

## PSYCHOLOGICAL CHARACTERISTICS OF PATIENTS WITH COVID-19 ASSOCIATED PNEUMONIA

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**Introduction.** Patients with COVID-19 often face a wide range of psychological features that can persist for a long time after the acute phase of the disease. Numerous studies have shown an increased prevalence of mental disorders among people with COVID-19 compared to the general population or patients with other respiratory diseases.

**The aim of the study** – to analyse the level of optimism/pessimism among patients with COVID-19 pneumonia depending on the category of disease severity.

**The main part.** The first stage of our study was a retrospective examination of the medical records of 27 patients who were hospitalized for community-acquired pneumonia (confirmed by computed tomography) with a positive smear test result for SARS-CoV-2 virus. The severity of pneumonia was calculated using the PORT scale. The second stage of our study was a telephone survey to assess the level of optimism of the participants of the first stage of our study 6-12 months after discharge from the hospital, using The Life Orientation Test-Revised.

Assessment of the level of optimism in patients with COVID-19-associated pneumonia shows a decrease in its level with an increase in the category of pneumonia complexity. At the same time, in group III, the level of optimism was significantly lower by 26.2 % compared with the comparison group. It is worth noting a significant increase in the percentage of people with high pessimism and, accordingly, a decrease in the percentage of people with high optimism as COVID-19-associated pneumonia progresses. The analysis of optimism components showed the vast majority of positive responses to the statement 'In uncertain times, I usually expect the best' in group II (92.31 %) and group III (71.42 %) and the largest number of negative responses to the statement 'I'm always optimistic about my future' in group III (50.00 %). The analysis of pessimism components showed the vast majority of affirmative responses to the statements 'I hardly ever expect things to go my way' (78.56 %), 'I rarely count on good things happening to me' (71.94 %) in group III patients, which, however, did not significantly differ from the data in group II patients.

**Conclusions.** Understanding psychological characteristics is critical to developing effective diagnostic, treatment and rehabilitation strategies aimed at improving the mental health and quality of life of individuals after COVID-19-associated pneumonia.

**Key words:** COVID-19; pneumonia; mental disorders; optimism; pessimism.

## ПСИХОЛОГІЧНА ХАРАКТЕРИСТИКА ХВОРИХ, ЯКІ ПЕРЕНЕСЛИ ПНЕВМОНІЮ, АСОЦІЙОВАНУ З COVID-19

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**Вступ.** Пацієнти з COVID-19 часто стикаються із широким спектром психологічних особливостей, які можуть зберігатися протягом тривалого часу після гострої фази захворювання. Численні дослідження показали підвищену поширеність психічних розладів серед людей, хворих на COVID-19, порівняно із загальною популяцією або пацієнтами з іншими респіраторними захворюваннями.

**Мета роботи** – проаналізувати рівень оптимізму/песимізму у хворих на пневмонію, спричинену COVID-19, залежно від категорії тяжкості захворювання.

**Основна частина.** Першим етапом нашого дослідження було ретроспективне вивчення медичної документації 27 пацієнтів, яких госпіталізували з приводу негоспітальної пневмонії (підтвердженої за допомогою комп'ютерної томографії) з позитивним результатом мазка на вірус SARS-CoV-2. Тяжкість перебігу пневмонії оцінювали за шкалою PORT. Другим етапом нашого дослідження було телефонне опитування для оцінки рівня оптимізму в учасників першого етапу дослідження через 6–12 місяців після виписування зі стаціонару за допомогою тесту життєвої орієнтації (The Life Orientation Test-Revised).

