

Sequelae in COVID-19 Patients Three Months after Hospital Discharge or Completion of Self-Isolation

Health Science Report, 2021, Vol. 4, Issue 4

Desdiani Desdiani^{1,2} Auditya Purwandini Sutarto³, Alfathul Nur Kharisma⁴ Hera Safitri⁵, Amalia Fitri Hakim¹, Salsabila Hanifa Rusyda¹

1 Faculty of Medicine, Universitas Sultan Ageng Tirtayasa, Cilegon, Indonesia

2 Department of Pulmonology and Respiratory Medicine, Bhayangkara Brimob Hospital, Depok, Indonesia

3 Department of Industrial Engineering, Universitas Qomaruddin Gresik, Gresik, Indonesia

4 Faculty of Medicine, Universitas Sriwijaya, Palembang, Indonesia

5 Faculty of Medicine, Universitas Andalas, Padang, Indonesia

Received: 19 May 2021; Revised: 16 September 2021; Accepted: 29 September 2021

Daftar Isi

Daftar Isi	2
Submission 20 Mei 2021	3
Author to Editor 31 Juli 2021	4
Submitted Manuscript	5
Peer Review Proses 31 Juli 2021	15
Re ; Peer Review Process 2 Agustus 2021	16
Decision on Manuscript 27 Agustus 2021	17
Revision	20
Transferred Manuscript 15 September 2021	23
Re : Peer Review Process 17 September 2021	24
Editor to Author : Response Letter 17 September 2021	25
Revision Manuscript	26
Decision Letter 29 September 2021	31
Manuscript Accepted 4 Oktober 2021	33
Manuscript Accepted 5 Oktober 2021	34
Editor to Author 26 Oktober 2021	45
Table added 26 Oktober 2021	46
Manuscript Revisions	47
Manuscript Accepted 11 November 2021	57
License was Successfully Submitted 13 November 2021	59
Information : Production	60
Article : Proof 30 November 2021	61
Correction Submitted 30 November 2021	63
Article Published 22 Desember 2021	64
Article Published Online 22Desember 2021	65
Published Article	66

Submission 20 Mei 2021

8/12/23, 2:39 PM

Yahoo Mail - Health Science Reports - Quote for Open Access Article Publication Charge - HSR-2021-05-0438

Health Science Reports - Quote for Open Access Article Publication Charge - HSR-2021-05-0438

Dari: cs-openaccess@wiley.com

Kepada: DESDIANI@YMAIL.COM

Tanggal: Kamis, 20 Mei 2021 pukul 17.34 WIB

Dear Dr. Desdiani Desdiani,

Thank you for your recent submission to Health Science Reports. Health Science Reports is an open access journal that levies article publication charges; therefore, I am writing to confirm the article publication charge based on the information you supplied during submission of the following manuscript:

Article Title: [Sequelae in COVID-19 Patients Three Months after Hospital Discharge or Completion of Self-Isolation](#)

Manuscript ID: HSR-2021-05-0438

If your manuscript is accepted for publication in Health Science Reports, you will be asked to pay the following:

Article Publication Charge: 1210 USD*

* Upon invoicing, tax will be added where applicable. If you are a tax-exempt individual or institution, you will be asked to provide your relevant tax information at that time. Please see <http://www.wileyopenaccess.com/details/content/12f25d2979e/Authors.html> for more information on publication charges and applicable taxes. You may provide an alternative billing address at the time of payment if an institution or another individual is paying the publication charge for your manuscript.

If you have questions about the status of your manuscript, please contact the Health Science Reports Editorial Office healthsciencereports@wiley.com.

Thank you for submitting your manuscript to Health Science Reports.

Sincerely,

Jennifer Bibon

Wiley Open Access

cs-openaccess@wiley.com

ref: QTE - QTD

Author to Editor 31 Juli 2021

8/11/23, 12:02 PM

Yahoo Mail - Re: Health Science Reports - Manuscript ID HSR-2021-05-0438 [email ref: SE-6-a]

Re: Health Science Reports - Manuscript ID HSR-2021-05-0438 [email ref: SE-6-a]

Dari: desdiani - (desdiani@ymail.com)

Kepada: healthsciencereports@wiley.com

Tanggal: Sabtu, 31 Juli 2021 pukul 05.36 WIB

Dear Editorial of Health Science Reports,

I have submitted my manuscript title "Sequalae in COVID-19 Patients Three Months after Hospital Discharge or Completion of Self Isolation" to your journal via the online submission system on 19-May-2021, the status changed to under review. However the status has remained unchanged ever since. I would be grateful if you could let me know whether there has been any further progress on my submission.

Best Regards,
Desdiani Desdiani

Pada Rabu, 19 Mei 2021 12.16.30 GMT+7, HealthScienceReports Journal Admin <onbehalf@manuscriptcentral.com> menulis:

19-May-2021

Dear Dr. Desdiani:

Your manuscript entitled "Sequalae in COVID-19 Patients Three Months after Hospital Discharge or Completion of Self-Isolation" by Desdiani, Desdiani; Sutarto, Auditya; Nurkharisma, Alfathul; Sari, Hera; Hakim, Amalia; Rusyda, Salsabila, has been successfully submitted online and is presently being given full consideration for publication in Health Science Reports.

Co-authors: Please contact the Editorial Office as soon as possible if you disagree with being listed as a co-author for this manuscript.

Your manuscript ID is HSR-2021-05-0438.

Please mention the above manuscript ID in all future correspondence or when calling the office for questions. If there are any changes in your street address or e-mail address, please log in to ScholarOne Manuscripts at <https://mc.manuscriptcentral.com/hsr-wiley> and edit your user information as appropriate.

You can also view the status of your manuscript at any time by checking your Author Center after logging in to <https://mc.manuscriptcentral.com/hsr-wiley>.

