

Fear of progression in patients with mild or common type COVID-19

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Abstract

Aim: To investigate the current condition and degree of fear of disease progression and associated factors in patients with mild or common type COVID-19.

Background: At the end of 2019, COVID-19 spread from Wuhan in Hubei Province throughout China. Confirmed cases and deaths have since been reported in many countries around the world. However, fear of progression in these patients has been poorly explored.

Methods: During February 2020, we recruited 114 patients with mild or common type COVID-19 admitted to a Fangcang shelter hospital. We assessed patients' degree of fear using the simplified Fear of Progression Questionnaire (Chinese version). Multiple regression analysis was applied to explore potential factors.

Results: The fear of disease progression scores of patients with mild or common COVID-19 was at the low-to-moderate level. Current unemployment, disease duration of 28 days or more and not having a spouse diagnosed with COVID-19 were factors potentially associated with fear of progression.

Conclusion: With a high prevalence of fear of disease progression in patients with COVID-19, the risk of psychological effects from the pandemic is significant and fear of progression is one of the manifestations. The need for psychological support services for patients should be included in all pandemic and disaster planning.

KEYWORDS

COVID-19, factors, fear of progression, infection disease, pneumonia

Summary statement

What is already known about this topic?

- Fear of progression is a common bio-socio-psychological consequence that widespread in cancer patients as well as chronic diseases.
- Very few studies focus on fear of progression in patients with major infectious disease, not to mention coronavirus disease (COVID-19).

What this paper adds?

- The present study surveys fear of progression in patients with mild or common type COVID-19 and revealed a low-to-moderate level overall.

- Being unemployed, having no spouse diagnosed with COVID-19, and a disease duration of 28 days or more are potential factors associated to patients' fear of the disease progression.

The implications of this paper:

- The COVID-19 outbreak has been declared as a public health emergency of international concern. Mental health problems such as fear of disease progression might need more attention beyond medical treatment.
- Future mental health nursing practice and research need to focus on those potential factors or patients with specific characteristics.

1 | INTRODUCTION

Since December 2019, an outbreak of coronavirus disease 2019 (COVID-19) has spread globally. Facing this new infectious disease, patients undergoing diagnosis and treatment are likely to experience negative psychological symptoms such as anxiety and fear of disease progression, which might become a significant psychological burden for them. Attention should be paid in compliance with treatment and providing prompt intervention for psychological symptoms (Esser et al., 2019; Goebel & Mehdorn, 2019; Koch et al., 2013). Fear of progression (FoP) is defined as the various bio-socio-psychological consequences or recurrence of the disease brought about by the FoP of the disease (Dankert et al., 2003). It is widespread in patients with cancer and patients with chronic diseases. FoP is a normal psychological reaction and might even be adaptive, however, when FoP exceeds a certain range, and it can affect the patient's disease response, quality of life, or social function (Cheng, Chen, & Zhang, 2019). The national clinical classification of COVID-19 pneumonia is divided into mild, common, severe and critical type according to the newly updated guideline (National Health Commission (NHC) of the People's Republic of China, 2020). The patients diagnosed as mild type might have mild symptoms such as fever and respiratory tract symptoms, but there is no manifestation of pneumonia on the imaging diagnosis, which can be seen in the common type. As for severe or critical type, symptoms like respiratory failure might occur or cases even require monitoring and treatment in the intensive care unit. In an infectious disease outbreak, mounting fear can be aroused in individuals; this is a common phenomenon and can lead to erratic behaviour (Ho et al., 2020). Evidence has shown that even the general public can experience psychological impacts including fear, anxiety and depression during the epidemic (Ahorsu et al., 2020; Wang et al., 2020). However, the psychosocial aspects of COVID-19 have yet to be thoroughly considered. Currently, there is no known information on the FoP of the COVID-19 patients.

Therefore, the purpose of this study was to investigate the current condition and degree of fear of disease progression in patients with mild or common COVID-19 and to analyse its potentially associated factors in order to provide a basis for design of future effective intervention for patients with an excessive fear of disease progression.

