

# Investigation of the Psychological Status of COVID-19 Patients and its Influence on Defecation in Jinshan Fangcang Shelter Hospital in Shanghai, China

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## ABSTRACT

**Objective:** To investigate the psychological state of asymptomatic Coronavirus Disease 2019 (COVID-19) infected patients in Fangcang Shelter Hospital and the influence of psychological state on defecation.

**Methods:** The psychological status, defecation disorder and anorectal diseases of asymptomatic COVID-19 infected patients admitted to a shelter hospital in the Jinshan District of Shanghai were investigated using an online questionnaire from May 1 to May 7, 2022.

**Results:** A total of 568 valid questionnaires were received, excluding the respondents who had defecation disorders before entering the Fangcang Shelter Hospital. A total of 452 questionnaires were included for data analysis and the detection rate of anxiety was 24.6% (111/452). The detection rate of difficult defecation was 39.6% (179/452). The incidence of difficult defecation was 57.7% (64/111) among the subjects with anxiety and 33.7% (115/341) among the subjects without anxiety. The incidence of difficult defecation in anxious subjects was significantly higher than that in non-anxious subjects ( $P < 0.001$ ). The proportion of patients with dry stool (bristol type 1-2), anal mass prolapse after defecation and perianal pain were higher in the group with difficulty in defecation than those without ( $P < 0.05$ ).

**Conclusion:** Asymptomatic COVID-19 patients had anxiety at the Fangcang Shelter Hospital, which may cause difficulty in defecation and induce anorectal diseases.

**Key Words:** Asymptomatic infection; Anxiety; Defecation disorder; Anorectal diseases

## INTRODUCTION

Coronavirus Disease 2019 (COVID-19) is a highly infectious disease caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) [1]. As of May 2022, COVID-19 has caused more than 500 million infections and 6 million deaths worldwide, seriously endangering people's lives and causing a substantial economic burden to society [2]. Regarding pandemic prevention and control, the use of Fangcang Shelter Hospitals has played a vital role in the rapid containment of COVID-19 [3,4]. As a fixed-point hospital for people with asymptomatic infections, the shelter hospital can reduce cross-infection between patients, prevent the spread of the pandemic and reduce the pressure on the medical system [5]. Because of the sudden spread of the pandemic and the isolation of the shelter, COVID-19 infected people may have different degrees of psychological state changes, such as anxiety and depression [6,7]. Changes in psychological

status are related to defecation [8]. Anxiety can slow intestinal motility, cause constipation and even induce anorectal diseases [9]. However, the impact of changes in psychological status on defecation in the centralized isolation state of the Fangcang Shelter Hospital is still unclear. The purpose of this study was to observe changes in the psychological state of asymptomatic COVID-19 infected patients under the specific environment of the Fangcang Shelter Hospital and the impact of the psychological state on defecation to provide a reference for targeted psychological and dietary follow-up interventions.

## MATERIALS AND METHODS

### Study participants

This study included asymptomatic COVID-19 patients at the Jinshan Fangcang Shelter Hospital from 1 May 2022 to 7 May 2022. All

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participants were diagnosed based on the Chinese National Diagnosis and Treatment Guidelines (CNDTG) for COVID-19 and had normal reading and writing skills (able to understand and complete the questionnaire). Patients with some conditions were excluded such as completion time of the questionnaire less than 1 minute, missing or incorrect data filling and abnormal defecation before admission to the Jinshan Fangcang Shelter Hospital.

### Study design

A cross-sectional study design was used. In this study, an online questionnaire (the online survey platform, questionnaire star, <https://www.wjx.cn>) was designed and included demographic data (sex, age, Body Mass Index (BMI)), anorectal disease symptoms after admission to the Jinshan Fangcang Shelter Hospital (bleeding, mass prolapse in the anus, perianal swelling and pain and pain after bowel movements), defecation-related information according to the Constipation Scoring System (CSS), stool type according to the Bristol Stool Form Scale (BSFS) and a Self-rating Anxiety Scale (SAS) [10-12]. All participants were investigated by the online questionnaire before leaving the Jinshan Fangcang Shelter Hospital. The investigation was conducted in an anonymous manner. Before the investigation, all participants were informed of the purpose of the study and their informed consent was obtained.