CASRAI CRediT Taxonomy: authors' contribution(s) to the submitted manuscript are attributed as below. Submitting Authors may provide Author Contributions at original submission but MUST provide the information at revised submission. At revision submission, all authors should check the contributions carefully as if your manuscript is accepted, this information will be included in the published article:

Thank you for submitting your manuscript to Health Science Reports.

Sincerely,
Health Science Reports Editorial Office

Submitted Manuscript

Sequelae in COVID-19 Patients Three Months after Hospital Discharge or Completion of Self-Isolation

**Desdiani Desdiani^{1,2}, Auditya Purwandini Sutarto³, Alfathul Nur Kharisma⁴, Hera Safitri⁵,
Amalia Fitri Hakim¹, Salsabila Hanifa Rusyda¹**

¹Faculty of Medicine, Universitas Sultan Ageng Tirtayasa, Cilegon, Banten, Indonesia

²Department of Pulmonology and Respiratory Medicine, Bhayangkara Brimob Hospital, Cimanggis, Depok, Indonesia

³Department of Industrial Engineering, Universitas Qomaruddin Gresik, Jln Raya Bungah no 1 Gresik, East Java, Indonesia

⁴Faculty of Medicine, Universitas Sriwijaya, Palembang, Indonesia

⁵Faculty of Medicine, Universitas Andalas, Padang, Indonesia

*Corresponding author:

Desdiani Desdiani

Faculty of Medicine, Universitas Sultan Ageng Tirtayasa, Jalan Jend. Sudirman No.20, RT.10/RW.5, Kotabumi, Cilegon, Banten, Indonesia 42434.

Tel +62254280330, Fax: +62254281254

E-mail : desdiani@ymail.com

Running Head: Sequelae in COVID-19 Patients

Introduction

Many patients experience post-COVID-19 sequelae that lead to impaired quality of life after recovering from COVID-19.¹ To date, there have been 1,657,035 cases of COVID-19, with 45,116

dead and 1,511,417 recovered in Indonesia.² We assessed sequelae in COVID-19 patients and most common sequelae, both those who had self-isolated and those who were hospitalized, who had recovered for more than three months after negative Polymerase Chain Reaction (PCR) swab results. COVID-19 Sequelae is persistent symptomatology and outcomes after hospital discharge or completion of self-isolation with a wide and multifaceted range of clinical manifestations were identified, including respiratory, gastrointestinal, neurological, cardiovascular symptoms, and other organ manifestations.¹

Methods

This study by the Faculty of Medicine, Sultan Ageng Tirtayasa University assessed the sequelae of adult patients who confirmed positive for COVID-19 infection based on PCR examination, who had undergone self-isolation or hospitalization and had been declared recovered for more than three months. These sequelae is persistent symptoms that develop during or following a confirmed case of COVID-19 and that continue for >28 days. The patients were retrospectively included in this study. Informed consent was signed by the patients, and this study was approved by the ethics committee of Bhayangkara Brimob Hospital. This study follows the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guideline. The sequelae of COVID-19 were those reported since the patient was declared negative by a PCR swab and had completed self-isolation or hospitalization for 10 days plus three days at the hospital, as recommended by the World Health Organization and the local Ministry of Health. The data collected were self-reported symptoms that appeared from when the patient was declared recovered from COVID-19 until 90 days later. The data were obtained from various cities in Indonesia.

A total of 214 patients who had been declared recovered from COVID-19 were contacted between January and March 2021 to complete a single electronic questionnaire between one month and three months after being declared recovered. Thirteen participants who did not complete the questionnaire were not included in the analysis. We performed only descriptive analysis due to the small number of participants. Data analysis was conducted using SPSS 23.

Results

A total of 201 participants, took part from Indonesia and were of Asian ethnicity with an average age of 39.35 years old; the participants included 109 (54.2%) males and 92 (45.8%) females with confirmed COVID-19 infection. A total of 19 COVID-19 patients (9.45%) had had no symptoms, 58 (28.85%) patients had undergone self-isolation, and 143 (71%) had required hospitalization (Table 1). Hypertension and diabetes mellitus were the most common comorbidities found in 31 patients (15.42%). A total of 17 (8.46%) participants were active smokers.

Overall, 127 of the 201 (63.18%) patients reported having experienced sequelae (Table 1). Of these 127 patients, sequelae were reported by 61 patients (48.03%) aged 18–39 years, 63 patients (49.60%) aged 40–64 years, and three patients (2.36%) aged ≥ 65 years. A total of 89 participants (62.2%) with sequelae had been hospitalized, and 38 (65.51%) had independently self-isolated. Sequelae were reported by 19 (9.45%) patients who initially had no symptoms, but after PCR was negative and they had completed self-isolation, persistent symptoms appeared and were believed not to derive from another illness condition. Some symptoms appeared to be dominant in the patient’s report. A total of 15 out of 31 (48.39%) patients with hypertension or diabetes (comorbidities) had persistent symptoms to date.

Table 1. Demographic and Clinical Characteristics of the Study Participants

Characteristics	No. %			
	Total recovered individuals (n = 201)	Inpatient (n = 143)	Outpatient Symptomatic (n = 39) Asymptomatic individuals (n = 19)	
Age, mean (SD)	39.35 (11.56)	39.1	40.2	39.6
Sex				
Women	92 (45.8)	57 (39.9)	27 (69.2)	8 (42.1)
Men	109 (54.2)	86 (60.1)	12 (30.8)	11 (57.9)
BMI, mean (SD)*	26.3	26.3	26.5	26.3
Comorbidities				
Hypertension	19 (9.45)	18 (12.59)	1 (2.6)	0 (0.0)

