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Psychological experience of university students during prolonged quarantine in China: a qualitative study

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ABSTRACT

Objective To explore the psychological experiences of university students in prolonged quarantine during the COVID-19 pandemic.

Design A qualitative descriptive study based on semistructured interviews; data were analysed using a thematic topic analysis approach.

Setting Interviews were conducted via WeChat video.

Participants 20 full-time undergraduate students from seven districts in Shanghai Province who experienced prolonged quarantine were interviewed from June to August 2022.

Results The data analysis revealed three themes with corresponding subthemes related to the psychological experiences of university students during prolonged quarantine: (1) dynamic and complex psychological experiences, encompassing the feelings of relief, confusion, anxiety, insecurity, loneliness, craving for catharsis and emotional numbness; (2) desire for diverse support; and (3) self-reflection and growth, mainly including learning to be grateful, self-efficacy enhancement, reconsideration of the meaning of life and restructuring of future planning.

Conclusion This study explored the psychological experiences of university students in prolonged quarantine through qualitative interviews, which contributed to our understanding of their emotions, needs and conceptual changes during quarantine. Combined with the experiences of university students in quarantine, they reported complex emotional changes and diverse needs, as well as the impact of prolonged quarantine on their outlook on life. These findings can serve as a reference and basis for the development of future psychological intervention measures in line with national conditions.

INTRODUCTION

Due to the rapid spread of COVID-19 in March 2022 and the severity of the epidemic, authorities decided to implement 'city-wide static management' on 1 April in Shanghai. The residents of Shanghai were quarantined for 60–70 days (depending on the area) until 1 June, when work was comprehensively resumed and the average production was restored. Shanghai already has one of the longest duration of quarantine in China during the pandemic.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ This is the first qualitative descriptive study that has explored the psychological experiences of university students who experienced prolonged quarantine in China.

⇒ The qualitative descriptive design ensured an extensive and deep exploration of the university students' psychological experience during prolonged quarantine.

⇒ Semistructured individual interviews provided sufficient time for participants to recall and give detailed information about their psychological experience during the prolonged quarantine.

⇒ As the participants in this study were mainly from Shanghai, China, caution should be exercised when using the findings of this study in different regions.

⇒ This was a qualitative study; our sample size was limited because accessing eligible subjects during the pandemic was difficult.

Quarantine measures limit the movement of people who may be exposed to the virus, thereby reducing the infection rates.[1] Therefore, quarantine measures are vital for the prevention and control of epidemics.[2] However, the pandemic of COVID-19 and prolonged quarantine may have a significant psychological impact on individuals, leading to emotional disturbances, increased stress, anxiety and depression.[1] The generation of these emotions is mainly related to such things as social isolation, stigmatisation, occupational exposure to risk of disease, the collapse of social activities and whether to return to work. The risk of infection can also make individuals feel extra psychological pressure.[3][4]

University students are always considered a vulnerable group.[5] Due to unbalanced psychological development, elevated sensitivity, and academic and employment-related pressures, they are more likely to suffer from mental symptoms.[6] In previous studies, due to the COVID-19 pandemic, university students have experienced moderate to

severe depression (62.9%), anxiety (63.6%) and stress (58.6%),[7] and 2.7% of them suffered from post-traumatic stress disorder.[8] A study among health sciences students in home quarantine during the COVID-19 pandemic showed that the prevalence of anxiety and depression was 15.7% and 10.7%, respectively.[9] University students tend to be emotionally unstable and impulsive, and the incidence of risk behaviours tends to be higher.[10] In the face of stressful events such as long-term isolation, they may produce agitated behaviour, which may endanger their own and social safety. While it is common for people to experience a decline in psychological health after prolonged quarantine,[11] the ideas and demands of university students typically differ from the general population, as the university period is a particular stage of life. Thus, it is crucial to ascertain the psychological experience of university students, as it involves the psychological impact of prolonged quarantine on students, including their thoughts, attitudes, feelings, emotions, needs and changes.

