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Original Article

# The impact of the COVID-19 pandemic on the mental health of young people: A comparison between China and the United Kingdom

Ming-Bo Liu [a, 1], Géraldine Dufour [b, 1], Zhuo-Er Sun [c, d, 1], Julieta Galante [e], Chen-Qi Xing [c, d], Jing-Ye Zhan [c, d], Li-Li Wu [c, d, f, *]

[a] School of Social Development and Public Policy, Fudan University, Shanghai, 200433, China
[b] University Counselling Service, Student Services Centre, University of Cambridge, Cambridge, CB3 0 PA, UK
[c] Lab for Post-traumatic Stress Disorder, Faculty of Psychology and Mental Health, Naval Medical University, Shanghai, 200433, China
[d] The Emotion & Cognition Lab, Faculty of Psychology and Mental Health, Naval Medical University, Shanghai, 200433, China
[e] Department of Psychiatry, University of Cambridge, Cambridge, CB2 8AH, UK
[f] Shanghai Key Laboratory of Mental Health and Psychological Crisis Intervention, School of Psychology and Cognitive Science, East China Normal University, Shanghai, 200062, China

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ABSTRACTS

*Purpose:* As COVID-19 spreads globally and affects people's health, there are concerns that the pandemic and control policies may have psychological effects on young people (age from 17 to 35 years). This psychological impact might vary in different countries, and thus we compared the prevalence of self-reported psychological distress, loneliness and posttraumatic stress symptoms (PTSS) among young people in the United Kingdom (UK) and China at the beginning of the COVID-19 pandemic.

*Methods:* Data of this study came from two sources. One source was the first wave of COVID-19 study in Understanding Society, a special wave of the UK household longitudinal study, which provided the high-quality, national-wide representative panel data. The sample comprised 1054 young people. The other source was an online survey on the mental health of 1003 young people from Shanghai, a highly developed area in China. The questionnaire included questions on the prevalence of common mental disorders (cut-off score $\geq$ 4), loneliness and potential PTSS (cut-off $\geq$ 33). Univariable analyses were conducted to test the differences in the self-reported prevalence of psychological distress and loneliness between the two groups. Multivariable logistic regression analyses were run to explore the predictors of psychological distress and loneliness among all the young people from England and Shanghai.

*Results:* Among the samples with self-reported psychological distress, the UK sample accounted for 34.4% ($n$=1054) and the Chinese sample accounted for 14.1% ($n$=1003). The difference between the two groups was statistically significant ($p < 0.001$). Additionally, 57.1% of people in the UK and 46.7% in China reported that they sometimes or often felt lonely, of which the difference is statistically significant ($p < 0.001$). Regression analysis of the entire samples showed that nationality, gender, psychotherapy and loneliness were significant predictors of 12-item General Health Questionnaire scores, while the variables of age and living alone were not. Significant predictors of self-reported loneliness were the nationality, gender, age, living alone and psychotherapy. In China, 123 (12.3%) young people, 49 men (11.3%) and 74 women (13.0%), met the criteria of PTSS symptoms (cut-off scores $\geq$ 33). These scores were only collected in China.

*Conclusion:* This evidence suggests that mental health and loneliness reported by young people were lower in China than that in the UK during the studied period. More research is needed to understand these differences. If the differential negative psychological impacts are confirmed, country-specific measures of prevention and intervention should be adopted to improve the mental health of young people under the ongoing impact of the pandemic.



* Corresponding author. Lab for Post-traumatic Stress Disorder, Faculty of Psychology and Mental Health, Naval Medical University, Shanghai, 200433, China.
*E-mail address:* wll_88@163.com (L.-L. Wu).

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[1] these authors contributed equally to this work.