Diabetes	12 (5.97)	9 (6.29)	3 (7.7)	0 (0.0)
Active smoker	17 (8.46)	13 (9.09)	1 (2.6)	3 (15.8)
Duration of persistent symptoms (month)				
0	80 (39.8)	56 (39.2)	17 (43.6)	7 (36.8)
1–2	38 (18.9)	28 (19.6)	10 (25.6)	0 (0.0)
≥3	9 (4.5)	5 (3.5)	2 (5.12)	2 (10.5)
Missing	74 (36.8)	54 (37.8)	10 (25.6)	10 (52.6)
Worse quality of life	47 (23.4)	34 (23.8)	12 (30.8)	1 (5.3)
Symptoms (post-COVID follow-up)	127 (63.18)	89 (62.2)	27 (69.2)	11 (57.9)
Excessive fatigue/tiredness	69 (54.3)	44 (49.4)	21 (53.8)	4 (21.0)
Dyspnea/shortness of breath	26 (20.47)	18 (20.2)	5 (12.8)	3 (15.8)
Sleep disorders	25 (16.68)	17 (19.1)	7 (17.9)	1 (5.3)
Emotional instability	22 (17.3)	18 (20.2)	4 (10.3)	0 (0.0)
Difficulty concentrating	34 (26.77)	16 (17.97)	14 (35.9)	4 (21.0)
Digestive problems	25 (19.68)	16 (17.97)	8 (20.5)	1 (5.3)
Loss of appetite	9 (7.09)	7 (7.86)	2 (5.1)	0 (0.0)
Loss of smell	10 (7.84)	5 (5.61)	3 (7.7)	2 (10.5)
Muscle pain	24 (11.94)	23 (25.84)	1 (2.6)	0 (0.0)
Sore throat	8 (6.3)	7 (7.86)	1 (2.6)	0 (0.0)
Cough	33 (25.98)	25 (28.1)	7 (17.9)	1 (5.3)
Cold	19 (14.96)	16 (17.97)	3 (7.7)	0 (0.0)
Diarrhea	2 (1.57)	1 (1.1)	0 (0.0)	1 (5.3)

Earache	1 (0.79)	0 (0.0)	1 (2.6)	0 (0.0)
Sweating	15 (11.81)	14 (15.7)	1 (2.6)	0 (0.0)
Burning sensation on the skin	8 (6.3)	5 (5.6)	3 (7.7)	0 (0.0)
Chills	2 (1.57)	2 (2.25)	0 (0.0)	0 (0.0)
Felt feverish	13 (10.23)	13 (14.6)	0 (0.0)	0 (0.0)
Nausea	7 (5.51)	7 (7.86)	0 (0.0)	0 (0.0)

*BMI : Body Mass Index; SD : Standard Deviation

Table 2. Number of symptoms

Persistent symptoms	No. (%)
No symptoms	74 (36.8)
1–2 symptoms	83 (41.3)
≥3 symptoms	44 (21.9)

The most frequently reported sequelae were excessive fatigue (69/127 patients [54.33%]), difficulty concentrating (34/127 [26.77%]), and cough (33/127 patients [25.98%]) (Figure 1). A total of 83 (41.35%) participants experienced sequelae for 1–2 months, and 44 (21.9%) people experienced sequelae for three or more months (Table 2 and Figure 2). Overall, 47 out of 201 (23.38%) participants who had undergone self-isolation or who had been hospitalized reported a decrease in quality of life compared to three participants who had no symptoms (7.1%).

Discussion

In this study, patients were studied at three months after being discharged from hospital or declared recovered. A total of 127 (63.18%) patients reported sequelae that were still felt after being declared recovered with negative PCR confirmation. Eighty people (39.8%) reported sequelae lasting less than 1 month. A total of 38 people (18.9%) reported sequelae lasting around 1–2 months, and nine (4.5%) experienced sequelae ≥ 3 months after being discharged from hospital or

being declared recovered. Approximately 143 (71.14%) of the participants in our study had been hospitalized for COVID-19. Sequelae experienced for more than 1 month were reported by 33 (23.1%) of patients who were hospitalized. A study by Sudre et al. stated that as many as 20.1% of participants with COVID-19 still experienced symptoms and who had recovered from COVID-19 for more than 28 days to more than 12 weeks.³

The most reported sequelae in our study were excessive fatigue (69 of 127 patients [54.33%]), difficulty concentrating (34 of 127 patients [26.77%]), and cough (33 of 127 patients [25.98%]). A total of 83 (41.3%) participants experienced 1–2 sequelae symptoms, and 44 (21.9%) people experienced ≥ 3 sequelae. Fourteen out of 27 (51.85%) comorbid patients who had been hospitalized had persistent symptoms for more than 1 month. Garrigues et al revealed that the most reported persistent symptoms were fatigue (55%), shortness of breath (42%), loss of memory (34%), and impaired concentration and sleep (28% and 30.8%, respectively). Comparison of the persistent symptoms that occurred between the usual isolation-treated patients and the patients who received ICU care was statistically significant. Many symptoms persist several months after hospitalization for COVID-19. While there were few differences between health related quality of life (HRQoL) between ward and ICU patients.⁴ A study by Carfi et al. revealed that 87.4% of patients reported persistent symptoms of at least one symptom, especially fatigue and shortness of breath.⁵

A decrease in quality of life was reported in this study, with 47 patients (23.4%) from the total group of participants and 34 (23.8%) of the hospitalized patients experiencing a decrease in quality of life. Logue et al. also reported impaired quality of life in 30.7% of outpatients who had self-isolated.⁶

In the case of health workers who work in the operating room, the risk of contracting COVID-19 can have serious consequences. The importance of proper PPE use, reorganization of the operating schedule, use of safe operating techniques, and user-friendly surgical equipment are all good ways to avoid smoke production.⁷ Surgical team members responded to the COVID-19 pandemic with leadership and crisis management principles. Current recommendations are widely adopted in terms of organizational aspects and surgical management.⁸ The Surgery Departments implemented changes, including reorganizing surgical schedules, staff preparation, and the departments outbreak response policies and suggestions for surgical techniques and risk management.⁹

Surgeons reported that their apparent lack of safety and comfort, as well as increased fatigue, may have hampered their ability to perform at their best throughout surgery.¹⁰

This study is limited because of its small sample size. Although the respondents involved in this study came from several regions in Indonesia, the locations were not included in the analysis. There is potential for bias in reporting symptoms during the post-recovery period of up to three months. This study only analyzed symptoms that were observed and followed up with questionnaire completed by the patients, more than three months after recovery and which were not observed during hospitalization or self-isolation. This study also did not differentiate between isolation room in hospital and ICU inpatient care but only between patients who self-isolated and hospitalized patients. Our study shows that the sequelae of COVID-19 are still felt by patients even after being discharged from hospital when the PCR results are negative, thus affecting the participants' quality of life. This study is an initial report of the sequelae that are still felt by patients after recovery from COVID-19 in Indonesia.