2 | METHOD

2.1 | Aim

The aim of the study was to investigate the current condition and degree of FoP and potentially associated factors in patients with mild or common type COVID-19.

2.2 | Study design

A cross-sectional, descriptive design was employed for this study.

2.3 | Setting and sample

We recruited 114 patients with COVID-19 admitted to a Fangcang shelter hospital in Wuhan in February 2020, using the convenience sampling method. Fangcang shelter hospitals were large-scale, temporary hospitals, rapidly built by converting existing public venues, such as stadiums and exhibition centres, into health-care facilities. They served to isolate patients with mild or common type COVID-19 from their families and communities whilst providing medical care, disease monitoring, food, shelter and social activities (Chen, Zhang, et al., 2020). All patients agreed to participate in this survey. Inclusion criteria were as follows: age 18–65 years; clinical classification of mild or common COVID-19 in accordance with relevant national diagnostic and therapeutic norms and in line with confirmed cases of COVID-19; and voluntary participation in this study and ability to cooperate. Exclusion criteria were cognitive impairment or mental illness, severe visual, hearing or speech disorders.

2.4 | Data collection

We set up the questionnaire in an online electronic version. We set up a quality control mode, designed a logical range for measurement data (such as age and disease duration) and required completion of all questions. One of the investigators of this study trained other

investigators on site before the survey was conducted. The investigators screened patients strictly in accordance with the inclusion and exclusion criteria. After providing the informed consent, the patients scanned a QR code to access the survey and answered anonymously using their own device. The questionnaire could be submitted when all questions were completed and if it met quality control criteria.

2.5 | Measures

2.5.1 | General information questionnaire

The general information questionnaire was designed by the researchers and included age, gender, marital status, occupational status, educational level, place of residence, course of illness, and whether relatives and friends were sick.

2.5.2 | Fear of progression questionnaire-short form (FoP-Q-SF)

The FoP-Q-SF was compiled by Mehnert et al. (2006) on the basis of the FoP-Q, which was translated in Chinese by Wu et al. (2015). The Chinese version was developed by direct translation and back translation by two researchers and was reviewed and culturally adjusted by a panel of experts. A total of 678 patients with primary liver cancer were recruited and were investigated using the Chinese version of FoP-Q-SF. Exploratory factor analysis indicated that Chinese version of FoP-Q-SF consisted of two factors which explained 53.8% of the total variance, and factor loading of all 12 items was higher than 0.4. Confirmatory factor analysis indicated that the fit indices of the measurement were improved. The internal consistency reliability coefficients were 0.883 for total scale, and 0.829 and 0.812 for the two factors, respectively (Wu et al., 2015).

The scale is a 12-item self-assessment scale, divided into two dimensions of physical health and social family, each with six items. The items are rated on a 5-point Likert scale from 1 to 5, with options of 'never', 'rarely', 'sometimes', 'often', and 'always'. The total score ranges from 12 to 60 points; the higher the score, the more severe the FoP. A cutoff total score of 34 has been derived as the dysfunctional FoP level, which indicates there might be a psychological dysfunction related to fear of disease progression. Cronbach's α coefficient of the present Chinese version was 0.883, indicating good internal consistency.

2.6 | Ethical considerations

The participants were informed of the study aim, and informed consents were obtained when the participants were recruited. The patients filled in and submitted the questionnaires online voluntarily. This cross-sectional study was conducted in the early stage of implementation of Fangcang shelter hospitals in Wuhan. After

carefully reviewing the full protocol and consulting relevant psychologists, we thought it would not change or aggravate the patient's psychological disorder. Thus, no formal Ethics Committee approval was required.

2.7 | Data analysis

The data were entered into EpiData 3.0 (The EpiData Association, Odense, Denmark) by two people, checked for errors, and analysed using SPSS 17.0 statistical software. Measurement data conforming to the normal distribution were expressed as mean \pm standard deviation and analysed by a *t* test. Count data were expressed as percentages and analysed by a chi-square test. Receiver operating characteristic curve area under the curve (AUC) was used to dichotomize potential factors. These factors were analysed by binary logistic stepwise regression. The difference was statistically significant at $P < 0.05$.

