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Review article

Physical and Mental Health Problems in Post-COVID Patients

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Abstract

This review analyzed the results of 8 meta-analyses and systematic reviews that assessed the quality of life of patients who have had COVID-19.

In patients with acute COVID-19 who were in intensive care units, quality of life is significantly lower than in patients with a long course of coronavirus infection. Decreases in HRQoL in COVID-19 survivors are most commonly associated with long-term manifestations of the disease, such as fatigue, shortness of breath, anosmia, sleep disturbances, and worsen mental health.

There are significant differences in HRQoL among COVID-19 survivors based on gender, age, disease severity, and study country. COVID-19 affects the HRQoL of women, patients with severe comorbidities, and patients over the age of 60, especially in patients from low-income countries. The long-term impact of COVID-19 on patients' HRQoL is still in the early stages of investigation.

The results of this review led us to conclude that the EQ-5D-5L is an effective tool for assessing HRQoL in post-COVID-19 patients.

Key words: coronavirus infection, COVID-19, health-related quality of life, post-coronavirus disease.

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Introduction

The coronavirus disease COVID-19 pandemic caused by severe acute respiratory disease coronavirus 2 (SARS-CoV-2) has resulted in millions of cases and deaths worldwide [1-3]. As of May 1, 2022, there have been over 500 million confirmed cases worldwide and over six million deaths [4]. Most often, the disease proceeds in a mild form, however, there is a noticeable number of severe cases. A significant number of people continue to describe ongoing symptoms long after acute phase of COVID-19, often referred to as Long-term COVID-19 [5].

Currently, the world is widely discussing the impact of COVID-19 on the human body, Post-coronavirus disease and other consequences of this infection [6-8]. On the other hand, various restrictions due to pandemic have had a negative impact on the mental health of population. These indicators can negatively affect to the quality of patients' life, especially among the working-age population, which, in turn, can have significant impact on the global healthcare system [8].

Health-Related Quality of Life (HRQoL) is currently an important indicator that is used to assess the impact of a previous coronavirus infection on the physical, mental and social

Methodology

In order to study, we searched the bibliographic databases of Pubmed, Science Direct, LitCovid, bioRxiv, medRxiv, Google Scholar, as well as on the official WHO website, using the following keywords: coronavirus; COVID-19; Health-Related Quality of Life.

We worked on the principle of evidence-based medicine: from the most convincing to the least, and the first stage of our study included an analysis of the results of systematic reviews and meta-analyses published on the relevant topics.

Literature selection criteria: meta-analyses and systematic reviews, as well as the results of studies aimed at

Main part

We noticed that many authors divided participants into two categories of patients: the first - patients who had an acute course of COVID-19 and duration of the course is up to 4 weeks from the onset of symptoms; the latter have a long course, from 4 to 12 weeks or more from the onset of symptoms of coronavirus infection [6-8,10].

health of patients. HRQoL assessment can help health care system focus on factors that affect a quality of patients' life, as well as recognize aspects of COVID-19 management for further optimization. In short, the study of HRQOL allows you to identify factors that contribute to improve life and make sense [9,10].

Thus, the study of HRQoL in people who have had a coronavirus infection will allow the healthcare system to effectively plan measures to improve public health indicators, minimize costs by increasing the literacy of the population to improve their own health.

Our goal is to study degree of COVID-19 impact on the health-related quality of life in people.

Our secondary goal was to evaluate the effectiveness of the EuroQol 5-Dimensional - 5-Level (EQ-5D-5L) questionnaire for further use in our study as part of a master's thesis.

studying HRQoL in patients over 18 years old who had coronavirus infection (after discharge from the hospital and recovered), using reliable HRQoL measurement tools such as EQ-5D and SF-36. Incomplete texts of studies, short communications, review articles, reports, etc. were excluded.

Total of 43 publications were selected. Further, after selection we selected 8 Meta-Analysis and Systematic Reviews in accordance with the criteria.

We presented HRQoL scores as well as an overview of factors that influence HRQoL in post-COVID-19 patients from several meta-analyses and systematic reviews (Table 1).