ACKNOWLEDGMENT

The authors would like to thank Scribendi (scribendi.com) for the English language review.

FUNDING

No funding.

CONFLICT OF INTEREST

The authors declare no conflict of interest for this article.

AUTHOR CONTRIBUTIONS

Conceptualization : Desdiani Desdiani

Formal analysis: Desdiani Desdiani, Auditya Purwandini Sutarto

Investigation: Alfathul Nur Kharisma, Hera Safitri, Amalia Fitri Hakim, Salsabila Hanifa Rusyda

Project Administration: Desdiani Desdiani

Resources: Desdiani Desdiani, Auditya Purwandini Sutarto, Hera Safitri

Supervision: Desdiani Desdiani

Visualization: Hera Safitri, Amalia Fitri Hakim, Salsabila Hanifa Rusyda

Writing - Original Draft Preparation: Desdiani Desdiani, Amalia Fitri Hakim, Salsabila Hanifa Rusyda

Writing – Review & Editing: Desdiani Desdiani, Auditya Purwandini Sutarto, Amalia Fitri Hakim, Salsabila Hanifa Rusyda

All authors had read and approved the final version of the manuscript.

Desdiani Desdiani had full access to all of the data in this study and takes complete responsibility for the integrity of the data and the accuracy of the data analysis

TRANSPARENCY STATEMENT

Desdiani Desdiani confirms that the manuscript is a honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

DATA AVAILABILITY STATEMENT

The authors confirm that the data supporting the findings of this study are available within the article and its supplementary materials.

ORCID

Desdiani Desdiani <https://orcid.org/0000-0002-5907-9476>

REFERENCES

Del Rio C, Collins LF, Malani P. Long-term health consequences of COVID-19. *JAMA*. Publish online October 5, 2020. doi:10.1001/jama.2020.19719

Task Force for Handling COVID-19. Map of the Distribution of COVID-19 [Internet] Indonesia; 2021. [updated 2021; cited 2021 April 20]. Available from <https://covid19.go.id/peta-sebaran>.

Sudre CH, Murray B, Varsavsky T, Graham MS, Penfold RS, Bowyer RC, et al. Attributes and predictors of long COVID. *Nature Medicine* [Internet]. 2021 Mar 10 [cited 2021 Apr 29];27(4):626–31. Available from: <https://www.nature.com/articles/s41591-021-01292-y>

Garrigues E, Janvier P, Kherabi Y, Le Bot A, Hamon A, Gouze H, et al. Post-discharge persistent symptoms and health-related quality of life after hospitalization for COVID-19. *Journal of Infection* [Internet]. 2020 Dec [cited 2021 Apr 29];81(6):e4–6. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7445491/>

Carfi A, Bernabei R, Landi F. Persistent symptoms in patients after acute COVID-19. *JAMA*.2020. 11;324(6):603-605. doi: 10.1001/jama.2020.12603

Logue JK, Franko NM, McCulloch DJ, McDonald D, Magedson A, Wolf CR, et al. Sequelae in Adults at 6 Months After COVID-19 Infection. *JAMA Network Open* [Internet]. 2021 Feb 19 [cited 2021 Apr 29];4(2):e210830. Available from: <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2776560>

Benítez CY, Ribeiro MAF Jr, Alexandrino H, Koleda P, Baptista SF, Azfar M, Di Saverio S, Ponchietti L, Güemes A, Blas JL, Mesquita C. International cooperation group of emergency surgery during the COVID-19 pandemic. *Eur J Trauma Emerg Surg*. 2021 Jun;47(3):621-629. doi: 10.1007/s00068-020-01521-y. Epub 2020 Oct 13. PMID: 33047158; PMCID: PMC7550249.

Benitez CY, Pedival AN, Talal I, Cros B, Ribeiro MAF, Azfar M, Saverio SD, Laina JLB. Adapting to an unprecedented scenario: surgery during the COVID-19 outbreak. *Rev Col Bras Cir*. 2020;47:e20202701. Portuguese, English. doi: 10.1590/0100-6991e-20202701. Epub 2020 Aug 12. PMID: 32844915.

Benítez CY, Güemes A, Aranda J, Ribeiro M, Ottolino P, Di Saverio S, Alexandrino H, Ponchietti L, Blas JL; International Cooperation Group on PPE and Emergency Surgery, Ramos JP, Rangelova E, Muñoz M, Yáñez C Sr. Impact of Personal Protective Equipment on Surgical Performance During the COVID-19 Pandemic. *World J Surg.* 2020 Sep;44(9):2842-2847. doi: 10.1007/s00268-020-05648-2. PMID: 32564140; PMCID: PMC7305697.

Di Saverio S, Pata F, Khan M, Ietto G, Zani E, Carcano G. Convert to open: the new paradigm for surgery during COVID-19? *Br J Surg.* 2020 Jun;107(7):e194. doi: 10.1002/bjs.11662. Epub 2020 May 5. PMID: 32367551; PMCID: PMC7267491.