Оцінка рівня оптимізму у хворих на пневмонію, асоційовану з COVID-19, свідчить про його зниження зі збільшенням категорії тяжкості пневмонії. При цьому в 3-й групі рівень оптимізму був вірогідно нижчим на 26,2 % порівняно з групою порівняння. Варто відзначити значне збільшення відсотка осіб з високим рівнем песимізму і, відповідно, зменшення відсотка осіб з високим рівнем оптимізму в міру прогресування пневмонії, асоційованої з COVID-19. Аналіз компонентів оптимізму показав переважання позитивних відповідей на твердження «У непевні часи я зазвичай очікую на краще» у хворих 2-ї (92,31 %) і 3-ї (71,42 %) груп та найбільшу кількість негативних відповідей на твердження «Я завжди оптимістично дивлюся на своє майбутнє» у пацієнтів 3-ї групи (50,00 %). Аналіз компонентів песимізму показав переважання ствердних відповідей на твердження «Я майже ніколи не очікую, що все піде по-моєму» (78,56 %), «Я рідко розраховую на те, що зі мною трапиться щось хороше» (71,94 %) у хворих 3-ї групи, що, втім, достовірно не відрізнялося від даних у пацієнтів 2-ї групи.

**Висновки.** Розуміння психологічних особливостей є критично важливим для розробки ефективних діагностичних, лікувальних і реабілітаційних стратегій, спрямованих на покращення психічного здоров'я та якості життя осіб після перенесення пневмонії, асоційованої з COVID-19.

**Ключові слова:** COVID-19; пневмонія; психічні розлади; оптимізм; песимізм.

**Introduction.** The COVID-19 pandemic caused by the SARS-CoV-2 virus first detected in late 2019 in Wuhan, China, and has had a devastating impact on global health, going beyond physical symptoms and causing significant psychological consequences. The initial spread of the virus and China's subsequent response to the global crisis have generated considerable interest and debate in the global scientific and policy community [1, 2].

Patients with COVID-19 often face a wide range of psychological features that can persist for a long time after the acute phase of the disease. Numerous studies have shown an increased prevalence of mental disorders among people with COVID-19 compared to the general population or patients with other respiratory diseases. Meta-analyses show that the prevalence of depression and anxiety in patients after COVID-19 can range from 15 % to 40 % or more, depending on the study methodology, follow-up time and severity of the disease [3–6]. Review focusing on Chinese older adults found the prevalence of depressive symptoms to be around 27 % in COVID-19 patients and anxiety symptoms at 14 %. For the general older adult population, these figures were 26 % and 23 % respectively [6]. Another systematic review found pooled prevalence rates of anxiety and depression among Chinese healthcare workers to be 17 % and 15 % for moderate to severe symptoms, and 37 % and 39 % for mild to severe symptoms, respectively [7]. Thus, the psychological changes observed in Chinese patients after COVID-19 are extensive and diverse, ranging from common mood and anxiety disorders to more severe conditions like posttraumatic stress disorders and cognitive impairments.

Therefore, the aim of our study was to analyze the level of optimism/pessimism among patients with

COVID-19 pneumonia depending on the category of disease severity.

**The main part.** The first stage of our study was a retrospective examination of the medical records of 27 patients who were hospitalized for community-acquired pneumonia (confirmed by computed tomography) with a positive smear test result for SARS-CoV-2 virus. Patients were divided into three groups according to the severity of pneumonia: Group II – patients with pneumonia of category 2 severity (n=13), Group III – patients with pneumonia of category 3 severity (n=14). The comparison group (group I) consisted of patients (n=19) with diagnosed pneumonia and a negative smear test result for SARS-CoV-2 virus. The severity of pneumonia was calculated using the PORT scale [8]. The second stage of our study was a telephone survey to assess the level of optimism of the participants of the first stage of our study 6-12 months after discharge from the hospital. The Life Orientation Test-Revised (LOT-R) is a widely used and respected psychological instrument for measuring dispositional optimism, which refers to a general tendency to expect positive outcomes in the future. It was developed by Michael Scheier, Charles Carver, and Michael Bridges in 1994, as a revision of their earlier Life Orientation Test (LOT). Common LOT-R Items (Note: Specific wording can vary slightly, but the core meaning is similar):