Table 1 – Review of past meta-analyses and systematic reviews aimed at assessing the HRQoL of people who have had COVID-19

No	Authors, year	Number of studies and total number of respondents	Tool	HRQoL indicators, factors affecting HRQoL
1	Malik P. et al., 2022 [9]	12 studies; 4828 participants	EQ-5D-5L	41.5% of patients had pain/discomfort, 37.5% had anxiety/depression, 36% had problems with mobility, 28% had problems with normal activities, and 8% of patients had problems with self-care
2	Poudel A.N. et al., 2021 [10]	12 studies, 6326 patients	EQ-5D-5L, SF-36 и др.	COVID-19 significantly affects HRQoL in both acute and long-term patients. However, the lowest HRQoL scores are seen in patients with acute COVID, women, elder people, patients with more severe disease, and patients from low-income countries
3	Willi S. et al., 2021 [11]	31 studies	EQ-5D-5L, medical documentation, etc.	Persistence of the consequences of coronavirus infection in people over the age of 50 lasted from 14 days to 3 months from the moment of infection. Consequences included persistent fatigue (39-73% of examined people), shortness of breath (39-74%), reduced quality of life (44-69%), impaired lung function, abnormal CT findings including pulmonary fibrosis (39-83%), signs peri-perimio-/myocarditis (3-26%), changes in the microstructural and functional integrity of the brain with persistent neurological symptoms (55%), an increase in the frequency of psychiatric diagnoses (5.8% versus 2.5-3.4% in control), incomplete recovery of olfactory and gustatory dysfunction (33-36% of examined people)
4	Ariyo K. et al., 2021 [12]	2536 studies, 22 were included for systematic review and 18-for meta-analysis (2326 patients)	EQ-5D-5L	The HRQoL of older patient survivors was significantly worse than that of younger ICU survivors, with small and middle effect sizes (d = 0.35 (-0.53 and -0.16))

Table continuation – Review of past meta-analyses and systematic reviews aimed at assessing the HRQoL of people who have had COVID-19

№	Authors, year	Number of studies and total number of respondents	Tool	HRQoL indicators, factors affecting HRQoL
5	Dorri M. et al., 2021 [13]	21 studies	EQ-5D-5L, SF-36, SGRQ, WHOQOL-BREF	Survivors of COVID-19 patients have low HRQoL and social role within one month. Psychological distress, including post-traumatic stress disorder, depression, and anxiety, is to be expected in most of these patients
6	Michelen M. et al., 2021 [14]	39 studies, 10951 patients		Total of 37% (95% CI 18% to 60%) of patients reported a decrease in quality of life. More than 60 physical and psychological signs and symptoms were reported with a wide prevalence, most commonly weakness (41%), general malaise (33%), fatigue (31%), impaired concentration (26%) and shortness of breath (25%). Only 26% (10/39) of studies provided evidence of decreased lung function
7	Rogers J.P., 2020 [15]	2050 studies, 4942 patients	medical data	In the post-illness stage, depressive mood occurred in 10.5% of 332 patients, insomnia in 12.1%, and anxiety in 12.3% of 171 patients). A meta-analysis showed that at the post-illness stage, the point prevalence of post-traumatic stress disorder was 32.2% (out of 402 cases from four studies), the point prevalence of depression was 14.9% (out of 517 cases from five studies), anxiety disorders - 14.8% (out of 284 cases from three studies). Of the 580 patients in six studies, 446 (76.9%) returned to work, with a mean follow-up of 35.3 months. Most patients who have experienced COVID-19 should recover without experiencing mental illness
8	Nobari H. et al 2021 [16]	6 studies, 3177 patients	PedsQL, SF-36,	Three articles showed that the COVID-19 pandemic had a significant impact on the quality of life of children and adolescents, and the other did not report a comparison between the periods before and during the COVID-19 pandemic, although a decrease in quality of life can be observed. However, two papers did not find significant changes and one did not report values. Regarding gender differences, only two studies have analyzed this topic, finding no differences between girls and boys in the impact of the COVID-19 pandemic on HRQoL quality of life. Taking into account these results, this systematic review can confirm that COVID-19 has a negative impact on the HRQoL quality of life of children and/or adolescents

A higher impact on HRQoL has been reported in acute COVID, older women, patients with heavier jobs, and patients from low-income countries [10].

If you pay attention, some of the systematic reviews we analyzed [11,14] include more clinical data and the results of instrumental studies. Thus, we wanted to substantiate the causes of physical and psychological manifestations of COVID-19 that affect the HRQoL of post-COVID patients. In summary, HRQoL worsening pulmonary manifestations and asthenic syndrome were associated with impaired lung function, including pulmonary fibrosis in 39-83% of cases, as well as signs of peri-/perimio-/myocarditis (3-26% of cases). Incomplete recovery of olfactory and gustatory dysfunction (in 33-36% of the examined persons), impaired concentration are associated with changes in the microstructural and functional integrity of the brain with persistent neurological symptoms - in 55% of cases. Psychological signs are also associated with dysfunction of vital organs and systems [11,14].