Peer Review Proses 31 Juli 2021

8/11/23, 12:02 PM

Yahoo Mail - RE: Health Science Reports - Manuscript ID HSR-2021-05-0438 [email ref: SE-6-a]

RE: Health Science Reports - Manuscript ID HSR-2021-05-0438 [email ref: SE-6-a]

Dari: Health Science Report (healthsciencereports@wiley.com)

Kepada: desdiani@ymail.com

Tanggal: Sabtu, 31 Juli 2021 pukul 22.19 WIB

Dear Dr. Desdiani,

Your manuscript is in peer review process.

The handling editor is actively inviting reviewers for your manuscript.

Your patience is much appreciated during this time.

Thank you very much.

Best regards,


Ronald

Ronald Nathanael (Dr.)

Editorial Assistant

Health Science Reports now offers Free Format submission for a fast and simple submission process. See our author guidelines at <https://onlinelibrary.wiley.com/page/journal/23988835/homepage/forauthors>

From: desdiani - <desdiani@ymail.com>
Sent: 31 July 2021 04:07
To: Health Science Report <healthsciencereports@wiley.com>
Subject: Re: Health Science Reports - Manuscript ID HSR-2021-05-0438 [email ref: SE-6-a]

 **This is an external email.**

Dear Editorial of Health Science Reports,

I have submitted my manuscript title "Sequalae in COVID-19 Patients Three Months after Hospital Discharge or Completion of Self Isolation" to your journal via the online submission system on 19-May-2021, the status changed to under review. However the status has remained unchanged ever since.

I would be grateful if you could let me know wether there has been any further progress on my submission.

Best Regards,

Re ; Peer Review Process 2 Agustus 2021

Re: Health Science Reports - Manuscript ID HSR-2021-05-0438 [email ref: SE-6-a]

Dari: desdiani - (desdiani@ymail.com)

Kepada: healthsciencereports@wiley.com

Tanggal: Senin, 2 Agustus 2021 pukul 11.27 WIB

Dear Dr. Ronald Nathanael-editorial assistant,

Thank you for the explanation, I really appreciate the response from the editorial. I will wait for the next submission process. Thank you for your attention

Best Regards,
Desdiani, MD, PhD

Pada Sabtu, 31 Juli 2021 22.19.58 GMT+7, Health Science Report <healthsciencereports@wiley.com> menulis:

Dear Dr. Desdiani,

Your manuscript is in peer review process.

The handling editor is actively inviting reviewers for your manuscript.

Your patience is much appreciated during this time.

Thank you very much.
Best regards,
Ronald

Ronald Nathanael (Dr.)
Editorial Assistant


Health Science Reports now offers Free Format submission for a fast and simple submission process. See our author guidelines at <https://onlinelibrary.wiley.com/page/journal/23988835/homepage/forauthors>

From: desdiani - <desdiani@ymail.com>

Sent: 31 July 2021 04:07

To: Health Science Report <healthsciencereports@wiley.com>

Subject: Re: Health Science Reports - Manuscript ID HSR-2021-05-0438 [email ref: SE-6-a]

 **This is an external email.**

Dear Editorial of Health Science Reports,

I have submitted my manuscript title "Sequalae in COVID-19 Patients Three Months after Hospital Discharge or Completion of Self Isolation" to your journal via the online submission system on 19-May-2021, the status changed to under review. However the status has remained unchanged ever since

Decision on Manuscript 27 Agustus 2021

8/12/23, 2:40 PM

Yahoo Mail - Health Science Reports - Decision on Manuscript ID HSR-2021-05-0438 [email ref: DL-SW-2-a]

Health Science Reports - Decision on Manuscript ID HSR-2021-05-0438 [email ref: DL-SW-2-a]

Dari: Health Science Reports (onbehalf@manuscriptcentral.com)

Kepada: desdiani@ymail.com

Tanggal: Jumat, 27 Agustus 2021 pukul 13.49 WIB

27-Aug-2021

Dear Dr. Desdiani,

Thank you for submitting your manuscript to Health Science Reports. Your manuscript has been reviewed by our reviewer panel and editors. Based on the comments, your manuscript would benefit from a revision. Therefore, I'm inviting you to respond to the comments attached below and submit a revised manuscript.

Please note that due to the extent of the requested revisions, a detailed response to all the editorial and reviewers' comments will be needed, and the new version will go out again for review. We may request additional revisions, or even reject, the manuscript at that point, if we consider that the concerns have not been adequately addressed.

We also recognise that the impact of the COVID-19 pandemic may affect your ability to return your revised manuscript to us within the requested timeframe. If this is the case, please let us know.

Before submitting your revised manuscript online:

1. Prepare a rebuttal letter with a point-by-point response to each reviewer comments and description of changes made to the manuscript. The page number and line number of changes should be clarified in the letter.

2. Prepare a revised manuscript (word document), highlighting the changes you've made. Save this new document on your computer as you will be asked to upload it during the revision submission process. NOTE: Please be sure to keep in mind reviewer comments and incorporate your responses within the manuscript. There may well be areas where you disagree; for example, you may want to write, "A reviewer suggests that... However, I disagree because...". In any case, please try to address all the concerns that are raised within the manuscript as carefully and adequately as possible in order to avoid unnecessary repetition of the revision process.

3. In addition to your revised manuscript with changes highlighted, please also save a "clean" copy where the changes are not marked.

Author Contribution Indication

The contributions of each author to this work must now be indicated when you submit your revised manuscript. To add Author Contributions using CRediT taxonomy (<https://casrai.org/credit/>), simply click the "Provide CRediT Contribution" link for each author in the 'Authors & Institutions' step of the submission process. From there, you will be able to check applicable Author/Contributor Roles and, if available, specify the Degree of Contribution. You MUST provide this information as part of the revision process. Author Contributions will be published with the accepted article and cannot be edited after article acceptance. Therefore you must ensure the Author Contribution information you provide is accurate prior to final acceptance.

