A Survey Analysis of Psychological Impact on Chinese during Quarantine against COVID-19

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Abstract

Objective: Few studies have investigated the psychological impact throughout a major epidemic, such as COVID-19. This study aimed to evaluate the psychological state of individuals experienced quarantine and to provide evidence to reduce the impact of quarantine after COVID-19.

Methods: A questionnaire-based survey conducted by using an internet site using 631 individuals who lived in China in the year 2020. Spearman rank correlation analysis was used for the data analysis.

Results: Approximately 9.97% of the study participants reported that they did not feel good about his or her health condition. Approximately 50.16% of participants had experienced various levels of anxious and nervous feelings. Approximately 5.91% of participants reported anxious or nervous feelings almost every day. By using the spearman rank correlation analysis, we observed that anxious and nervous feelings appeared to be correlated with the frequency of receiving negative news, current health situation and time spent on receiving information related to COVID-19.

Conclusion: A long-term quarantine is likely to have some level of impact on health conditions among relatively healthy individuals. The survey study may suggest that government and hospital workers should pay close attention to the psychological change experienced by quarantined individuals.

Introduction

The current outbreak of the novel coronavirus has spread throughout the world since December 2019 in Wuhan, Hubei, China.¹⁻³ On February 12, 2020, the World Health Organization (WHO) announced the official name for the disease: Corona Virus Disease 2019 (COVID-19).⁴⁻⁶ COVID-19 had caused unprecedented impacts on people's daily life in China. One of the most significant impacts on individuals was that they have to keep quarantined all day. It was anticipated that the quarantine experience might cause negative psychological effects including fears of being infected, frustrations, boredom, inadequate supplies (including both food and medical recourses), and possible financial loss^{7,8}. In our view, understanding the psychological effects of quarantine in relation to COVID-19 may potentially inform risk condition and interventions addressing behavioral change.

Earlier efforts have focused on describing the clinical course, counting severe cases, and treating individuals with more severe symptoms^{5,9-12}. There is a need to quantify the impact of uninfected people's health condition resulting from outbreak of COVID-19.^{13,14} It has been anticipated that negative information can be repeated and perpetuated via social media. Such conventional outlets put public health at a disadvantage¹⁵. We aimed at applying a reliable method to obtain more information about COVID-19, such as transparent identification of cases, data sharing, recent research on COVID-19, and so on.¹⁶ Albeit the fact that it might be difficult to prevent the virus spread, effectively sharing reliable scientific information might serve as the most effective prevention against the public panic about COVID-19. With the better control of COVID-19 (e.g. less individuals were being infected), more attention will then

give to the citizens who were told to quarantine. After a long-time quarantine, these citizens' health condition may have changed more or less¹⁷.

To collect the most information possible in a limited time period, we conducted a questionnaire-based research. This work described an internet-based investigation to explore the current status of citizens' health change during quarantine and helped medical workers to pay more attention to citizens' emotional burden, psychological stress, and physical strength.

Methods

Questionnaire Design

After consulted a wealth of literature sources, we designed a questionnaire for the quarantined individuals who are going through COVID-19 epidemic (Table S1). The questionnaire was conducted among 631 participants. The questionnaire contained a yes-or-no question and asked respondents' degree of being anxious and worrying during the COVID-19 epidemic. The questionnaire including 19 items could be completed in 15–20 minutes. The first set of questions covered demographics and the second set of questions focused on psychology-related information and the third set of questions focused on the quarantine status. Specifically, demographic data included 6 items: age, gender, educational level, marital status, occupation and working area. The psychology-related questions included 7 items: hard to relax, become easily upset or irritable, cannot sit still, cannot stop worrying, feel nervous or anxious, feel something bad about to happen, and worry too much. Quarantine status-related question included: whether was under quarantine or not; how long had been under quarantine; how often spent on the outbreak; how often received fake news or received negative news, and current health situation.

Participants

The participants were recruited from WeGene, a biotechnical company offers genotyping service. These volunteered study participants previously received the Direct-to-Consumer (DTC) Personal Genome Service before. Upon our invitation, the study participants reported their condition online. All participants had provided informed consent and participated online, under a protocol approved by the Ethical Committee of WeGene, Inc. Questionnaire data were collected between February 12th and 27th, 2020. In the end, a total of 631 participants were included our analysis. All methods were performed in accordance with the relevant guidelines and regulations.