### Statistical analysis

Statistical Package for Social Sciences (SPSS) (version 26.0) software was used for statistical analysis. The frequency and percentage are presented for categorical variables, which were analyzed by the chi-square test. A P-value less than 0.05 indicated a statistically significant difference.

## RESULTS

A total of 571 questionnaires were received within 7 days of the survey, including 3 invalid questionnaires and 568 valid questionnaires.

**Table 1:** Characteristics of people with anxiety.

Characteristics	All patients (n=452)		Groups		$\chi^2$	P
		Anxiety group (n=111)		Non-anxiety group (n=341)		
Sex (n,%)						
Male	360 (79.6%)	96 (86.5%)		264 (77.4%)	4.247	0.039
Female	92 (20.4%)	15 (13.5%)		77 (22.6%)		
Age (y)						
≤ 30 yrs	104 (23.0%)	20 (18.0%)		84 (24.6%)	2.335	0.311
30-50 yrs	130 (28.8%)	36 (32.4%)		94 (27.6%)		
≥ 50 yrs	218 (48.2%)	55 (49.5%)		163 (47.8%)		

Note:  $\chi^2$ : Defecation rate; P: Pvalue.

**Table 2:** Detection rate of defecation disorders in the anxiety group and non-anxiety group.

Characteristics	All patients (n=452)	Group		$\chi^2$	P
		Anxiety group (n=111)	Non-anxiety group (n=341)		
Defecation disorders	179 (39.6%)	64 (57.7%)	115 (33.7%)	20.054	<0.001
Non-defecation disorders	273 (60.4%)	47 (42.3%)	226 (66.3%)		

Note:  $\chi^2$ : Defecation rate; P: Pvalue.

The effective rate of the questionnaire was 99.65%. A total of 116 questionnaires completed by patients with abnormal defecation before admission to the Jinshan Fangcang Shelter Hospital were excluded. Ultimately, 452 questionnaires were included for data analysis.

### Detection rate of anxiety state

Among the 452 asymptomatic patients, 111 patients reported anxiety, with a detection rate of 24.6% (111/452). Among them, men accounted for 86.5% (96/111) of the anxiety population; the anxiety detection rate of men was significantly higher than that of women, with a statistically significant difference ( $P<0.05$ ) as shown in Table 1. At the age level, there was no significant difference in the detection rate of anxiety among respondents of different ages (Table 1).

### Comparison of the detection rate of defecation disorders between the anxiety and non-anxiety groups

In this investigation, it was found that the detection rate of defecation disorders was 39.6% (179/452). Among patients with defecation disorders, the detection rate in the anxiety group was 57.7% (64/111), which was significantly higher than that of 33.7% (115/341) in the non-anxiety group, ( $P<0.001$ ) (Table 2).

### Characteristics of patients with defecation disorders, fecal types and symptoms of anorectal diseases

The detection rate of defecation disorders was 39.6% (179/452), among which there was no statistically significant difference in the detection rate among different sexes and age groups as shown in Table 3. The analysis of stool type and symptoms of anorectal diseases (bleeding, mass prolapse in the anus, perianal swelling and pain and pain after bowel movements) showed that the proportion of people with difficulty in defecation who reported dry stools (BRISTOL type 1-2), mass prolapse in the anus and perianal swelling and pain was significantly higher than that of those without difficulty in defecation and the difference was statistically significant ( $P<0.05$ ) (Table 3).

**Table 3:** Characteristics of patients with defecation disorders, fecal types and symptoms of anorectal diseases.

Characteristics	All patients (n=452)	Group		$\chi^2$	P
		Defecation disorders group (n=179)	Non-defecation disorders group (n=273)		
Sex (n,%)					
Male	360 (79.6%)	147 (82.1%)	213 (78.0%)	1.122	0.29
Female	92 (20.4%)	32 (17.9%)	60 (22.0%)		
Age (y)					
≤ 30 yrs	104 (23.0%)	42 (23.5%)	62 (22.7%)	0.036	0.982
30-50 yrs	130 (28.8%)	51 (28.5%)	79 (28.9%)		
≥ 50 yrs	218 (48.2%)	86 (48.0%)	132 (48.4%)		
Bristol stool form scale					
1-2 type	80 (17.7%)	43	37	10.72	0.005
3-5 type	298 (65.9%)	115	183		
4-7 type	74 (16.4%)	21	53		
Symptoms of anorectal diseases					
Bleeding	18 (4.0%)	11 (6.1%)	7 (2.6%)	3.626	0.057
Mass prolapses in the anus	6 (1.3%)	6 (3.4%)	0 (0.0%)	9.274	0.002
Perianal swelling and pain	8 (1.8%)	7 (3.9%)	1 (0.4%)	7.812	0.005
	10 (2.2%)	6 (3.4%)	4 (1.5%)	1.014	0.314