To submit your revised submission:

1. Log in by clicking on the link below

*** PLEASE NOTE: This is a two-step process. After clicking on the link, you will be directed to a webpage to confirm. ***

https://mc.manuscriptcentral.com/hsr-wiley?URL_MASK=346952d273b04b6f918726572e432a53

OR

Log into <https://mc.manuscriptcentral.com/hsr-wiley> and click on Author Center. Under author resources, use the button "Click here to submit a revision". PLEASE DO NOT SUBMIT YOUR REVISIONS AS A NEW MANUSCRIPT.

2. Follow the on-screen instructions. First you will be asked to provide your "Response to Decision Letter"—this is the point-by-point response to reviewer comments that you prepared earlier.

3. Review and click through the next few screens to verify that all previously provided information is correct.

4. File Upload: Delete any files that you will be replacing (this includes your old submission) with your revised submission files. Upload your new revised submission file with changes highlighted, a "clean" (not highlighted) copy of your revised submission file, any replacement figures/tables, or any new files. Once this uploading is complete, the list of files in the "My Files" section should ONLY contain the final versions of your submission. REMEMBER: figures/tables should be in jpeg, tiff, or eps format.

5. Review and submit: please be sure to double-check everything carefully so that your article can be processed as quickly as possible.

Deadlines:

Our aim is to publish all Health Science Reports submissions as quickly as possible, and the sooner you are able to re-submit, the quicker our decision and publishing processes will be. If it is not possible for you to submit your revision in September 24th, 2021, please let us know.

Once again, thank you very much for submitting your article to Health Science Reports. Please let us know if you need any help with the revision process, and we look forward to receiving your revised article soon.

Sincerely,
Dr. Qian Chen
Managing Editor, Health Science Reports
qchen@wiley.com, qchen@wiley.com

Reviewer Comments to Author:

Reviewer: 1

No comments.

Reviewer: 2

Comments:

How to define "COVID-19 Sequelae" ? please clarify it in the manuscript.

Reviewer: 3

Comments:

This paper was well written. It's better to provide a figure detailing the enrollment of patients. In addition, the methods section should be restructured as follows: ethics, subjects (period, definition, excluding criteria), methods (such as data collection, questionnaire), and statistical methods.

Reviewer: 4

Comments:

An interesting article and timely during this pandemic

An interesting and well written and timely article on the topic of Sequelae in COVID-19 Patients Three Months after Hospital Discharge or Completion of Self-Isolation

from a general surgeon perspective in the field of general surgery, I would add a brief mention within the discussion section, discussing the use of PPE during EMergency surgery, the impact of the pandemic on the healthcare system and

especially the changes and delays that impacted surgery and surgical patients. Also important the consequences of the pandemic on the emergency surgery and how this affected the performance of emergency surgery.

Please references to

1) International cooperation group of emergency surgery during the COVID-19 pandemic.
Eur J Trauma Emerg Surg. 2020 Oct 13;1-9. doi: 10.1007/s00068-020-01521-y. Online ahead of print.

2) Adapting to an unprecedented scenario: surgery during the COVID-19 outbreak.
Rev Col Bras Cir. 2020;47:e20202701. doi: 10.1590/0100-6991e-20202701. Epub 2020 Aug 12

Worth discussing a bit further the General precautions and strategies for the staff to overcome transmission during clinical practice especially in EMS and Emergency services and you can add some perspective from the following

3) Impact of Personal Protective Equipment on Surgical Performance During the COVID-19 Pandemic.
International Cooperation Group on PPE and Emergency Surgery,
World J Surg. 2020 Sep;44(9):2842-2847. doi: 10.1007/s00268-020-05648-2

Perhaps a brief mention on the debate of use minimally invasive techniques and the risk of aerosolization and viral spreading during surgical procedures, and also during EMS

4) Laparoscopy at all costs? Not now during COVID-19 outbreak and not for acute care surgery and emergency colorectal surgery: A practical algorithm from a hub tertiary teaching hospital in Northern Lombardy, Italy.
J Trauma Acute Care Surg. 2020 Jun;88(6):715-718. doi: 10.1097/TA.0000000000002727

5) Convert to open: the new paradigm for surgery during COVID-19?
Br J Surg. 2020 Jun;107(7):e194. doi: 10.1002/bjs.11662. Epub 2020 May 5

I think enlarging the discussion section would add value to your article as well as increasing the number references (only 6 references at the moment that can be increased to 10). And discussing the above topics in the Discussion could make your article of more interest for a general reader and raise readers from other subspecialties as general surgery

Revision

Sequelae in COVID-19 Patients Three Months after Hospital Discharge or Completion of Self-Isolation

Desdiani Desdiani^{1,2}, Auditya Purwandini Sutarto³, Alfathul Nur Kharisma⁴, Hera Safitri⁵, Amalia Fitri Hakim¹, Salsabila Hanifa Rusyda¹

¹Faculty of Medicine, Universitas Sultan Ageng Tirtayasa, Cilegon, Banten, Indonesia

²Department of Pulmonology and Respiratory Medicine, Bhayangkara Brimob Hospital, Cimanggis, Depok, Indonesia

³Department of Industrial Engineering, Universitas Qomaruddin Gresik, Jln Raya Bungah no 1 Gresik, East Java, Indonesia

⁴Faculty of Medicine, Universitas Sriwijaya, Palembang, Indonesia

⁵Faculty of Medicine, Universitas Andalas, Padang, Indonesia

*Corresponding author:

Desdiani Desdiani

Faculty of Medicine, Universitas Sultan Ageng Tirtayasa, Jalan Jend. Sudirman No.20, RT.10/RW.5, Kotabumi, Cilegon, Banten, Indonesia 42434.