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## Introduction

As the COVID-19 outbreak in the end of 2019 and spread around the world, the World Health Organization declared it a public health emergency of international concern on 30th January,[1] and a global pandemic on 11th March.[2] The number of confirmed cases and deaths from the outbreak continues to grow rapidly.[3] As on 18 April, 2021, 140,332,386 cases and 3,004,088 related deaths have been confirmed.[3] The threat of the coronavirus itself not only caused a huge impact on humans, the anti-epidemic measures[4] such as wearing masks, keeping social distance, prohibition of group gatherings, blockades, quarantines, curfews, suspension of business, working at home, learning online, etc., have also greatly changed people's daily life. There are reports that the pandemic and prevention measures are significantly affecting people's mental health.[5–7] According to the Diagnostic and Statistical Manual, 5th version (DSM-5, American Psychiatric Association, 2013[8]), the definition of trauma is "actual or threatened death, serious injury, or sexual violence". The population affected by the COVID-19 pandemic is relatively large, which meets the criteria of trauma definition.

There is evidence that the widespread prevalence of major infectious diseases also has significant potential for psychological "contagion", which typically causes widespread fear, anxiety and various psychological problems, and affects patients, their relatives, medical workers and even residents in the epidemic areas.[9,10] Following the aforementioned patterns, COVID-19 spreads worldwide, and causes widespread and serious psychological distress and disorders, including phobias, avoidance and compulsive behaviours, generalized anxiety disorder,[11] depression,[12] insomnia[13,14] and posttraumatic stress symptoms (PTSS),[15] as well as physical symptoms and loss of social function.[16] Reports of common psychological disorders (encompassing psychological distress, depression and anxiety) were more than specific psychiatric disorders (e.g. psychotic disorders).[17–19] There have been further reports that the young people are more affected by the pandemic due to their life stages, as their study, work and social life are more affected by the pandemic. Previous studies found that the pandemic had a greater psychological impact on young people than that on the other age groups,[6,7,19] and therefore this study focuses only on young people. It aims to explore the reported psychological impact on young people in China and the UK.

The COVID-19 pandemic has been shown to increase the social isolation and loneliness,[20,21] and studies have shown that loneliness is strongly associated with psychological disorders.[22,23] Previous studies have found that younger people were more likely to report loneliness than older people,[19] and therefore this study also explored how young people reported the impact of loneliness during the epidemic.

The COVID-19 outbreak began in December 2019, and most people were affected by or were at risk of the pandemic. Studies have confirmed that due to the impact of the epidemic, some people suffered from varying degrees of PTSS[15,24–26] and some PTSS patients have worsened.[27] Taking into account the reported level of potential trauma caused by COVID-19, in this study we explored the incidence and predictors of PTSS in young people.

Different countries around the world responding to the pandemic have adopted diverse measures to prevent infection. Cultural and socio-political responses as well as differences in health systems, health care provision and different levels of the epidemic development may all have impacted on the mental health of young people. Additionally, the aim of this study was to investigate the differences in the reported prevalence of common mental health issues and loneliness among young people in the UK and China during the global COVID-19 pandemic.

## Methods

### Data

The data of this study came from two sources. One of them was the first wave of Understanding Society COVID-19 Study, a special wave of the UK Household Longitudinal Study, which provides high-quality, nationally representative panel data.[28] The sample comprised 1054 young people from the UK (mean age 23.30 ± 3.82 years). The other source of data is an online survey on the mental health of 1003 young Chinese people with the mean age of (23.18 ± 1.74) years from Shanghai, a highly developed city in China. The ages of the two groups of young people ranged from 17 to 32 years old. The Shanghai sample matched with the UK sample in term of age and gender.

### Procedures

In the survey of young people in Shanghai, China, a mental health questionnaire was released to them on the internet (www.wjx.cn), and it was promoted through the social media network on the Chinese platform "Wechat", from June 23rd to July 14th, 2020. Volunteer participants aged 18–32 years were recruited. They were asked to log into a page on the "Wechat" and complete the questionnaire, without any monetary compensation or incentive. At the time of the survey, the COVID-19 epidemic had not been completely controlled in the Xinfadi area of Beijing, and many people were worried that it would break out again across the country.