The Chinese government issued a series of measures to make epidemic prevention and control more scientific and accurate. Notice on further optimising and implementing the prevention and control measures of COVID-19 includes the need to strengthen care and provide psychological counselling for quarantined personnel, patients and frontline medical workers.[12] The Ministry of Education of the People's Republic of China issued a circular on 25 March 2022,[13] stating that university students should strengthen their emotional self-adjustment during quarantine. Students need prompt help from family, friends and medical professionals, and should receive psychological help when they experience anxiety, confusion and other negative emotions. The Chinese government attaches high attention to the importance of psychological intervention for the quarantined groups, especially university students, and has raised measures for psychological intervention. However, a specific and targeted emergency response plan has not yet been available.

Through this study, we hope to explore the psychological experience of university students experiencing prolonged quarantine. Specifically, the research questions driving this study are: What emotional experiences do university students experience during prolonged quarantine?, What are the needs of university students during the prolonged quarantine? and How did their perceptions change during and after the prolonged quarantine? Thus, it provides a theoretical basis for formulating psychological intervention programmes in line with China's national conditions in the face of public health emergencies or inevitable prolonged quarantine in the future and, at the same time, providing a reference for the practical work of psychological health workers, community managers and university administrators.

METHODS

Design

A descriptive phenomenology method that included semistructured interviews was applied, as our main objective is to explore the psychological experience of university students who experienced prolonged quarantine. We employed the Consolidated Criteria for Reporting Qualitative Research checklist as a guideline.[14]

Participants

Based on the research objectives of this study, eligible participants had the following characteristics: (1) full-time undergraduate student, (2) living in Shanghai and quarantined for at least 2 months, and (3) provided informed consent and participated voluntarily in this study. Participants with the following characteristics were excluded: (1) non-university students and (2) those not in Shanghai during quarantine.

Recruitment

Participant recruitment was carried out at numerous universities in Shanghai. We used a purposive sampling and snowballing technique to select university students in Shanghai who underwent uninterrupted quarantine from March to June 2022 as study subjects.

Our study selected university students with different majors and grades to reach a wide range in age, major and enrolment year. First, two researchers introduced the project to potential participants through phone calls/WeChat videos. Researchers then contacted and scheduled interviews with interested participants. Participants were asked to help introduce more eligible students to the study. Researchers also obtained the contact details of other university students willing to participate in the study by contacting the student union. Researchers also posted information online to recruit a wider range of eligible subjects.

Two researchers familiar with the study plan conducted recruitment and subsequent interviews. Another author supervised these two researchers and ensured the rigour and accuracy of the recruitment, interview, data collection and analysis processes.

Following the principle of maximising the difference in purpose sampling, participants who could provide maximum information were selected as candidates according to the purpose of the study, and university students with different majors and grades were selected to achieve a wide range in age, major and year of enrolment. First, researchers contacted their former classmates and obtained the contact information of students' union members of some universities in Shanghai. Then, they introduced the project to them and invited students who met the inclusion criteria to participate in the study. Interviews were arranged with potential participants after contact and informed consent was obtained. After this, participants were asked to help refer more eligible students. In addition, researchers posted the recruitment information through WeChat groups to recruit more

Table 1 Demographic information of the participants (n=20)

Gender	Woman	10 (50%)
	Man	10 (50%)
Age (years)	19	3 (15%)
	20	4 (20%)
	21	6 (30%)
	22	7 (35%)
District of residence	Minhang District	4 (20%)
	Qingpu District	3 (15%)
	Baoshan District	2 (10%)
	Pudong New District	6 (30%)
	Jiading District	1 (5%)
	Yangpu District	2 (10%)
	Putuo District	2 (10%)
Specialty	Nursing	6 (30%)
	English	2 (10%)
	Rehabilitation medicine	4 (20%)
	Civil engineering	2 (10%)
	Chinese language and literature	2 (10%)
	Computer science and technology	2 (10%)
	Marketing	2 (10%)
Duration of quarantine (days)	60–69	13 (65%)
	≥70	7 (35%)

Box 1 Semistructured interview guide

Questions
1. How do you feel about the prolonged quarantine?
2. What is the impact of the prolonged quarantine on your life and study?
3. How do you cope with these changes during quarantine?
4. What kind of help do you need in this process?

eligible participants. Before the interview, participants were given a short questionnaire to collect their general information (including age, grade, major, district they live in and duration of quarantine). The recruitment of participants and the interviews were conducted by AY and MZ, who were familiar with the study. Another author, LL, supervised the two researchers and ensured the rigour and accuracy of the recruitment, interviews, data collection and analysis processes. Recruitment was stopped when data were saturated; no new information appeared in the last two interviews.