Tel +62254280330, Fax: +62254281254

E-mail : desdiani@ymail.com

Running Head: Sequelae in COVID-19 Patients

Introduction

Many patients experience post-COVID-19 sequelae that lead to impaired quality of life after recovering from COVID-19.¹ To date, there have been 1,657,035 cases of COVID-19, with 45,116 dead and 1,511,417 recovered in Indonesia.² We assessed sequelae in COVID-19 patients and most common sequelae, both those who had self-isolated and those who were hospitalized, who had recovered for more than three months after negative Polymerase Chain Reaction (PCR) swab results.

Methods

This study by the Faculty of Medicine, Sultan Ageng Tirtayasa University assessed the sequelae of adult patients who confirmed positive for COVID-19 infection based on PCR examination, who had undergone self-isolation or hospitalization and had been declared recovered for more than three months. These sequelae is persistent symptoms that develop during or following a confirmed case of COVID-19 and that continue for >28 days. The patients were retrospectively included in this study. Informed consent was signed by the patients, and this study was approved by the ethics committee of Bhayangkara Brimob Hospital. This study follows the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guideline. The sequelae of COVID-19 were those reported since the patient was declared negative by a PCR swab and had completed self-isolation or hospitalization for 10 days plus three days at the hospital, as recommended by the World Health Organization and the local Ministry of Health. The data collected were self-reported symptoms that appeared from when the patient was declared recovered from COVID-19 until 90 days later. The data were obtained from various cities in Indonesia.

A total of 214 patients who had been declared recovered from COVID-19 were contacted between January and March 2021 to complete a single electronic questionnaire between one month and three months after being declared recovered. Thirteen participants who did not complete the questionnaire were not included in the analysis. We performed only descriptive analysis due to the small number of participants. Data analysis was conducted using SPSS 23.

Results

A total of 201 participants, took part from Indonesia and were of Asian ethnicity with an average age of 39.35 years old; the participants included 109 (54.2%) males and 92 (45.8%) females with confirmed COVID-19 infection. A total of 19 COVID-19 patients (9.45%) had had no symptoms, 58 (28.85%) patients had undergone self-isolation, and 143 (71%) had required hospitalization (Table 1). Hypertension and diabetes mellitus were the most common comorbidities found in 31 patients (15.42%). A total of 17 (8.46%) participants were active smokers.

Overall, 127 of the 201 (63.18%) patients reported having experienced sequelae (Table 1). Of these 127 patients, sequelae were reported by 61 patients (48.03%) aged 18–39 years, 63 patients (49.60%) aged 40–64 years, and three patients (2.36%) aged ≥ 65 years. A total of 89 participants (62.2%) with sequelae had been hospitalized, and 38 (65.51%) had independently self-isolated. Sequelae were reported by 19 (9.45%) patients who initially had no symptoms, but after PCR was negative and they had completed self-isolation, persistent symptoms appeared and were believed not to derive from another illness condition. Some symptoms appeared to be dominant in the patient's report. A total of 15 out of 31 (48.39%) patients with hypertension or diabetes (comorbidities) had persistent symptoms to date.

The most frequently reported sequelae were excessive fatigue (69/127 patients [54.33%]), difficulty concentrating (34/127 [26.77%]), and cough (33/127 patients [25.98%]) (Figure 1). A total of 83 (41.35%) participants experienced sequelae for 1–2 months, and 44 (21.9%) people experienced sequelae for three or more months (Figure 2). Overall, 47 out of 201 (23.38%) participants who had undergone self-isolation or who had been hospitalized reported a decrease in quality of life compared to three participants who had no symptoms (7.1%).

Discussion

In this study, patients were studied at three months after being discharged from hospital or declared recovered. A total of 127 (63.18%) patients reported sequelae that were still felt after being declared recovered with negative PCR confirmation. Eighty people (39.8%) reported sequelae lasting less than 1 month. A total of 38 people (18.9%) reported sequelae lasting around 1–2 months, and nine (4.5%) experienced sequelae ≥ 3 months after being discharged from hospital or being declared recovered. Approximately 143 (71.14%) of the participants in our study had been hospitalized for COVID-19. Sequelae experienced for more than 1 month were reported by 33

(23.1%) of patients who were hospitalized. A study by Sudre et al. stated that as many as 20.1% of participants with COVID-19 still experienced symptoms and who had recovered from COVID-19 for more than 28 days to more than 12 weeks.³

The most reported sequelae in our study were excessive fatigue (69 of 127 patients [54.33%]), difficulty concentrating (34 of 127 patients [26.77%]), and cough (33 of 127 patients [25.98%]). A total of 83 (41.3%) participants experienced 1–2 sequelae symptoms, and 44 (21.9%) people experienced ≥ 3 sequelae. Fourteen out of 27 (51.85%) comorbid patients who had been hospitalized had persistent symptoms for more than 1 month. Garrigues et al revealed that the most reported persistent symptoms were fatigue (55%), shortness of breath (42%), loss of memory (34%), and impaired concentration and sleep (28% and 30.8%, respectively). Comparison of the persistent symptoms that occurred between the usual isolation-treated patients and the patients who received ICU care was statistically significant. Many symptoms persist several months after hospitalization for COVID-19. While there were few differences between health related quality of life (HRQoL) between ward and ICU patients.⁴ A study by Carfi et al. revealed that 87.4% of patients reported persistent symptoms of at least one symptom, especially fatigue and shortness of breath.⁵

A decrease in quality of life was reported in this study, with 47 patients (23.4%) from the total group of participants and 34 (23.8%) of the hospitalized patients experiencing a decrease in quality of life. Logue et al. also reported impaired quality of life in 30.7% of outpatients who had self-isolated.⁶

This study is limited because of its small sample size. Although the respondents involved in this study came from several regions in Indonesia, the locations were not included in the analysis. There is potential for bias in reporting symptoms during the post-recovery period of up to three months. This study only analyzed symptoms that were observed and followed up with questionnaire completed by the patients, more than three months after recovery and which were not observed during hospitalization or self-isolation. This study also did not differentiate between isolation room in hospital and ICU inpatient care but only between patients who self-isolated and hospitalized patients. Our study shows that the sequelae of COVID-19 are still felt by patients even after being discharged from hospital when the PCR results are negative, thus affecting the participants' quality of life. This study is an initial report of the sequelae that are still felt by patients after recovery from COVID-19 in Indonesia.