3 | RESULTS

3.1 | Current status of FoP

A total of 114 questionnaires were collected in this study, with an effective rate of 100%. There were 51 males and 63 females, aged 45.11 ± 11.43 years. The average total scores were 27.98 ± 10.15 for fear of disease progression; of these, 14.27 ± 5.47 were for the social family dimension, and 13.71 ± 5.22 for the physical health dimension. We ranked the scores of each item of patients' fear of disease progression and found that the item with the highest score was 'Fearing that the disease will be transmitted to my family, especially children' (Table 1).

3.2 | Comparison of patients with different levels of FoP

A total of 36 (31.6%) patients had a fear of disease progression score of ≥ 34 points. Based on this cutoff point, the patients were divided into the high-level FoP group (≥ 34 points) and normal-level FoP

TABLE 1 The five items with the highest scores for fear of disease progression ($N = 114$)

Items	$M \pm SD$
Being afraid of the possibility that my family members could contract the disease, especially children	3.25 ± 1.46
Worrying that medications could damage my body	2.68 ± 1.20
Worrying about what will become of my family	2.68 ± 1.19
Being afraid of disease progression	2.49 ± 1.11
Being afraid of becoming less productive at work	2.40 ± 1.20

group (< 34 points). The patients with high-level FoP were more likely to be female and to have a disease duration of 28 days or more, less likely to have a spouse diagnosed with COVID-19 (Table 2).

3.3 | Potential factors associated to FoP

According to the results of univariate analysis, a single factor with $P < 0.10$ was selected for entry into logistic regression analysis, which included five variables: gender, occupational status, whether a spouse was diagnosed with COVID-19, duration of disease and hospital stay in Fangcang shelter hospital. AUC was used to determine the optimal cutoff time for the duration of illness and length of stay in the Fangcang shelter hospital, which was 28 days (AUC = 0.638) and 17 days (AUC = 0.608), respectively; these two continuous variables were transformed into two categorical variables according to the optimal

cutoff. Binary logistic stepwise regression analysis was used to establish the model. The factors that were ultimately retained in the model were occupational status, whether a spouse was diagnosed with COVID-19, and duration of disease. The Hosmer–Lemeshow goodness-of-fit test indicated that $\chi^2 = 2.150$, $P = 0.828$, and the AUC value was 0.738 (Table 3).

4 | DISCUSSION

Fear, tension, pessimism and suspicion are common psychological reactions of patients with infectious diseases (Huang et al., 2014). The results of this study showed that fear of disease progression in patients with mild or common COVID-19 was at the low-to-moderate level, with 30% of patients having a clinically significant level of FoP indicating psychological dysfunction. This fear might

TABLE 2 Comparison of characteristics of patients with different levels of fear of progression ($N = 114$)

Variable	Normal-level FoP group ($n = 78$)	High-level FoP group ($n = 36$)	Statistics	P
Age (years, $M \pm SD$)	44.91 \pm 11.17	45.56 \pm 12.13	$t = -0.279$	0.781
Gender ($n, \%$)			$\chi^2 = 4.280$	0.039
Male	40 (51.3%)	11 (30.6%)		
Female	38 (48.7%)	25 (69.4%)		
Marital status ($n, \%$)			$\chi^2 = 1.117$	0.572
Single	11 (14.1%)	4 (11.1%)		
Married	64 (82.1%)	29 (80.6%)		
Divorced/separated/widowed	3 (3.8%)	3 (8.3%)		
Place of residence ($n, \%$)			$\chi^2 = 0.059$	0.807
City/town	72 (92.3%)	32 (88.9%)		
Country	6 (7.7%)	4 (11.1%)		
Occupation ($n, \%$)			$\chi^2 = 3.376$	0.066
Full-time/part-time/homemaker	51 (65.4%)	17 (47.2%)		
Current unemployed (retired/no job)	27 (34.6%)	19 (52.8%)		
Education ($n, \%$)			$\chi^2 = 3.391$	0.495
Primary education	3 (3.8%)	2 (5.6%)		
Secondary education	24 (30.8%)	16 (44.4%)		
Associate degree	22 (28.2%)	10 (27.8%)		
Bachelor's degree	23 (29.5%)	7 (19.4%)		
Postgraduate education	6 (7.7%)	1 (2.8%)		
Course of disease (days, $M \pm SD$)				
Time since onset	26.13 \pm 11.11	30.78 \pm 8.42	$t = -2.468$	0.016
Time since diagnosed	16.77 \pm 8.79	18.97 \pm 8.63	$t = -1.251$	0.214
Length of stay in Fangcang hospital	12.41 \pm 5.76	14.50 \pm 5.82	$t = -1.794$	0.075
Any diagnosed intimate people ($n, \%$)				
Spouse	27 (34.6%)	5 (13.9%)	$\chi^2 = 5.241$	0.022
Children	9 (11.5%)	5 (13.9%)	$\chi^2 = 0.002$	0.961
Parents	19 (24.4%)	13 (36.1%)	$\chi^2 = 1.685$	0.194
Relatives	10 (12.8%)	7 (19.4%)	$\chi^2 = 0.852$	0.356
Friends	29 (37.2%)	16 (44.4%)	$\chi^2 = 0.544$	0.461