A total of 28 university students were invited to participate in this study; 20 agreed to participate (10 men and 10 women; median age: 20 (19–22) years). Of these, eight declined to participate, three explained that they had difficulty coping with negative emotions when recalling the quarantine experience and the others did not provide exact reasons for their refusal. The participants had been quarantined for over 2 months and had diverse professional backgrounds. Participant demographics are presented in table 1.

Data collection
We collected data from June to August 2022. Based on the purpose of the study, the researchers prepared a preliminary interview outline through a literature review and group discussion. Before the formal interviews, we conducted pre-interviews with two quarantined university students and revised the outline based on the interview content and expert recommendations (for final interview outline, see Box 1).

All interviews were conducted by AY and MZ, female graduate students in nursing who have been systematically trained in qualitative research and have mastered the semistructured interview method. In this study, researchers used WeChat video to conduct interviews and asked participants to choose a quiet, separate room as the interview venue; the participants chose the time of interview and were interviewed alone. The interviews lasted for 35–40 min and were video-recorded. The interviewer adjusted the serial order of interview questions according to the interview outline and the interviewee's mood. During the interview, the researcher listened carefully and recorded non-verbal behaviours. To ensure the authenticity of the interview data, we did not elicit or criticise interviewees' views. To ensure privacy, the interview results were presented anonymously; interviewees' names were replaced with 'P+number'.

Data analysis
After the interview, AY transcribed the audio into text within 24 hours of the interview completion and listened to it twice to ensure the accuracy of the transcription. During transcription, AY simultaneously watched the video recordings, paying close attention to changes in intonation and expression to analyse the interviewee's feelings more accurately. Transcriptions were returned to participants for correction.

This study used Colaizzi's data analysis method for data analysis,[15] so the analysis was data-driven rather than theory-driven. These steps include: (1) reading all interview materials carefully; (2) extracting significant statements related to the psychological experiences of university students during prolonged quarantine; (3) creating meanings for each significant statement; (4) organising common features or concepts of meaning to form themes, thematic groups and categories; (5) combining results into an exhaustive description of the psychological experience; (6) framing the exhaustive description into a statement of identification of its essential structure; (7) getting feedback on the result from the participants for confirmation to improve the validity of the data analysis. The above steps were repeated as necessary to ensure complete understanding of the statement and data saturation.

Two researchers independently analysed the data using a thematic analysis approach; disagreements were resolved through consultation with senior team members. Researchers initially encoded the interview data, and subsequently reviewed the data to identify similar phrases, emotions, experiences and values frequently stated, to identify common themes. We also assessed whether the participants accurately described the phenomenon and whether the researchers accurately described the meanings assigned by the participants to the phenomenon. This process was reviewed and re-examined by both the researchers and participants.[16]

Quality control

Before the interview, the researchers communicated properly with the participants through WeChat to establish trust. In the process of data collection and data analysis, the researchers suspended their personal views, immersed themselves in the text materials, read them repeatedly, and thought deeply about the real feelings and thoughts of the participants. AY and MZ jointly participated in transcribing and integrating the raw data. Then, they refined and integrated the transcribed textual information independently. Panel discussions resolved any disagreements. The researchers performed continuous iterative reflection during the collation and analysis to avoid misinterpreting the transcribed information. Interviewers also wrote reflection notes after each interview.

Patient and public involvement

During the recruitment phase of the study, the researchers invited some students to help invite potential participants. The manuscript was sent to all participants who provided their email addresses when the interviews were conducted.

RESULTS

The 20 participating college students lived in different areas of Shanghai during the implementation of 'citywide static management'. Their psychological experiences during the prolonged quarantine varied due to differences in residence area, age, life experience, educational experience and personal values.

Our data analysis revealed three themes and corresponding subthemes that characterised the psychological experience of the participants during the long-term quarantine. Table 2 shows the key information provided by the participants in the interviews; the researchers' interpretation has also been presented.

Theme 1: dynamic and complex psychological experience
Relief

Due to the quarantine, students took online courses at their homes or dorms, and those with internships experienced work interruptions. This eliminated commute time and provided them with more time for relaxation.