Next, we examined the results of some independent studies, which covered the largest number of participants. Thus, we studied characteristics of individuals in detail (gender, age, comorbidities, etc.), whose HRQoL was seriously affected by the coronavirus infection. Also, this analysis allowed us to additionally conduct a comparative assessment of the applied HRQoL assessment tools in patients who underwent COVID-19.

In our opinion, it more clearly describes the condition of a post-COVID patient the data obtained by the Iranian scientists Arab-Zozani et al. [17] in 2021 as a result of a cross-sectional study involving 409 patients who have had COVID-19. According to the authors, the following manifestations influenced the HRQoL of participants:

- some mobility restrictions - 53.34%;
- some restrictions in self-service - 87.75%;
- some restrictions in daily activities - 58.97%;
- the presence of pain/discomfort - 57.97%;

-the presence of anxiety/depression - 41.26%.

The mean p-values of the EQ-5D-5L index were 0.6125 ± 0.006. The average score of the EQ-5D-5L index (mean value, SD): for men - 0.628 (0.201), for women - 0.585 (0.198), p=0.002. There was a statistically significant relationship between history of chronic illness and overall HRQoL scores, as well as between physical and psychological complications after COVID 19 and overall quality of life scores. It should be noted that 18% of the respondents were hospitalized in the intensive care unit [17].

Nguyen H.C. et al. (2020), who assessed the quality of life of 3,947 patients of the category we studied using the HLS-SF12 questionnaire, concluded that HRQoL was significantly higher in men and in people with higher education, with an average or high social status, who were engaged in more physical activity[18].

According to Barani S. et al. (2022) in persons over the age of 60, problems were reported regarding HRQoL in five parameters of EQ-5D problems in all areas at once: self-care (6.1%), ordinary activities, i.e. daily activities (10.6%), pain/discomfort (21.2%) and anxiety/depression (12.1%). Houseworkers were more likely to report pain/discomfort (21.4%), anxiety/depression (18.4%), and problems performing normal activities (17.5%). According to this group of researchers, the EQ-5D-5L is a good tool for measuring the quality of life of post-COVID patients, as the mean utility score of the EQ-5D was 0.925 ± 0.150 [19]. It should be noted that the available literature also contains studies proving the effectiveness of EQ-5D in assessing the quality of life of various diseases [20-22].

A number of studies have been devoted to the assessment of neuropsychiatric disorders in the period after recovery from COVID-19. Some authors deny the importance of the impact of mental health on the quality of life in favor of the physical [12]. At the same time, according to Rogers J.P. et al (2020) SARS-CoV-2 can cause delirium in a significant proportion of patients in the acute stage [15]. Clinicians should be aware of the possibility of depression, anxiety, fatigue, post-

traumatic stress disorder, and rarer neuropsychiatric syndromes in post-COVID patients in the long term.

Studies have also been conducted among children and adolescents aimed at assessing the quality of life after COVID-19. One study examined case histories of 3177 children and adolescents as a result of progressive selection. The analysis found that the COVID-19 pandemic significantly affected the quality of life of children and adolescents, and another did not

Conclusion

In patients with acute COVID-19 who were in intensive care units, quality of life is significantly lower than in patients with a long course of coronavirus infection. Decreases in HRQoL in COVID-19 survivors are most commonly associated with long-term manifestations of the disease, such as fatigue, shortness of breath, anosmia, sleep disturbances, and worsen mental health.

There are significant differences in HRQoL among COVID-19 survivors based on gender, age, disease severity, and study country. COVID-19 affects the HRQoL of women, patients with severe comorbidities, and patients over the age of 60.