Variables collected

The response for each question was recorded (Table S1). Using the questionnaires designed, we had investigated demons variables including age, gender, marital status, educational level and occupation. Age was treated as a continuous variable. Gender was categorized as males and females. Marital status

was categorized as unmarried, married, divorced and widowed. Educational level was grouped into three levels: (i) middle school or lower; (ii) bachelor; (iii) master or higher.

In addition, we also recorded the psychological related items including hard to relax (none/several_days/over_a_week/almost_everyday), become easily upset or irritable (none/several_days/over_a_week/almost_everyday), cannot sit still (none/several_days/over_a_week/almost_everyday), cannot stop worry (none/several_days/over_a_week/almost_everyday), feel nervous or anxious (none/several_days/over_a_week/almost_everyday), feel something bad about to happen (none/several_days/over_a_week/almost_everyday), and worry too much(none/several_days/over_a_week/almost_everyday).

Data analysis

The characteristics of study participants were summarized using descriptive statistics, including count and percentage for categorical variables; means and standard deviations (SD) for continuous variables. Correlation between different categorical variables were performed using the spearman rank analysis. Variables giving a p-value less than 0.05 were considered as statistically significant. All analyses were performed using R language and environment.

Results

To interpret the results obtained, we gave an analytical description and targeted interpretation of the answers to the items included in the questionnaire that contained the demographic characteristics of 631 participants. Demographic results of the present study were given in the following sections. The participants' age ranged from 10 to 67(mean=29.39, sd=0.372). All participants who joined this study on a volunteer basis. In addition, a substantial majority of participants (568, 90.02%) had at least a bachelor's degree. Our survey results suggested that most of these participants were highly educated, and most of them had no professional background in the field of biomedicine, public health or psychology. (See table 1)

Concerns on COVID-19 Outbreak

Giving the severances of the COVID-19 epidemic outbreak, it was not surprising that citizens paid much attention to the outbreak. Among 631 participants, about 36.61% (231) of them "often" or "always" spent time on the COVID-19 news, 32.17% of participants "normally" spent time on the COVID-19 epidemic news, and the rest of them paid attention on outbreak news "sometimes". In addition, we also observed that negative information or fake news made up large proportion of participants' message source. 398 (63.07%) participants replied that more than a half of outbreak news was negative. It was likely to be an important factor accounting for participants' psychological disturbance.

Psychological Health

Our survey revealed that most of them felt good or excellent. In addition, we asked the participants seven questions about their levels of psychological feeling. Table 2 showed the levels of psychological feelings and participants' answers. We discovered that most of our participants were influenced by this epidemic outbreak, and that approximately 5% of the study participants reported a severe level of anxiety, as they had been worried during quarantine.

Spearman rank correlation analysis

The Spearman rank correlation analysis (Table 3) showed that current health situation had relation with hard to relax (p-value <0.001, $r=0.197$), cannot stop worrying (p-value <0.001, $r = 0.142$), easily upset or irritable (p-value <0.001, $r = 0.208$), cannot sit still (p-value = 0.002, $r = 0.126$), feel nervous or anxious (p-value = 0.008, $r = 0.106$), feel something bad about to happen (p-value <0.001, $r=0.171$) and worry too much (p-value <0.001, $r=0.144$).

Proportion of negative news appears to be correlated with hard to relax (p-value <0.001, $r=0.223$), cannot stop worrying (p-value <0.001, $r = 0.309$), easily upset or irritable (p-value <0.001, $r=0.248$), cannot sit still (p-value <0.001, $r=0.139$), worry too much (p-value <0.001, $r=0.277$), feel nervous or anxious (p-value <0.001, $r=0.322$), feel something bad about to happen (p-value <0.001, $r=0.232$).

Time spent on 2019nCoV related news seemed to be correlated with hard to relax (p-value <0.001, $r=0.231$), cannot stop worrying (p-value <0.001, $r = 0.295$), easily upset or irritable (p-value <0.001, $r=0.250$), cannot sit still (p-value <0.001, $r=0.217$), feel nervous or anxious (p-value <0.001, $r=0.315$), feel something bad about to happen (p-value <0.001, $r=0.265$) and worry too much (p-value <0.001, $r=0.327$).

In addition, whether participants who were under quarantine or not had correlation with feeling feel nervous or anxious (p-value = 0.042, $r = 0.081$), cannot stop worrying (p-value = 0.027, $r = 0.089$), suggesting quarantine was not an immediate cause for anxiety.