There was no commuting between home and school, I could save a lot of time… Being quarantined also allowed me to spend more time with my parents. (Participant 8)

Confusion

As the pandemic progressed, the number of infections peaked, resulting in the extension of quarantine. As a result, some participants felt overwhelmed, which may be related to the disrupted pace of their lives, increased academic pressure and family changes.

My parents went to take care of the elderly, leaving me alone at home, but I have never lived alone (frown). (Participant 2)

During quarantine, my mom was hospitalized after cancer surgery… But I was quarantined, and I did not know how she was going to take care of herself alone (wiping away tears). (Participant 6)

The quarantine affected the offline internship process for students pursuing professions such as nursing.

You know (sigh), what you learn in online internships is entirely different from that learnt with offline training. Now, I do not have access to patients at all and cannot even master the basic skills of my major. I am so confused about my future. (Participant 20)

Anxiety

The quarantine had a significant impact on both employment and academic pursuits, placing university students under pressure, and severely affecting their physical and psychological health.

I was already worried about finding a job. Now, it has become even more challenging. (Participant 15)

Moreover, online courses, despite their convenience, are sometimes considered ineffective. As a result, for some students, online courses do not allow them to achieve their learning goals, but instead, create anxiety and stress about their academic record.

I am distracted from lessons at home, but my classmates are studying hard. I feel really anxious because I wasted a lot of time. (Participant 11)

Even though we are taking online courses in the dormitory, there is still great pressure on me!… I have poor self-control, after a semester just like learning nothing. (Participant 7)

Insecurity

People's sense of security typically originates from certainty. With the continued presence of the epidemic, some students expressed their feelings of insecurity. This feeling came not only from sources around them (roommates as sources of infection), but also from unreasonable epidemic prevention measures.

Table 2 Examples of participants' responses

Themes	Subthemes	Extract	Authors' explanation	Participant
Dynamic and complex psychological experience	Confusion	'I was preparing for the nurse qualification certificate examination, but now I do not know when it will be postponed. Now I feel like I have suddenly lost my goal.'	Prolonged quarantine makes the daily routine and study habits of university students change dramatically in a short time, making them confused and overwhelmed.	P5
	Anxiety	'Examinations for public institutions I arranged have been postponed or canceled. Hospitals also delayed hiring and focus on epidemic prevention. How is it so difficult to find a job? (In an urgent voice)'	Senior students are facing employment. However, looking for a job has become difficult due to quarantine and preventive measures, resulting in anxiety among participants.	P2
Desire for diverse support		'I can only eat instant noodles and box lunch every day, which makes me feel sick… But it's nice to have something to eat, and I can't ask for more.'	Meeting students' basic needs has been a top priority due to shortages of supplies during the early quarantine period. Therefore, material support is essential for university students during quarantine, including daily necessities (such as toilet paper) and food.	P5
		'Some people on the internet say that cabbage sells for ¥100 each. I was not sure if it was true or not, anyway, and I felt very scared.'	False or negative information may spread widely during quarantine, disturbing university students' correct cognition of the current situation and aggravating their negative emotions. For example, participant 7 mentioned that he was afraid of price gouging, which also reflects the importance of information support.	P7
Self-reflection and growth	Learn to be grateful	'When I was an intern, teachers at the hospital were very responsible. When there was a red code person in the hospital (you are given a red code if you infect COVID-19, or come into contact with an infected person), they take immediate control measures. So I am especially grateful to the hospital and the community for their timely management.'	Participants received more or less help and support from others during the quarantine and expressed their gratitude for this. Participant 5 expressed gratitude to the intern hospital and the teachers, while participant 2 expressed gratitude to the neighbourhood care during the quarantine.	P5
		'As my neighbors knew that I lived alone, they often shared food supplies with me, which helped me a lot during the quarantine! In return, I would share handmade desserts (Smile).'		P2