References

1. Hu B., Guo H., Zhou P., Shi Z.L. Characteristics of SARS-CoV-2 and COVID-19. *Nature Reviews Microbiology*, 2021; 19(3):141-154. [\[CrossRef\]](#)
2. Karim S.S.A., Karim Q.A. Omicron SARS-CoV-2 variant: a new chapter in the COVID-19 pandemic. *The Lancet*, 2021; 398(10317): 2126-2128. [\[CrossRef\]](#)
3. Uddin M., Mustafa F., Rizvi T.A., Loney T. et al. SARS-CoV-2/COVID-19: viral genomics, epidemiology, vaccines, and therapeutic interventions. *Viruses*, 2020; 12(5), 526.
4. WHO Coronavirus (COVID-19). Website. [Cited 23 May 2022]. Available from URL: <https://covid19.who.int/?mapFilter=cases>.
5. Lopez-Leon S., Wegman-Ostrosky T., Perelman C., Sepulveda R. et al. More than 50 long-term effects of COVID-19: a systematic review and meta-analysis. *Scientific reports*, 2021; 11(1): 1-12. [\[CrossRef\]](#)
6. Shah W, Hillman T, Playford ED, Hishmeh L. Managing the long term effects of COVID-19: summary of NICE, SIGN, and RCGP rapid guideline. *BMJ*. 2021;372. [\[CrossRef\]](#)
7. Sivan M, Taylor S. NICE guideline on long COVID. *British Medical Journal Publishing Group*; 2020. [\[CrossRef\]](#)
8. Alwan NA, Johnson L. Defining Long COVID: Going back to the start. *Medicine*. 2021; 2(5): 501–504.
9. Malik P., Patel K., Pinto C., Jaiswal R. et al. Post-acute COVID-19 syndrome (PCS) and health-related quality of life (HRQoL) - A systematic review and meta-analysis. *Journal of medical virology*, 2022; 94(1): 253-262. [\[CrossRef\]](#)
10. Poudel A.N., Zhu S., Cooper N., Roderick P. et al. Impact of Covid-19 on health-related quality of life of patients: A structured review. *PLoS One*, 2021; 16(10): e0259164. [\[CrossRef\]](#)
11. Willi S., Lüthold R., Hunt A., Hänggi N.V. et al. COVID-19 sequelae in adults aged less than 50 years: A systematic review. *Travel Med Infect Dis*. 2021 Mar-Apr;40: 101995. [\[CrossRef\]](#).
12. Ariyo K., Canestrini S., David A.S., Ruck Keene A. et al. Quality of life in elderly ICU survivors before the COVID-19 pandemic: a systematic review and meta-analysis of cohort studies. *BMJ Open*. 2021 Oct 11; 11(10): e045086. [\[CrossRef\]](#).
13. Dorri M., Bazargany M.H.M., Khodaparast Z., Bahrami S. et al. Psychological problems and reduced health-related quality of life in the COVID-19 survivors. *Journal of Affective Disorders Reports*, 2021; 6: 100248. [\[CrossRef\]](#).
14. Michelen M., Manoharan L., Elkheir N., Cheng V. et al. Characterising long COVID: a living systematic review. *BMJ Glob Health*. 2021 Sep; 6(9):e005427. [\[CrossRef\]](#).
15. Rogers J.P., Chesney E., Oliver D., Pollak T.A. et al. Psychiatric and neuropsychiatric presentations associated with severe coronavirus infections: a systematic review and meta-analysis with comparison to the COVID-19 pandemic. *Lancet Psychiatry*. 2020; Jul; 7(7):611-627. [\[CrossRef\]](#).
16. Nobari H., Fashi M., Eskandari A., Villafaina S. et al. Effect of COVID-19 on Health-Related Quality of Life in Adolescents and Children: A Systematic Review. *Int J Environ Res Public Health*. 2021; Apr 25; 18(9): 4563. [\[CrossRef\]](#).
17. Arab-Zozani, M., Hashemi, F., Safari, H., Yousefi, M., & Ameri, H. (2020). Health-related quality of life and its associated factors in COVID-19 patients. *Osong public health and research perspectives*, 2020; 11(5): 296. [\[CrossRef\]](#).
18. Nguyen M.H., Pham T.T., Vu D.N., Do B.N. et al. Single and Combinative Impacts of Healthy Eating Behavior and Physical Activity on COVID-19-like Symptoms among Outpatients: A Multi-Hospital and Health Center Survey. *Nutrients*, 2021; 13(9), 3258. [\[CrossRef\]](#).
19. Barani S., Bhatnagar T., Natarajan M., Gayathri K. et al. Health-related quality of life among COVID-19 individuals: A cross-sectional study in Tamil Nadu, India. *Clinical epidemiology and global health*, 2022; 13: 100943. [\[CrossRef\]](#).
20. Schrag A., Selai C., Jahanshahi M., Quinn N. P. The EQ-5D—a generic quality of life measure - is a useful instrument to measure quality of life in patients with Parkinson's disease. *Journal of Neurology, Neurosurgery & Psychiatry*, 2000; 69(1): 67-73. [\[CrossRef\]](#).
21. Boczor S., Eisele M., Rakebrandt A., Menzel A. et al. Prognostic factors associated with quality of life in heart failure patients considering the use of the generic EQ-5D-5L™ in primary care: new follow-up results of the observational RECODE-HF study. *BMC family practice*, 2021; 22(1): 1-11. [\[CrossRef\]](#).
22. Boczor S., Daubmann A., Eisele M., Blozik E., Scherer M. Quality of life assessment in patients with heart failure: validity of the German version of the generic EQ-5D-5L™. *BMC Public Health*. 2019; 19: 1464. [\[CrossRef\]](#).
23. Nobari H., Fashi M., Eskandari A., Villafaina S. et al. Effect of COVID-19 on Health-Related Quality of Life in Adolescents and Children: A Systematic Review. *Int J Environ Res Public Health*. 2021; Apr 25; 18(9): 4563. [\[CrossRef\]](#).

