked to behavioral practices towards COVID-19, where students living in city proper and dormitories reported higher proportions of low-risk practices. The findings are in line with Zhong *et al.*, who reported an association between residence and behavioral practices towards COVID-19 (21). It should be noted that different resident communities have different strictness and adherence to COVID-19 prevention measures, explaining

Table 5 Student anxiety levels according to GAD-7 score

Demographic variable	N (%)	Anxiety level, N (%)			χ^2	P value
		Mild	Moderate	Severe		
Overall	304	246 (80.9)	36 (11.8)	22 (7.2)		
Age (years)					3.09	0.54
15–24	74 (24.3)	56 (18.4)	11 (3.6)	7 (2.3)		
25–34	211 (69.4)	173 (56.9)	23 (7.6)	15 (4.9)		
35 and above	19 (6.3)	17 (5.6)	2 (0.7)	0 (0.0)		
Gender					8.27	0.02
Female	97 (31.8)	71 (23.4)	19 (6.3)	7 (2.3)		
Male	207 (68.1)	175 (57.6)	17 (5.6)	15 (4.9)		
School location					3.14	0.21
City proper	215 (70.7)	170 (55.9)	30 (9.9)	15 (4.9)		
Suburban	89 (29.3)	76 (25.0)	6 (2.0)	7 (2.3)		
Marital status					2.77	0.25
Single	251 (82.6)	199 (65.5)	33 (10.9)	19 (6.3)		
Married	53 (17.4)	47 (15.5)	3 (1.0)	3 (1.0)		
Education level					4.50	0.61
Bachelors	86 (28.3)	65 (21.4)	12 (3.9)	9 (3.0)		
Masters	133 (43.7)	111 (36.5)	15 (4.9)	7 (2.3)		
Doctoral	75 (24.7)	63 (20.4)	7 (2.3)	6 (2.0)		
Others	10 (3.3)	8 (2.6)	2 (0.7)	0 (0.0)		
Residence					1.33	0.51
Dormitory	247 (81.3)	201 (66.1)	27 (8.9)	19 (6.3)		
Apartment	57 (18.7)	45 (14.8)	9 (3.0)	3 (1.0)		

N, total count; χ^2, chi-square; GAD-7, 7-item generalized anxiety disorder scale.

the bigger proportion of low-risk practices among city proper and dormitory students.

Majority of the students in this study reported mild to moderate symptoms of anxiety. The respondents' anxiety might be a result of the uncertainty of switching to online education, working from home, restricted movements, and social distancing measures taken across the country. In this study, male students reported higher levels of anxiety compared to female students. This finding contrasts with other previous studies that show no significant differences according to gender (4,27) and those that reported females having more anxiety than males (15). Notably, studies that showed no anxiety difference by gender (4,27) were conducted in the earlier stages of the pandemic with less severe mental health impact. The larger number of male participants in the current study could explain why males had more anxiety as opposed to other studies (15). We also found higher levels of anxiety among younger age groups; this is in line with previous studies which reported that young people may have more anxiety due to their greater access to information through social media, leading to stress (3,27). In addition, some students' research projects and internships were ceased contributing to more stress (28). The academic delays could have long-term impacts on students' psychological health as they are more likely to graduate later than they had expected, thus affecting their current studies and future employment (29,30). Furthermore, these delays in academic activities have been shown to contribute to various adverse effects on mental health,

especially among young people (4,31).

Moreover, we also found higher anxiety levels among bachelor students; this could be because postgraduate students tend to have better stress coping strategies compared to the younger undergraduate students. This finding is in line with other studies that showed a significant difference in anxiety levels among different levels of education (15,32). International students living in the dormitories reported higher levels of anxiety; this is most likely because of the more stringent and prolonged restrictions of movement initiated by the respective universities. Not surprising that single students, who most likely reside in dormitories also had higher levels of anxiety; this, in addition, could probably be due to loneliness during the lockdown, which has been shown to increase anxiety (4).

Limitations

The small sample size used in this study could limit the representativeness of the study results. More so, information on some key variables such as nationality and religion was not considered, which could affect the interpretation of study results. In addition, it being an online cross-sectional study, there is a possibility of responder bias and the study could not establish whether anxiety existed before the pandemic.

Conclusions

Our study found that most foreign students had a good attitude and behavioral practices during the current COVID-19 pandemic. Students aged between 25–34 years and postgraduate students showed a more positive attitude towards COVID-19. However, only 55% of foreign students think the available information about the disease is sufficient. Although a considerable number of students reported low-risk practices, high-risk practices still exist. In addition, male students in this study reported higher levels of anxiety compared to female students. The results of this study could aid the development of adequate counselling to manage anxiety as well as better and considerate dissemination of health information to enhance the knowledge and good practices of foreign university students.

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Footnote

Reporting Checklist: The authors have completed the SURGE reporting checklist. Available at https://jphe.amegroups.com/article/view/10.21037/jphe-21-9/rc

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