A main difference in the study of the UK is that the participants were recruited using stratified and clustered sampling before the start of the COVID-19 pandemic. The survey consisted of an online questionnaire, and those people having no internet access were interviewed through telephone by trained professionals. The survey was sent out and completed from June 25th to July 1st, 2020, and the research data were published on the UK Data Service website on July 31st. Participants were not paid for completing the survey. By June 25th, 2020, there had been 281,486 confirmed COVID-19 cases and 40,429 associated deaths in the UK (Public Health England, 2020). More details of the procedures can be found in the Understanding Society COVID-19 Study User Guide.[28]

### Measures

The prevalence of self-reported psychological distress was measured using the 12-item General Health Questionnaire (GHQ-12), a validated scale for measuring psychological distress widely used in the non-clinical settings.[6,29] Researchers[30] showed that the Chinese version of GHQ-12 had good reliability and validity, and was served as a screening tool to detect anxiety and psychological disorders. The Chinese version of GHQ-12 has a satisfactory reliability in this study, and Cronbach's alpha reliability is 0.924. GHQ-12 has 12 questions about respondents' depressive and anxiety symptoms, confidence and overall happiness, etc., which are measured on a 4-point scale (from 1 to 4, 1 = "less than usual", and 4 = "much more than usual"). A GHQ-12 score of 4 or more indicates the possible case of common mental disorders.[31] Hence, we used this dichotomous indicator to estimate the self-reported prevalence of psychological distress, which may indicate a common mental disorder.

Reporting of loneliness was measured by one question adopted from English Longitudinal Study on Ageing, which was translated into Chinese for Shanghai participants. Respondents were asked "In the last 4 weeks, how often did you feel lonely?" with 3 options: "hardly ever or never", "some of the time" and "often".

Reports of PTSS were assessed using the posttraumatic stress disorder (PTSD) checklist for DSM-5 (PCL-5),[32] for the participants from Shanghai only. The PCL-5 is a self-report measurement, consisting of 20 items that correspond directly to the DSM-5 PTSD. Each item reflects the severity of a particular symptom, rated on a 5-point Likert scale from 0 (not at all) to 4 (extremely) during the previous month. The severity (total symptoms) of PTSS was defined by the sum of scores of all the PCL-5 symptoms. The Chinese version of PCL-5 has been psychometrically validated, which is widely used in trauma-related research and practice in China.[33] This scale was solely used in the Chinese survey and not present in the UK sample.

In the Chinese questionnaire, additional questions were added about the potential impact of COVID-19 on participants recruited in Shanghai. The items were as follows: fear of COVID-19, fear of contacting with recovered patients, fear of people from risk areas, impact of COVID-19 on family, impact of COVID-19 on intimate relationships and impact of COVID-19 on work or study. These questions were rated on a 5-point Likert scale from 1 (not at all) to 5 (extremely). In addition, a number of socio-demographic characteristics, including whether they lived alone, and the use and availability of psychotherapy were investigated. These questions were assessed as “yes” or “no”.

### *Statistical analysis*

Firstly, the socio-demographic data of the participants from England and Shanghai were compared (*t*-test and Chi-squared tests). Secondly, univariable analyses were conducted to test the differences in the self-reported prevalence of psychological distress and loneliness between the two groups. Thirdly, multivariable logistic regression analyses were run to explore the predictors of psychological distress and loneliness among all the young people from England and Shanghai. All the regression models were built using the Enter method with all covariates being entered into models at the same time. Missing values were handled by listwise deletion. Last, a logistic regression model was used to identify independent variables associated with PTSS among the young people in China.

## Results

### *Differences in responses between young people in the UK and China*

Table 1 compared the characteristics of our samples. There were no statistically significant differences in gender or age between young people in the UK and China. Young people in China were significantly more likely to live alone and demanded for psychotherapy than those in the UK. There were no significant differences in psychotherapy availability.