report a comparison between the periods before and during the COVID-19 pandemic, although a decrease in quality of life can be observed. However, no significant changes were found in the results, and another reported no p-values [16].

It should be noted that the long-term impact of COVID-19 on patients' HRQoL is still in the early stages of investigation. There is also a need for more detailed study of the transferred coronavirus infection on the mental health of patients.

Conflict of interests. The authors declared no conflict of interest.

This review was conducted as part of the implementation of the Master's research by Zhanar Orazbekova on the topic: "Assessment of the quality of life associated with health among residents of Nur-Sultan who have had COVID-19."

COVID-19 ауырған науқастардың HRQoL деңгейіне әсер ететін факторлар

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Түйіндеме

Бұл шолуда COVID-19 ауырған науқастардың өмір сапасын бағалау жүргізілген 8 мета-талдау және жүйелі шолу нәтижелері сараланды.

Жан сақтау бөлімшелерінде жатқан жіті COVID-19-бен ауырған науқастардың өмір сапасы коронавирустық инфекцияның ұзақ ағымы бар науқастарға қарағанда айтарлықтай төмен. COVID-19 ауырған науқастардың HRQoL деңгейінің төмендеуі көп жағдайда шаршау, ентігу, аносмия, ұйқының бұзылуы және психикалық денсаулықтың нашарлауы сияқты аурудың ұзақ мерзімді белгілерімен байланысты.

COVID-19 ауырған науқастардың HRQoL деңгейі бойынша олардың жынысына, жасына, аурудың ауырлық дәрежесіне, қосымша ауруларының болуына және зерттеу жүргізілген елге байланысты айтарлықтай айырмашылықтар бар. COVID-19 әйелдердің, ауыр дәрежедегі қосымша аурулары бар науқастардың, жасы 60 жастан асқан науқастардың, әсіресе табысы төмен елдер тұрғындарының HRQoL деңгейіне кері әсер етеді. COVID-19 ауырған науқастардың HRQoL деңгейіне ұзақ мерзімді әсері әлі де болса зерттеудің бастапқы сатысында екені анықталды.

Осы шолу нәтижесінде біз EQ-5D-5L сауалнамасы COVID-19-дан кейінгі науқастардың HRQoL деңгейін бағалаудың тиімді құралы деген қорытындыға келдік.

Түйін сөздер: коронавирустық инфекция, COVID-19, денсаулыққа байланысты өмір сапасы, пост-коронавирустық ауру.

Факторы, влияющие на уровень HRQoL у пациентов, перенесших COVID-19

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Резюме

В данном обзоре проанализированы результаты 8 мета-анализов и систематических обзоров, в которых оценивалось качество жизни пациентов, перенесших COVID-19.

У пациентов с острым течением COVID-19, которые находились в отделениях интенсивной терапии качество жизни значительно ниже, чем у пациентов с длительным течением коронавирусной инфекции. Снижение HRQoL у пациентов, перенесших COVID-19 чаще всего связаны с долгосрочными проявлениями заболевания, такими как усталость, одышка, аносмия, нарушения сна и ухудшение психического здоровья.

Наблюдаются существенные различия в HRQoL у пациентов, перенесших COVID-19 в зависимости от пола, возраста, тяжести заболевания, наличия сопутствующих заболеваний и страны исследования. COVID-19 оказывает отрицательное влияние на HRQoL женщин, больных с тяжелыми сопутствующими заболеваниями, пациентов старше 60 лет, особенно у пациентов из стран с низким уровнем дохода. Долгосрочное воздействие COVID-19 на HRQoL пациентов еще находится на начальных стадиях изучения.

Результаты данного обзора позволили нам сделать вывод о том, что EQ-5D-5L является эффективным инструментом для оценки HRQoL у пациентов, перенесших COVID-19.

Ключевые слова: коронавирусная инфекция, COVID-19; качество жизни, связанное со здоровьем, посткоронавирусная болезнь.