Note:  $\chi^2$ : Defecation rate; P: P-value.

## DISCUSSION

At present, the global COVID-19 pandemic is still at a high incidence stage and the use of Fangcang Shelter Hospitals plays a vital role in China's rapid containment of the COVID-19 pandemic. The Fangcang Shelter Hospital, as a designated hospital for the treatment of people with asymptomatic infections, can reduce cross-infection between patients, prevent the spread of the pandemic and reduce the pressure on the medical system. However, the changes in the environment, diet, exercise, psychological state and other factors caused by short-term isolation may cause patients to experience anxiety and defecation changes and induce anorectal diseases. Anorectal disease is a common clinical disease. In a Chinese national epidemiological survey, it was found that there was a significant correlation between the occurrence of anorectal disease (including bloody stool, anal pain, mass prolapse of the anus, etc.) and defecation status and psychological factors among Chinese urban residents [13,14]. The purpose of this study was to observe the psychological status of asymptomatic COVID-19 infected patients in the specific environment of the shelter and its impact on defecation disorders and anorectal diseases, explore optimal management measures and provide a basis for promoting psychological adjustment and anorectal disease management in this special environment.

In this survey, we found that in the specific environment of the

Fangcang Shelter Hospital, the anxiety of the respondents increased and the proportion of the respondents with anxiety who had difficulty defecating significantly increased. In a previous study, it was suggested that the psychological state of anxiety would also cause intestinal motility to slow and induce constipation, resulting in defecation disorders. The results of this study also suggest that the detection rate of defecation disorders in anxious people in short-term shelter isolation was significantly higher than that in non-anxious people.

Some studies suggest that the shelter environment will affect the mental health state of patients infected with the novel coronavirus [15,16]. In this study, it was found that 24.6% (111/452) of the respondents in the shelter had anxiety and other findings were similar to those in this study [16,17].

This study found that for BRISTOL type 1-2 stools, defecation difficulties are more likely to occur, indicating that different stool types can not only reflect the intestinal transit speed but also that BRISTOL type 1-2 stools (more rigid stool) can affect the normal defecation process, causing defecation difficulties [18,19]. In clinical practice, we have always been concerned about the correlation between defecation habits and anorectal diseases. Poor defecation habits may be a risk factor for anorectal diseases and anorectal diseases may lead to changes in defecation habits. In this study, it was found that there was a correlation between defecation difficulty and symptoms of

anorectal diseases (including mass prolapse in the anus and perianal swelling). Patients with defecation difficulties were more likely to have symptoms of mass prolapse in the anus or perianal swelling and pain after defecation. Therefore, it may be necessary to adjust the fecal type and defecation of patients in shelters by providing a reasonable diet structure and increasing the amount of water consumed to reduce the possibility of anorectal diseases.

## CONCLUSION

The Fangcang Shelter Hospital is a special medical environment. Under a specific environment, emotional factors, defecation symptoms and possible anorectal diseases may have a cause and effect relationship. The analysis of this questionnaire indicates that in the management of the shelter, it is necessary to pay attention to the evaluation of the psychological status and defecation of the patients, which can be adjusted through psychological counselling, diet interventions and other methods. The inadequacies of this study are; the observation items for anxiety were relatively simple, the respondents were currently experiencing a sudden change in their living environment and psychological mood fluctuations and the online questionnaire cannot reflect all the psychological states of the respondents. At the same time, in the follow-up study, it is necessary to conduct in-depth and objective explorations on the specific diet, cellulose, drinking water, exercise, toilet environment and other questionnaire contents in shelters.

## CONSENT

Informed consent was obtained from the participants before the investigation. Participation was voluntary.

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