Table 2 Continued

Themes	Subthemes	Extract	Authors' explanation	Participant
	Self-efficacy enhancement	'I used to be particularly scared or anxious when I saw negative news on the internet. But now I think that as long as we protect ourselves, 1 day we will overcome COVID-19.'	In addition to the negative impact of quarantine on university students, it was also likely to enable them to develop strong inner strength and achieve positive personal growth. After the prolonged quarantine, participant 13 showed positive and optimistic psychological qualities and became adept at using positive problem-solving strategies. Online courses give students great freedom, which may improve their learning ability for students with strong self-control (eg, participant 18). In addition, some participants claimed they could gradually complete housework independently during quarantine and gain growth.	P13
		'I think the online courses are great… I was able to time my studies better, and I became more disciplined than before.'		P18
		'Since I live alone, I have to do laundry and cooking by myself. So after being quarantined for such a long time, I can do housework very well now!'		P2

One of my roommates I jointly rent with, was back from the hospital; so I would avoid him when I left my room (to the living room, dining room, bathroom and other public space). Even after returning from the washroom, I had to disinfect myself. (Participant 19)

Although I was quarantined in the dormitory, everyone in the school took nucleic acid tests together on the playground. I am so afraid I might get infected because of this. (Participant 7)

Loneliness

The prolonged quarantine weakened the social network of university students, and they disengaged from their circle of friends. Although WeChat chats and other methods can help students keep in touch with their friends, it cannot replace the traditional communication methods. Therefore, university students were prone to loneliness during quarantine.

My friends would comfort me at first. But as the quarantine lengthened, they stopped listening to me. They had not experienced this (quarantine) and could not understand my feelings at all. (Participant 5)

Participants who were quarantined in the dormitory also expressed feelings of loneliness.

Although I lived in the dorm with my roommates, I still felt miserable. We were tired of looking at each other's faces every day, so we focused on our own business, which was no different from being quarantined alone. (Participant 7)

Craving for catharsis

University students in early adulthood are mentally immature and have weak self-control. Therefore, they may exhibit impulsive and risky behaviours when negative emotions become unbearable.

There was a time when I would shut myself up in my room. I could not stop crying, and I did not know what was wrong with me. (Participant 15)

In addition to self-harm, university students who have experienced prolonged quarantine have shown a tendency to harm others. One of our participants gradually developed an aversion to his roommate.

I hate my roommate more and more! It's really depressing being quarantined in such a crowded room with him every day. There is also the possibility of disease (COVID-19). I really want to beat him up sometimes… I am bored to death, but nothing can be done. (Participant 16)

Emotionally numb

In this study, due to the long-term effects of negative emotions, some participants claimed that as the quarantine period lengthened, they no longer expressed the strong emotions that they did at the beginning and began to feel emotionally numb. This sense of numbness may affect the individual's awareness of preventing and controlling infectious diseases and the ability to communicate with others.

At the beginning, we would disinfect the supplies with alcohol, even coming in from the community. However, the as the quarantine lengthened, I started caring less. (Participant 4)

Theme 2: desire for diverse support

Social support is an essential external resource for psychological health. In this study, participants expressed their

desire for diverse support. During the quarantine, daily necessities were in shortage. Some participants expressed a desire for support concerning supplies.

> We eat badly. Coke is a luxury for me. In the worst case, I do not even know if I will get my next meal. (Participant 7)

Information support is essential for quarantined students. False and negative information about the epidemic can not only severely interfere with the correct perception of the current state of the epidemic among students but also amplify their anxiety.

> There were various online messages about being released from quarantine, but many were fake. When the news came out that the quarantine would be released on 1 June, we were sceptical. I need accurate information! (frown) (Participant 4)

Emotional support may give students courage in the face of shortages of supplies and enormous psychological stress during prolonged quarantine.

> I wouldn't be so upset if my family members were there for me. (Participant 10)

Theme 3: self-reflection and growth
Learning to be grateful
During the quarantine, most participants were grateful for the care they received from the community and medical staff. Neighbourhood relations also improved during this time.

> I am touched and grateful to see that the whole country supports us, and the community volunteers are busy taking care of us. (Participant 12)

> I used to avoid my neighbours when I met them, but now we exchange supplies. It feels like our relationship has improved. (Participant 6)

Self-efficacy enhancement
The quarantine gave university students additional time and energy to reorder their lives. Moreover, it limited students' dependence on their families, making them actively learn life skills, which is conducive to enhancing their independence.