### *Differences in psychological distress and loneliness*

Table 2 shows the self-reported prevalence of psychological distress and loneliness among the young people of England, the UK and Shanghai, China, and reports the results with comparison of the prevalence between the two groups conducted by using Chi-squared tests or Mann-Whitney *U* test. Firstly, we found that 34.4% of population in the UK and 14.1% in China had self-reported scores indicative of common mental disorders (total score of GHQ-12 $\geq$ 4), and the difference between the 2 groups was statistically significant ($\chi^2 = 115.42$, $p < 0.001$). Secondly, 57.1% of the sample population in the UK and 46.7% in China reported feeling lonely sometimes or often, and the difference was significant statistically ($U = 467838.00$, $p < 0.001$). In other words, at the time of the survey during the epidemic, young people in England, UK reported feeling lonely significantly more often than that in Shanghai, China. Furthermore, young people in the UK had a significantly higher reported prevalence than those in China of all the 12 symptoms of common mental disorders measured by the GHQ-12. For more details about the comparisons of the 12 symptoms of GHQ-12, see Appendix Table S1.

### *Predictors of psychological distress and loneliness*

The results of the regression analysis are presented in Table 3. Multivariable regression analyses were used to explore whether the country, gender, age, living alone, use of psychotherapy and loneliness predict self-reported psychological distress; and to explore whether the country, gender, age, living alone and use of psychotherapy predict the feeling of loneliness. The *t*-values and *F* values in both models were statistically significant ($p < 0.001$), suggesting that the fitness of the 2 models are significantly better than null (constant only) model.

Firstly, the results of the regression analysis for the sample showed that the country, gender, use of psychotherapy and loneliness were significant predictors of psychological distress, while the age and living alone were not. The participants in the UK were at significantly higher odds of psychological distress than those in China, and females were at significantly higher odds of psychological distress than males. Young people reporting no requirement of psychotherapy had significantly higher odds of self-reported psychological distress than those reporting requirement of psychotherapy. Young people who reported feeling lonely had significantly higher odds of self-reported psychological distress than those who expressed lower levels of loneliness. Among young people in the UK, demand for psychotherapy and reporting loneliness significantly predicted self-reported psychological distress. The gender, demand for psychotherapy and loneliness of participants in China significantly predicted psychological distress.

Second, the results of the regression analysis on reported loneliness for the samples showed that the country, gender, age, living alone and use of psychotherapy were significant predictors of loneliness (Table 3). The participants in the UK had significantly higher odds of experiencing loneliness than those in China. Females had significantly higher odds of experiencing loneliness than males. Older respondents expressed relatively less loneliness than the younger ones. Respondents who lived alone had significantly higher odds of loneliness than those who lived with others. Respondents who did not report needing psychotherapy had significantly lower odds of loneliness than those who stated a need to access psychotherapy. For the group in the UK, the age and no use of psychotherapy were not predictors of loneliness, and for the group in China, gender, age, and use of psychotherapy were not predictors of loneliness.

These regression analyses have showed that living alone can predict self-reported loneliness, and feelings of loneliness can predict self-reported psychological distress, but living alone was not a predictor of psychological distress. Loneliness may play a mediating role between living alone and mental distress (Appendix Fig. S1).

### *Predictors of the prevalence of PTSS in young people in China*

In total, 123 (12.26%) young people in Shanghai, 49 men (11.26%), and 74 women (13.03%), met the criteria of PTSS symptoms (PCL-5 scores $\geq$ 33). Table 4 shows the results of the regression analysis on PTSS among young people from Shanghai. Reported use of psychotherapy, loneliness, fear of COVID-19 and impact of COVID-19 on work or study, could all significantly predict

**Table 1**
Characteristics of 1054 samples in the UK and 1003 samples in China, *n* (%).

| Variables | England, the UK | Shanghai, China | $\chi^2/t$ value | *p* value |
|---|---|---|---|---|
| Age (mean ± SD) (years) | 23.30 ± 3.821 | 23.18 ± 1.744 | 0.942 | 0.347 |
| Sex | | | 2.453 | 0.117 |
| Male | 420 (39.8) | 435 (43.4) | | |
| Female | 631 (59.9) | 568 (56.5) | | |
| No report | 3 (0.3) | | | |
| Living alone | | | 44.443 | < 0.001 |
| Yes | 65 (6.2) | 148 (14.8) | | |
| No | 989 (93.8) | 821 (81.9) | | |
| No report | | 34 (3.3) | | |
| Demand for psychotherapy | | | 78.023 | <0.001 |
| Yes | 39 (3.7) | 150 (15.0) | | |
| No | 1015 (96.3) | 853 (85.0) | | |
| Psychotherapy availability | | | 0.972 | 0.324 |
| Yes | 25 (64.1) | 83 (55.3) | | |
| No | 14 (35.9) | 67 (44.7) | | |