TABLE 3 Analysis of potential factors associated to fear of progression in patients with COVID-19

Factors	B	SE	Wald	df	P	OR	95% CI
Currently unemployed (retired/no job)	1.181	0.468	6.365	1	0.012	3.257	1.301, 8.153
No spouse diagnosed with COVID-19	1.492	0.583	6.550	1	0.010	4.445	1.418, 13.931
Duration of COVID-19 of 28 days or longer	1.408	0.502	7.884	1	0.005	4.089	1.530, 10.926
Constant	-4.801	1.441	11.104	1	0.001	0.008	-

affect the short-term and long-term clinical outcomes of patients and cause some distress to the patients upon their return to society and family. It is also an important factor related to the overall success in battling the epidemic, and it should receive more attention from medical workers.

COVID-19 is a new type of infectious diseases with respiratory droplets and close contact transmission as the main transmission route. Its pathogenesis, incubation period and treatment methods are still in the exploratory stage, both in scientific research and in clinical practice, and many questions remain to be clarified. This sense of uncertainty about the disease might cause patients to fear disease progression (Parker et al., 2016). Several existing studies demonstrated that those who have been exposed to the risk of infection might develop pervasive fears about their health, worries about infecting others and fearing infecting family members (Serafini et al., 2020). Social media have reported extensively on the epidemic, including some cases with repeated courses of illness and negative presentations of rehabilitated patients returning to society. Negative information overload and role substitution might aggravate patients' fear of their own disease progression to some extent (Tang et al., 2018; Yang et al., 2018). Chen's study revealed that there was a high prevalence of fear of disease progression, anxiety and depression in patients with cancer after the outbreak of COVID-19, which was much higher than the results obtained from general populations and patients with cancer in times without an epidemic (Chen, Wu, et al., 2020).

High-level FoP patients might have higher psychological care needs, and it is necessary to screen the high-level FoP patients for intervention (Cheng, Zhang, & Chen, 2019). The prerequisite for effective intervention is a deep understanding of the independent factors impacting COVID-19 patients' fear of disease progression. The results of univariate analysis showed that the degree of fear of female patients was significantly higher than that of men, but this significant difference was eliminated after regression analysis, suggesting that the fear of disease progression is gender neutral. The results of this study showed that being unemployed, not having a spouse diagnosed with COVID-19 and duration of COVID-19 of 28 days or more are independent factors of FoP. The persistence of the disease causes patients to pay more attention to the progression of the disease, consistent with the previous studies (Koch et al., 2013). In addition, the patients with mild or common COVID-19 are mostly admitted to Fangcang shelter hospitals, and all relatives and friends are prohibited from visiting. A long period of isolation might increase fear. We found that 28 days (4 weeks) might be a time point at which patients begin

to perceive more fear, suggesting that medical staff should pay extra attention to patients who have had the disease for more than 28 days.