> The most significant achievement during the quarantine is that my cooking skills have improved, and the dishes I made were more delicious (smile). (Participant 9)

Some participants also reported an increase in emotional self-efficacy. They actively engaged in emotional self-regulation, paid attention to positive news, eliminated negative emotions and maintained a positive attitude.

> COVID-19 is a severe challenge to us, but I believe we will ultimately overcome the difficulties, and that nothing is impossible. (Participant 14)

Reconsideration of the meaning of life
The university students ranked their 'physical and psychological health' and 'family happiness' as the 'most valuable things in life', rather than 'making money'. The change in these concepts also means that they may have gained a deeper understanding of the connotation of self-worth and the meaning of life. It is possible that their experiences during the quarantine led them to respond in this manner.

> I used to think I had to do my best to earn money. But now, I believe nothing is more important than health. (Participant 9)

Restructuring of future plans
The prolonged quarantine also restructured the thinking and future plans of university students.

> Before this quarantine, I was preparing to study abroad, but now I think it is good enough to find a stable job near my home. (Participant 8)

> Now I am thinking about looking for a job closer to home. If my family members get sick or have an accident, I can accompany them instead of feeling panic. (Participant 9)

Since the outbreak of COVID-19, frontline medical workers caring for patients have had a great work mission, but have also been under tremendous psychological pressure, affecting medical students.

> I suddenly feel that my major is significant, so I will continue my clinical work in the future. (Participant 18)

> I think frontline health workers were exhausted from the epidemic prevention and quarantine… I absolutely can not handle the pressure! If I had the chance, I would change my major or career as soon as possible. (Participant 11)

DISCUSSION
To the best of the authors' knowledge, this study is the first qualitative study in China to explore the psychological experience of university students experiencing prolonged quarantine. Students experience dynamic and complex emotional changes with prolonged quarantine. However, due to the influence of negative emotions, lack of material supplies and uneven information quality, participants expressed a desire for diversified support. Finally, prolonged quarantine was a stressful event for university students, which greatly affected their outlook on life and career.

University students in prolonged quarantine experienced complex and diverse emotional changes
Lazarus' cognitive theory of emotion[17] believes that cognitive activities guide emotional activities, and individuals will produce different emotional responses by

continuously evaluating the relationship between the stimulus event and themselves (such as stakes, emotions and behavioural responses). Our study found that as the quarantine lengthened, the cognitive of university students shifted, and variations in stressors created multiple complex emotional experiences, both positive and negative. At the beginning of the quarantine, students' fast-paced lives are forced to slow down and the pressure of studying and interning is temporarily eased, creating a sense of relief.

The university phase is one of the most memorable phases of life. About half of all mental illnesses occur in the middle of adolescence,[18] and the incidence of psychological illness in university students has nearly doubled in the past decade.[19] Therefore, it is crucial to pay attention to the psychological well-being of university students, mainly when stressful events occur. However, a worrying observation in this study was that quarantined students experienced various degrees of negative emotions, such as confusion, anxiety, insecurity and loneliness, which is consistent with previous reports.[20–22] The main reasons for this phenomenon are the main reason for campus life being entirely changed, restricted activity, threats to health, etc.[5] In addition, our study found that one of the leading causes for negative emotions mentioned by the participants was the unprecedented pressure from study and recruitment. As a result of quarantine, students' learning method was changed from face-to-face to online. At the same time, Dost *et al*[23] pointed out that due to the lack of teacher preparation and technical difficulties, students rated online teaching as less effective and provided low learning efficiency. In addition, the prolonged quarantine affected the recruitment of work units, leading to the anxiety and worry of senior students about their careers, which is consistent with the research results of La Rosa and Commodari.[24] For subjects with higher practical requirements, such as medicine, halting clinical placements will undoubtedly impact their career development.[23] Students who experience negative emotions have worse academic performance, difficulty graduating and worse quality of life.[23] Valuable implications for educators can be assisting with employment and exploring ways to improve the effectiveness of online learning systems to alleviate negative emotions during and after the quarantine.