**Table 2**
Differences in psychological distress and loneliness between 1054 samples in the UK and 1003 samples in China, *n* (%).

| Variables | England, the UK | Shanghai, China | $\chi^2$/Mann-Whitney U | *p* value |
|---|---|---|---|---|
| GHQ-12 | | | 115.42 | < 0.001 |
| Positive | 363 (34.4) | 141 (14.1) | | |
| Negative | 691 (65.6) | 862 (85.9) | | |
| Loneliness | | | 467838.00 | < 0.001 |
| Hardly ever or never | 452 (42.9) | 535 (53.3) | | |
| Sometime | 481 (45.7) | 392 (39.1) | | |
| Often | 120 (11.4) | 76 (7.6) | | |
| Not reporting | 1 (0) | | | |

GHQ-12: 12-item General Health Questionnaire.
*: GHQ-12 scores exceeding threshold indicative of clinically significant levels of mental distress (4 or more points).

**Table 3**
Predictors of psychological distress and loneliness of samples in the UK and China during the COVID-19 pandemic.

| Model | Variables | Total ($n = 2019$) | | | England ($n = 1050$) | | | Shanghai ($n = 969$) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | *OR* | 95% *CI* | *p* value | *OR* | 95% *CI* | *p* value | *OR* | 95% *CI* | *p* value |
| 1[a] | Country (Ref. = Shanghai, China) | 3.943 | 3.035–5.123 | <0.001 | | | | | | |
| GHQ-12 | Gender (Ref. = female) | 0.717 | 0.562–0.915 | 0.007 | 0.735 | 0.539–1.003 | 0.052 | 0.669 | 0.445–1.005 | 0.053 |
| | Age | 0.994 | 0.958–1.031 | 0.730 | 1.009 | 0.969–1.050 | 0.681 | 0.915 | 0.814–1.029 | 0.137 |
| | Living alone (Ref. = no) | 1.094 | 0.749–1.597 | 0.643 | 0.733 | 0.401–1.338 | 0.311 | 1.415 | 0.872–2.296 | 0.160 |
| | Demand for psychotherapy (Ref. = no) | 3.882 | 2.319–6.501 | <0.001 | 3.597 | 1.021–12.667 | 0.046 | 4.121 | 2.339–7.261 | < 0.001 |
| | Psychotherapy availability (Ref. = no) | 0.830 | 0.427–1.611 | 0.581 | 0.823 | 0.175–3.870 | 0.805 | 0.762 | 0.362–1.606 | 0.475 |
| | Loneliness (Ref. = no) | 6.622 | 5.050–8.685 | <0.001 | 7.426 | 5.322–10.363 | <0.001 | 5.369 | 3.361,8.579 | < 0.001 |
| 2[b] | Country (Ref. = Shanghai, China) | 1.769 | 1.470–2.129 | <0.001 | | | | | | |
| Loneliness | | | | | | | | | | |
| | Gender (Ref. = female) | 0.672 | 0.558–0.808 | <0.001 | 0.517 | 0.396–0.674 | <0.001 | 0.895 | 0.688–1.164 | 0.407 |
| | Age | 0.965 | 0.936–0.995 | 0.022 | 0.968 | 0.935–1.003 | 0.070 | 0.988 | 0.916–1.065 | 0.750 |
| | Living alone (Ref. = no) | 1.676 | 1.236–2.272 | 0.001 | 1.932 | 1.101–3.390 | 0.022 | 1.662 | 1.155–2.392 | 0.006 |
| | Demand for psychotherapy (Ref. = no) | 5.872 | 3.185–10.826 | <0.001 | 3.928 | 0.865–17.830 | 0.076 | 6.129 | 3.152–11.916 | < 0.001 |
| | Psychotherapy availability (Ref. = no) | 0.279 | 0.136–0.571 | <0.001 | 1.014 | 0.158–6.489 | 0.989 | 0.211 | 0.096–0.462 | < 0.001 |