1. In uncertain times, I usually expect the best. (Optimism)
2. It's easy for me to relax. (Filler)
3. If something can go wrong for me, it will. (Pessimism – Reverse-scored)
4. I'm always optimistic about my future. (Optimism)
5. I enjoy my friends a lot. (Filler)
6. It's important for me to keep busy. (Filler)

7. I hardly ever expect things to go my way.  
(Pessimism – Reverse-scored)

8. I don't get upset too easily. (Filler)

9. I rarely count on good things happening to me.  
(Pessimism – Reverse-scored)

10. Overall, I expect more good things to happen to me than bad. (Optimism)

Higher scores on the LOT-R indicate higher levels of dispositional optimism, while lower scores suggest higher levels of pessimism.

The general interpretation guide for the total score (0-24) include:

0 – 13: low optimism (or high pessimism): individuals in this range tend to have a more pessimistic outlook. They may frequently anticipate negative outcomes, dwell on potential failures, and might feel less in control of their future. This can be associated with increased vulnerability to stress, anxiety, and depression.

14 – 18: moderate optimism (or balanced outlook): This range suggests a more balanced or realistic perspective. Individuals here may have a generally positive outlook but also acknowledge potential challenges. They are not at the extreme ends of optimism or pessimism. This can be a healthy middle ground, indicating adaptability.

19 – 24: high optimism (or low pessimism): Individuals with scores in this range tend to be highly optimistic. They generally expect positive outcomes, believe in their ability to cope with difficulties, and view challenges as opportunities for growth. High optimism is often linked to greater resilience, better coping mechanisms, higher life satisfaction, and potentially better physical health outcomes.

Statistical analysis of the data was performed using STATISTICA 7.0 software. Absolute values are presented as the mean (Mean) and its standard deviation (SD). The comparison of relative values, which were presented

in the form of a percentage ratio, was carried out using the Pearson's test. The difference was considered statistically significant at  $p < 0.05$ .

Assessment of the level of optimism in patients with COVID-19-associated pneumonia shows a decrease in its level with an increase in the category of pneumonia complexity (Table 1). At the same time, in group III, the level of optimism was significantly lower by 26.2 % compared with the comparison group I. It is worth noting a significant increase in the percentage of people with high pessimism and, accordingly, a decrease in the percentage of people with high optimism as COVID-19-associated pneumonia progresses.

**Table 1. Characteristics of dispositional optimism in patients with community-acquired pneumonia**

| Group             | Total Score  | Low Optimism (or High Pessimism) | Moderate Optimism (or Balanced Outlook) | High Optimism (or Low Pessimism) |
|-------------------|--------------|----------------------------------|---|----------------------------------|
| I <sup>st</sup>   | 18.54 ± 3.62 | 0                                | 8 (42.1 %)                              | 11 (57.9 %)                      |
| II <sup>nd</sup>  | 16.39 ± 2.78 | 3 (23.1 %)                       | 6 (48.1 %)                              | 4 (30.8 %)                       |
| III <sup>rd</sup> | 13.69 ± 3.78 | 8 (57.1 %)                       | 4 (28.6 %)                              | 2 (14.3 %)                       |
| p                 | p=0.031*     | $\chi^2=11.07$ ; p=0.023*        |   |                                  |

Note. \* – statistical significance.

The analysis of optimism components showed the vast majority of positive responses to the statement 'In uncertain times, I usually expect the best' in group II (92.31%) and group III (71.42 %) and the largest number of negative responses to the statement 'I'm always optimistic about my future' in group III (50.00 %) (Table 2).