Conclusion

The work presented may highlight the importance of turning our attention to public psychological health condition, and indicated a strong need for medical workers to improve the quality of psychological evaluation. Most of our study participants who completed the survey were able to stay calm during the quarantine. Our interpretations for the current results were the following: The quarantined individuals might receive more updated information concerning the severity of the outbreak; In addition, the study participants might frequently communicate with each other through the internet; And individuals who were surveyed might have adequate supplies (both general and medical); And we would like to point out that, during the period of COVID-19, citizens were given the altruistic choice of quarantine.

However, quarantine can often be an unpleasant experience for those who undergo it. Some citizens had to deal with different levels of psychological problems. Factors including separation from loved ones, the loss of freedom, uncertainty over disease status, and boredom might lead to more negative impact. We

recommend that the government weigh carefully between potential benefits of mandatory mass quarantine and the possible psychological costs.

To sum, this study described the current psychological status of citizen'. Furthermore, the results reported may have important implications for the COVID-19 related psycho-behavioral research as well as potential public health interventions.

Declarations

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Author contributions statement

Y.Y. and G.C. conceived and went over this article. L.Z.W. and X.T.Y. performed data acquisition.

C.H.Q. and J.R.L. completed data analysis. C.H.Q. drafted this article. C.H.Q. and J.R.L. wrote the main manuscript text and completed the modification. All authors reviewed the manuscript.

Additional information

Competing interests

Li Zhong Wang, Xiao Tian Yao and Gang Chen are employees of WeGene Inc. All other authors declare no competing interests.

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Tables

Table 1. Demographic characteristics of 631 participants.

Demographic characteristics	Measures (N = 631)
Gender (%)	
Female	306 (48.49%)
Male	325 (51.51%)
Age (years)*	
Mean (SD)	29.39 (0.372)
Age Number (%)*	
≤18	24 (3.80%)
18 to 30	342 (54.20%)
30 to 40	187 (29.64%)
40 to 50	52 (8.24%)
≥50	26 (4.12%)
Educational Level	
College and above	568 (90.02%)
High school and below	63 (9.98%)
Occupation	
Health workers and medical students	45 (7.13%)
Other occupations	586 (92.87%)
Marital Status	
Married	166 (26.31%)
Unmarried	465 (73.69%)
Divorced	20 (3.17%)
Widowed	1 (0.16%)

Table 2. Psychological levels According to Frequency of Participants' Feeling.

	None	Several days	Over a week	Almost every day	Total
Feel nervous and anxious	312(49.84%)	216(34.50%)	61(9.74%)	37(5.91%)	626
cannot stop worrying	386(61.86%)	154(24.68%)	50(8.01%)	34(5.45%)	624
Worry too much	347(55.52%)	177(28.32%)	59(9.44%)	42(6.72%)	625
Be hard to relax	405(64.90%)	139(22.28%)	40(6.41%)	40(6.41%)	624
Cannot sit still	499(80.23%)	81(13.02%)	25(4.02%)	17(2.73%)	622
Become easily upset or irritable	375(60.10%)	169(27.08%)	45(7.21%)	35(5.61%)	624
Feel something bad about to happen	395(63.50%)	154(24.76%)	42(6.75%)	31(4.98%)	622

Table 3. Summary of correlations (r) between psychology-related variables and quarantine-related variables.

	1	2	3	4	5	6	7
Current health situation	0.106**	0.143***	0.144**	0.197***	0.126**	0.208***	0.171
Proportion of negative news	0.322***	0.309***	0.277***	0.223***	0.139***	0.248***	0.232***
Time spent on 2019nCoV	0.315***	0.295***	0.327***	0.231***	0.217***	0.250***	0.265***
Quarantined or not	0.081*	0.089*					

In the Table header, there were 7 psychology-related variables numbered, 1 for “Feel nervous or anxious”, 2 for “cannot stop worrying”, 3 for “Worry too much”, 4 for “Be hard to relax”, 5 for “Cannot sit still”, 6 for “Become easily upset or irritable”, and 7 for “Feel something bad about to happen”, respectively. Each row represented one quarantine-related variable.

*0.01 < p < 0.05, **0.001 < p < 0.01, ***p < 0.001.

Blank cells represent non-significant correlation coefficients.

Supplementary Files

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