Model 1 and Model 2 used logistic regression. Missing values were handled by listwise deletion. GHQ-12 (12-item General Health Questionnaire) scores exceeding threshold indicative of a clinically significant level of general psychiatric disorders (4 or more).
*OR*: odds ratio, Ref.: reference, 95% *CI*: 95% confidence interval.
[a] The dependent variable of Model 1 is psychological distress.
[b] The dependent variable of Model 2 is loneliness. Participants who chose "hardly ever" or "never" were considered not to have a sense of loneliness. Participants who chose "some of the time" or "often" were considered to have a sense of loneliness.

self-reported presence of PTSS among young people from Shanghai in the sample.

## Discussion

Although studies on the prevalence of specific psychiatric disorders during COVID-19 have been extensive, the results of existing researches vary widely due to differences in the sample sources, age of participants and development stage of the epidemic in participants' countries. This study compared the self-reported prevalence, and predictors of psychological distress and loneliness between samples of young people from England and Shanghai, two developed but culturally distinct regions of the world, during the COVID-19 pandemic. The samples had a similar age and gender ratio, but the self-selected Chinese sample was not nationally representative.

**Table 4**
Predictors of PTSS in the Chinese sample during COVID-19 ($n = 969$).

| Variables | *OR* | 95% *CI* | *p* value |
|---|---|---|---|
| Gender (Ref. = female) | 0.760 | 0.466–1.237 | 0.269 |
| Age | 0.935 | 0.814–1.074 | 0.342 |
| Living alone (Ref. = no) | 1.218 | 0.665–2.230 | 0.523 |
| Demand for psychotherapy (Ref. = no) | 4.021 | 2.098–7.708 | < 0.001 |
| Psychotherapy availability (Ref. = no) | 0.856 | 0.356–2.059 | 0.729 |
| Loneliness[a] (Ref. = no) | 2.986 | 1.677–5.318 | <0.001 |
| Fear of COVID-19 | 2.779 | 2.172–3.555 | < 0.001 |
| Fear of recovered patients | 1.148 | 0.827–1.594 | 0.409 |
| Fear of people from the affected area | 0.841 | 0.597–1.186 | 0.324 |
| Impact of COVID-19 on family | 0.993 | 0.767–1.286 | 0.957 |
| Impact of COVID-19 on intimate relationship | 1.171 | 0.922–1.488 | 0.196 |
| Impact of COVID-19 on work or study | 1.277 | 1.031–1.583 | 0.025 |

PTSS: posttraumatic stress symptoms, OR: odds ratio, Ref.: reference.
Model used logistic regression. The dependent variable is whether the severity of post-traumatic stress symptoms has clinical significance. PCL-5 scores exceeding threshold indicative of a clinically significant level of posttraumatic stress symptoms (33 or more).
[a] Participants who chose “hardly ever” or “never” were considered not to have reported a sense of loneliness. Participants who chose “some of the time” or “often” were considered to have reported a sense of loneliness.