**Table 2. Assessment of the level of optimism in patients with community-acquired pneumonia**

| Question  | Group             | Strongly Disagree | Disagree    | Neutral     | Agree       | Strongly Agree |
|---|-------------------|-------------------|-------------|-------------|-------------|----------------|
| 1. In uncertain times, I usually expect the best                | II <sup>nd</sup>  | –                 | –           | 1 (7.69 %)  | 7 (53.85 %) | 5 (38.46 %)    |
|   | III <sup>rd</sup> | –                 | 2 (14.29 %) | 2 (14.29 %) | 6 (42.86 %) | 4 (28.56 %)    |
| 4. I'm always optimistic about my future                        | II <sup>nd</sup>  | –                 | 2 (15.38%)  | 7 (53.85 %) | 4 (30.77 %) | –              |
|   | III <sup>rd</sup> | –                 | 7 (50.00 %) | 4 (28.56 %) | 3 (21.44 %) | –              |
| 10. Overall, I expect more good things to happen to me than bad | II <sup>nd</sup>  | –                 | 2 (15.38 %) | 4 (30.78 %) | 5 (38.56 %) | 2 (15.38 %)    |
|   | III <sup>rd</sup> | –                 | 6 (42.86 %) | 6 (42.86 %) | 2 (14.28 %) |                |

Note 1. For question 1:  $\chi^2=5.72$ ,  $p = 0.122$ .

Note 2. For question 4:  $\chi^2=7.18$ ,  $p = 0.084$ .

Note 3. For question 10:  $\chi^2=4.28$ ,  $p = 0.237$ .

The analysis of pessimism components showed the vast majority of affirmative responses to the statements 'I hardly ever expect things to go my way' (78.56 %), 'I rarely count on good things happening to

me' (71.94 %) in group III patients, which, however, did not significantly differ from the data in group II patients (Table 3).

**Table 3. Assessment of the level of pessimism in patients with community-acquired pneumonia**

| Question   | Group             | Strongly Disagree | Disagree    | Neutral     | Agree       | Strongly Agree |
|--|-------------------|-------------------|-------------|-------------|-------------|----------------|
| 3. If something can go wrong for me, it will     | II <sup>nd</sup>  | 3 (23.07 %)       | 7 (53.85 %) | 2 (15.38 %) | 1 (7.70 %)  | –              |
|  | III <sup>rd</sup> |                   | 2 (14.32 %) | 4 (28.56 %) | 4 (28.56 %) | 4 (28.56 %)    |
| 7. I hardly ever expect things to go my way      | II <sup>nd</sup>  | 3 (23.07 %)       | 4 (30.77 %) | 6 (46.16 %) |             | –              |
|  | III <sup>rd</sup> |                   |             | 3 (21.44 %) | 7 (50.00 %) | 4 (28.56 %)    |
| 9. I rarely count on good things happening to me | II <sup>nd</sup>  |                   | 3 (22.90 %) | 5 (38.55 %) | 5 (38.55 %) | –              |
|  | III <sup>rd</sup> |                   |             | 4 (28.56 %) | 7 (50.00 %) | 3 (21.44 %)    |

Note 1. For question 3:  $\chi^2=8.22$ ,  $p = 0.057$ .

Note 2. For question 7:  $\chi^2=5.24$ ,  $p = 0.227$ .

Note 3. For question 9:  $\chi^2=4.72$ ,  $p = 0.328$ .

These findings suggest that the physical toll of COVID-19-associated pneumonia has a profound psychological impact, leading to a diminished sense of optimism and a heightened tendency towards pessimism, especially as the disease progresses in severity [3–5]. This underscores the need for psychological support tailored to the severity of the illness, addressing the emotional and cognitive burdens that accompany the physical challenges of COVID-19 pneumonia [9, 10].

**Conclusions.** Patients who have experienced COVID-19 are at significant risk for developing a

wide range of psychological features, including low optimism (or high pessimism), which progresses as the severity of the pneumonia increases. These outcomes are the result of a complex interaction of biological, psychological and social factors, exacerbated by additional stressors such as the war in Ukraine. Understanding these characteristics is critical to developing effective diagnostic, treatment and rehabilitation strategies aimed at improving the mental health and quality of life of individuals after COVID-19-associated pneumonia.

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