Another common emotion during quarantine is loneliness, which is caused by not having enough peer support or being isolated from the community or society.[25] The participants in this study also expressed different levels of loneliness. This sentiment may be addressed by increasing quarantined students' online social activities. A retrospective study showed that an individual in quarantine frequently worries about whether they would develop infection-related symptom.[1] This result was confirmed in our study, where nearly all participants experienced insecurity during quarantine and wondered if they had contracted the disease, despite being healthy. However, there was research[22] suggesting that only 5.3% of the sample thought that the probability of being infected with COVID-19 was high, and 72.3% expressed little or no concern about getting infection. This is likely to be mainly related to the policies of different countries. Due to China's strict quarantine policy, the emphasis on the severity of COVID-19 may lead to increased insecurity among those under quarantine. This is likely to be mainly related to the policies of different countries. Due to China's strict policy of quarantine, the emphasis on the severity of COVID-19 may lead to increased insecurity among those under quarantine. It may also be related to the fact that all the participants came from areas that were experiencing severe outbreaks.

It is also worrisome that participants expressed the desire for catharsis and emotional numbness after prolonged accumulation of negative emotions. Three participants reported an increasing desire for catharsis as the quarantine continued. The suicide intention of students who experienced quarantine during COVID-19 ranged from 12.3% to 18.04%,[5 26] which deserves high attention. In addition to harming themselves, a monotonous environment may lead students to try to alleviate boredom through aggressive behaviour.[27] Hsu and Tsai[28] found that quarantined Twitter users were more aggressive than those non-quarantined, and in the present study, participants even expressed the attempt to commit violent acts against their roommates, which could further jeopardise social stability. Preventive interventions are, therefore, essential to halting self-harm and injury events.

Moreover, some participants became emotionally numb after the prolonged quarantine, resulting in inadequate implementation of epidemic prevention measures. Mental health workers and university administrators should pay close attention to students with underlying mental illness as a precaution against the occurrence of self-injury and agitation. Once abnormalities or the possibility of aggressive behaviour is identified, timely psychological nursing intervention is required.

It is necessary to provide diversified support for university students to reduce their psychological pressure during quarantine

The provision of social support is essential to protect the psychological health of university students during prolonged quarantine. At the beginning of the quarantine, supplies were scarce due to insufficient workforce capacity, which led the quarantined students to request support concerning supplies. Additionally, the primary sources of information for university students are social media and the internet.[22] However, the information obtained from the internet is sometimes unreliable.[29] Public perception can be influenced by online social support.[30] When misinformation is widely disseminated, the public's risk perception is higher, which may predict higher levels of scare, anxiety and stress.[31] Receiving real, objective and scientific news predicts positive emotions,[31] which helps individuals understand risks, perceive the severity of public health emergencies correctly and take

effective actions to avoid risks. Thus, communities and governments should provide the right information to enable vulnerable groups, especially university students, to understand the current situation, risk perception and self-efficacy. This is a key prerequisite for controlling disease transmission through behavioural interventions and by reducing negative emotions.[32]

Prolonged quarantine also increased the degree of social isolation among university students. Son et al[33] reported that about 54% of students reported a significant decrease in interaction with others during the COVID-19, and about 31% expressed concern about the lack of face-to-face communication.[33] The support of friends and family was the most needed psychological resource for university students during quarantine, and they were willing to receive psychotherapy if necessary. There is evidence for the influential role of short-term social and emotional support in ameliorating negative emotions.[34] Therefore, by strengthening family contact and remote behavioural interventions, educators and psychological health workers can focus on the psychological health status of students, while providing basic psychological support and knowledge of psychological first aid.

Increase the positive psychological impact by guiding students towards establishing the correct outlook on life and career

While previous studies have detailed possible negative psychological sequelae, there are still potential positive psychological effects of COVID-19 and prolonged quarantine. Cohen-Louck suggests that the longer the quarantine, the higher the level of post-traumatic growth.[35] Stallard et al's research[36] also showed that 88.6% of the 341 respondents believed that COVID-19 and quarantine would bring positive effects, including more intimate family relationships and greater appreciation of life and others, which was consistent with the conclusions drawn in our study. Participants expressed gratitude to the community workers, medical personnel and neighbours because of the help they obtained during the quarantine, and also placed more emphasis on emotional connection with family members. As per Maslow, gratitude is crucial as a tool to cope with difficult situations.[37] By helping university students appreciate social resources, they can face the difficulties caused by prolonged quarantine and other situations in a more positive way.[38] In addition, participants also reported that the quarantine gave them additional time and energy to organise their lives, and their self-efficacy in emotion regulation was also enhanced. Numerous studies have shown that self-efficacy of emotions reduces the risk of anxiety, depression and other psychological problems,[39] and promotes the psychological well-being of university students during quarantine and other possible health crises.[40] Therefore, one of the essential goals of providing psychological nursing for university students during and after quarantine is to improve their emotional self-efficacy.[41] Mindfulness-based stress reduction interventions can