Pierce et al.[6] used the GHQ scale to assess changes in the mental health of the UK population and studied the difference between pre-dating the COVID-19 epidemic and the subsequent quarantine period. Compared to the previous year, they found an overall increase in mental disorders in the UK people aged 16–44 years old. Our study also documented the higher prevalence rate of self-reported psychological distress (34.1%) in England, which was higher than that in the Shanghai samples (14.1%), during the surveyed period of the COVID-19 pandemic. There are many potential reasons for these differences. The pre-pandemic prevalence of disease and the severity of epidemic reported may be different in 2 countries. According to the data of World Health Organization,[34] on July 1st, 2020, when the survey was completed in the UK, there were 167,150 cumulative cases and 4729 new cases; while in China, there were 85,245 cumulative cases and five new cases. In the two countries, the severity of the reported outbreaks was different in scale. If young people in the UK felt more vulnerable to the epidemic, this perhaps impacted on the stress levels of self-reported. It is impossible to prove the causality, but there might be cultural markers that influence cultural expressions of distress display. It might be that Chinese culture encourages self-reliance, but discourages reporting of demand to change external environment. Influenced by Confucian culture, traditional Chinese mental health concepts encourage people to restrain their emotions, avoid interpersonal conflicts, and suppress personal rights in order to maintain harmony with others and follow the laws of nature.[35] Inspired by these traditional cultures, young Chinese people might be more active in facing the epidemic prevention measures (e.g. social distancing).

Our study also showed that the prevalence rate of reported loneliness of young people in Shanghai (46.7%) was significantly lower than that in the UK (57.1%). Researches show that loneliness decreased with collectivism, and increased with individualism.[36,37] According to the Hofstede's individualism index, Chinese typical culture is collectivism, while British is individualism. Compared with in individualistic culture, in collectivist culture it reports a closer social network pattern and connection between people.[38] Young people in both countries reported high rates of loneliness. In China, although the epidemic was not being reported as severe as in the UK, prevention measures such as social distance, lockdown and quarantine had not been eliminated, and face-to-face social interactions were still restricted or affected.

The results of the study show that although living alone is an important risk factor for loneliness, reporting loneliness but not living alone indicates psychological distress. In other words, during the period of the survey in the COVID-19 pandemic, living alone has not directly affected psychological distress. People living alone are more likely to report psychological distress, only if they felt lonely. Previous studies have shown that loneliness is positively associated with common mental disorders such as depression.[18,23] In addition, some researchers have found that participants who were socially isolated or lonely had a higher mortality rate.[18,23] After adjusting the demographic factors and baseline health, social isolation remained statistical significance associated with the mortality.[39] Thus, during the epidemic, we need to pay more attention to young people's feeling of loneliness, which could be explored in the clinical assessments. In addition, long-term interventions and methods need to be developed to help individuals maintain the necessary social contact and sense of belonging in the community, and maintain people's mental health.

We also found that the country of residence, gender and psychotherapy used are the significant predictors of self-reported psychological distress and loneliness under the impact of the epidemic. Females living in England reported a need for psychotherapy, but did not receive it, which showed a higher risk of mental health problems.

We have found that PTSS in the Chinese sample were self-reported, which were consistent with some other studies.[14,15,24–26,40] PTSS self-reports were significantly correlated with the use of psychotherapy, reported loneliness, fear of COVID-19 and impact of COVID-19 on work or study. During the prevention and control of epidemics, the measures aimed at improving the availability of psychological services, reducing people's loneliness and fear, and making efforts to reduce learning or work disabilities, which could be helpful to prevent and reduce the prevalence of PTSS.

A limitation of the study is that we cannot make a clear causal claim. Since the epidemic situation between the two countries is very different and there is no pre-pandemic sample to compare results, the difference in mental health status cannot be attributed to the predictors we choose. We only use one question to measure loneliness, not the psychometrically validated loneliness scale, so these results should be interpreted with caution. Another limitation is that the PTSS was not included in the data of the UK, so we were unable to make a comparison between China and the UK. Further researches should consider comparing PTSS or PTSD between different countries or cultures, and study the impact of culture on willingness to self-report psychological distress.

During the study of the COVID-19 pandemic, possibly due to the different prevention or control policies between China and the UK, cultural norms for self-disclosure and reporting of feelings, and the development of the epidemic, the mental health of young people in the two countries is significantly different in terms of the self-reported psychological distress, loneliness, and other aspects. More country- or culture-specific measures of prevention and intervention should be adopted to improve the mental health of the public under the ongoing impact of the pandemic.

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## Ethical statement

This study was approved by the ethics committees of Naval Medical University.

## Declaration of competing interest

The authors declare that they have no conflicts of interest.

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## Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.cjtee.2021.05.005.

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