We found that the fear of disease progression in patients with COVID-19 has a certain uniqueness as they scored higher on the social family dimension than on the physical health dimension, which is different from findings in patients with cancer (Cheng, Zhang, Chen, Xu, & Chen, 2019). The three independent factors revealed in this study include two social family-related factors. In China, personal burdens are mainly relieved with medical expenses of patients with COVID-19 paid through basic medical insurance, critical illness insurance or medical assistance. However, the patients who do not have a job and who did not have a job before they were infected might be under higher financial pressure, thus showing a greater concern about the progression of the disease. In addition, mutual support among family members can also affect people's response to disease and psychological threats. The World Health Organization has classified patients and their caregivers as a category of people that need protection. The mutual support and effective stress coping styles of patients and their spouses in the face of disease threats and various challenges have a positive effect on reducing the level of fear of disease progression (Li et al., 2019). During the present epidemic, if patients have a spouse who is also diagnosed with COVID-19, active communication between patients and their spouse might provide a psychological channel to help each other rationally face the fear of disease progression, thus explaining the lack of an infected spouse as a fear factor. This finding also suggests that health-care professionals should consider patient spouses as an important source of psychological support when designing targeted FoP interventions.

The COVID-19 pandemic is still a public health event of high global concern at the time of writing. At present, the focus of most countries is on controlling and mitigating the impact of this pandemic by testing and treating infected patients, developing vaccines and drugs. Psychologists have expressed their increasing concerns over the pandemic's mental health and psycho-social consequences. This study revealed that there is a high prevalence of fear of disease progression in patients with COVID-19. The findings of this study address the mental health crisis amid the global pandemic and emphasize the need for hospitals worldwide to adopt new strategies to improve psychological services to minimize patients' fear of disease progression. Appropriate and personalized psychological intervention is in urgent need, especially for patients with potential factors.

4.1 | Limitations

There are several limitations in this study. Firstly, this was a cross-sectional design that prevents drawing conclusions about causality. The cause–effect relationships between potential factors and fear of disease progression could not be verified by our study. A longitudinal study design to test cause–effect relationships was suggested. Secondly, we only recruited patients with mild or common type of COVID-19. Thus, whether the findings can represent severe-type COVID-19 are unknown. Additionally, the small sample size of this study might limit the generalizability to some extent. However, this survey was conducted in a typical Fangcang shelter hospital in Wuhan during the outbreak period of COVID-19, and findings might be relevant and significant to help other regions deal with the outbreak.

5 | CONCLUSION

The risk of psychological effects from the COVID-19 pandemic is significant and FoP is one of the manifestations. The need for psychological support services for patients should be included in all pandemic and disaster planning. Registered nurses, whether in hospital, the community or in primary care, have been recognized worldwide as frontline warriors working hard to stem suffering, infection rates and deaths during the COVID-19 pandemic. They play a key role in the public health response to such crises, delivering direct patient care and relieving the psychological burden of disease on patients. In this paper, we uncovered several potential factors associated with patients' FoP. Further studies might focus on cultural differences on this topic, and targeted psychological monitoring and intervention accordingly.

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CONFLICT OF INTEREST

The authors have no competing interests to report.

AUTHORSHIP STATEMENT

Ding S conceived the study and analysed the data. Dong L and Chen L did the data collection. Ding S and Dong L finished the manuscript writing. Gao FL takes responsibility for the paper as a whole. Ding S and Dong L contribute equally to this manuscript. The authors confirm that all listed authors meet the authorship criteria and that all authors are in agreement with the content of the manuscript.

Ding S conceptualized and designed the study, carried out the statistical analyses and the interpretation of the data, drafted the initial manuscript and approved the final manuscript as submitted.

Dong L supported data collection, as well as the interpretation of the data, drafted parts of the manuscript, critically reviewed the manuscript and approved the final manuscript as submitted.

Chen L supported data collection, critically reviewed the manuscript and approved the final manuscript as submitted.

Gao FL gave guidance for the concept of the study, critically reviewed the manuscript and approved the final manuscript as submitted.

Ding S and Dong L contribute equally to this manuscript.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no datasets were generated or analysed during the current study.

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