help students reduce anxiety and stress, and improve emotional self-efficacy.[41] Implementing mindfulness-based stress reduction interventions may be effective in helping students reduce negative emotions and improve their emotional self-efficacy.

In this study, the participants were no longer desperate for a decent job and large amounts of money, but regarded physical health and family relationships as the most valuable things. It is worth noting that the quarantine affected the future career planning of medical-related major students in two diametrically opposite ways in our study. Some saw it as their responsibility to devote themselves to preventing and controlling infectious diseases. However, healthcare workers are reported to be stigmatised by the public and face severe psychological and physical symptoms during quarantine.[42] Accordingly, some students may have wished to change their career goals. For university students in early adulthood (18–25 years old), the beginning of university study coincides with the transition stage of adulthood and independence; their minds are not yet mature.[43 44] As a stressful event, prolonged quarantine may significantly impact their outlook on life and employment preferences. In the post-pandemic era, the employment situation for graduates is more severe and complex. At the moment, however, graduates are still receiving inadequate instruction in employment, and their perception of employment is still relatively shallow.[45] Moreover, after a prolonged quarantine, graduates generally have negative and pessimistic ideas about employment.[45] Therefore, how to help graduates improve their career planning and develop employment guidance to keep pace with the times is an essential issue for future university educators to explore.

Practical implications

Our findings suggest that university students experience complex and variable psychological experiences during the long-term quarantine, which indicates that psychological intervention is not achieved overnight. Psychological health workers need to develop targeted psychological interventions based on the psychological status of different students which also conform to the national conditions. The combination of online and offline psychological services may be extremely effective in improving the psychological health of students.

In addition, because of the large population in China, the situation is more complex and the management of students is more difficult during the quarantine. Therefore, the implementation of psychological nursing for university students during quarantine needs joint efforts in many aspects. At the same time, the nation needs to promote the cooperation between family, community and school through the formulation of relevant policies to jointly maintain the psychological health of university students.

In the future, large-scale national cross-sectional surveys can be conducted to study the psychological experience of university students who experienced the epidemic and

long-term quarantine. Research on the psychological situation of university students in the post-pandemic era is recommended, to explore whether long-term quarantine and the pandemic have had a prolonged psychological impact on them, and explore ways to help students better adapt to life in the post-pandemic era.

STRENGTHS AND LIMITATIONS

To the best of our knowledge, our study is the first in China to explore the psychological experience of university students who have experienced prolonged quarantine through qualitative interviews. However, there are still some limitations to this study. First of all, the results of this study were derived from qualitative interviews rather than quantitative research; thus, its universality may be affected. However, it is essential to acknowledge that these results are derived from the inner real experience of quarantined university students and are unaffected by the scale. Second, we could not conduct face-to-face interviews with participants due to the pandemic limitations, which may have affected the validity of the interviews. Ultimately, the participants were all university students from Shanghai, China. Therefore, our results may not apply to university students who are quarantined in different regions, especially in other countries.

CONCLUSION

Our study helps us to fully understand the changes and needs of university students who have experienced prolonged quarantine. Based on the result, we gained a deeper understand of the impact of the pandemic and quarantine on the emotions, psychology, attitudes, needs and outlook on life of university students in China. University students experience dynamic and complex emotional changes during prolonged quarantine including positive and negative emotions at different levels. For a variety of reasons, they expressed a desire for diversified support. As a stressful event, prolonged quarantine greatly impacts immature university students' outlook on life and career. The results of this study can be taken into account in the construction of psychological interventions and emergency response plans in the future. According to the characteristics and needs of university students who have experienced stressful events, mental health workers and university administrators can provide individualised psychological intervention and support to help them sustain their mental health and better navigate early adulthood.

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