ACKNOWLEDGMENT

The authors would like to thank Scribendi (scribendi.com) for the English language review.

FUNDING

No funding.

CONFLICT OF INTEREST

The authors declare no conflict of interest for this article.

AUTHOR CONTRIBUTIONS

Conceptualization : Desdiani Desdiani

Formal analysis: Desdiani Desdiani, Auditya Purwandini Sutarto

Investigation: Alfathul Nur Kharisma, Hera Safitri, Amalia Fitri Hakim, Salsabila Hanifa Rusyda

Project Administration: Desdiani Desdiani

Resources: Desdiani Desdiani, Auditya Purwandini Sutarto, Hera Safitri

Supervision: Desdiani Desdiani

Visualization: Hera Safitri, Amalia Fitri Hakim, Salsabila Hanifa Rusyda

Writing - Original Draft Preparation: Desdiani Desdiani, Amalia Fitri Hakim, Salsabila Hanifa Rusyda

Writing – Review & Editing: Desdiani Desdiani, Auditya Purwandini Sutarto, Amalia Fitri Hakim, Salsabila Hanifa Rusyda

All authors had read and approved the final version of the manuscript.

Desdiani Desdiani had full access to all of the data in this study and takes complete responsibility for the integrity of the data and the accuracy of the data analysis

TRANSPARENCY STATEMENT

Desdiani Desdiani confirms that the manuscript is a honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

DATA AVAILABILITY STATEMENT

The authors confirm that the data supporting the findings of this study are available within the article and its supplementary materials.

ORCID

Desdiani Desdiani <https://orcid.org/0000-0002-5907-9476>

REFERENCES

1. Del Rio C, Collins LF, Malani P. Long-term health consequences of COVID-19. *JAMA*. Publish online October 5, 2020. doi:10.1001/jama.2020.19719
2. Task Force for Handling COVID-19. Map of the Distribution of COVID-19 [Internet] Indonesia; 2021. [updated 2021; cited 2021 April 20]. Available from <https://covid19.go.id/peta-sebaran>
3. Sudre CH, Murray B, Varsavsky T, Graham MS, Penfold RS, Bowyer RC, et al. Attributes and predictors of long COVID. *Nature Medicine* [Internet]. 2021 Mar 10 [cited 2021 Apr 29];27(4):626–31. Available from: <https://www.nature.com/articles/s41591-021-01292-y>
4. Garrigues E, Janvier P, Kherabi Y, Le Bot A, Hamon A, Gouze H, et al. Post-discharge persistent symptoms and health-related quality of life after hospitalization for COVID-19. *Journal of Infection* [Internet]. 2020 Dec [cited 2021 Apr 29];81(6):e4–6. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7445491/>
5. Carfi A, Bernabei R, Landi F. Persistent symptoms in patients after acute COVID-19. *JAMA*. 2020. 11;324(6):603-605. doi: 10.1001/jama.2020.12603
6. Logue JK, Franko NM, McCulloch DJ, McDonald D, Magedson A, Wolf CR, et al. Sequelae in Adults at 6 Months After COVID-19 Infection. *JAMA Network Open* [Internet]. 2021 Feb 19 [cited 2021 Apr 29];4(2):e210830. Available from: <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2776560>

Transferred Manuscript 15 September 2021

Health Science Reports - Manuscript ID HSR-2021-05-0438.R1 [email ref: SE-10-a]

Dari: HealthScienceReports Journal Admin (onbehalf@manuscriptcentral.com)

Kepada: desdiani@gmail.com

Cc: desdiani@gmail.com; audityapsutarto@gmail.com; alfathulnurkarisma@gmail.com; herfitsa1983@gmail.com; amaliafth01@gmail.com; sh.rusyda@gmail.com

Tanggal: Rabu, 15 September 2021 pukul 11.27 WIB

15-Sep-2021

Dear Dr. Desdiani:

Your transferred manuscript entitled "Sequelae in COVID-19 Patients Three Months after Hospital Discharge or Completion of Self-Isolation" has been successfully submitted online and is presently being given full consideration for publication in the Health Science Reports.

Your manuscript # is HSR-2021-05-0438.R1

Please mention the above manuscript # in all future correspondence regarding this submission.

You can view the status of your manuscript at any time by checking your Author Center after logging into <https://mc.manuscriptcentral.com/hsr-wiley>.

If you have any questions regarding the status of your manuscript please contact Unable to Display Letter Tag (##EMAIL_CONTACT_ADMIN_CENTER_FULLNAME ##) at healthsciencereports@wiley.com.

CASRAI CRediT Taxonomy: authors' contribution(s) to the submitted manuscript are attributed as below. Submitting Authors may provide Author Contributions at original submission but MUST provide the information at revised submission. At revision submission, all authors should check the contributions carefully as if your manuscript is accepted, this information will be included in the published article:

Thank you for submitting your manuscript to the Health Science Reports.

Sincerely,

Health Science Reports Editorial Office

Re : Peer Review Process 17 September 2021

8/11/23, 12:03 PM

Yahoo Mail - Re: Health Science Reports - Manuscript ID HSR-2021-05-0438 [email ref: SE-6-a]

Re: Health Science Reports - Manuscript ID HSR-2021-05-0438 [email ref: SE-6-a]

Dari: desdiani - (desdiani@ymail.com)

Kepada: healthsciencereports@wiley.com

Tanggal: Jumat, 17 September 2021 pukul 09.37 WIB

Dear Editorial Health Science Report Journal,

I have upload my response letter in step 1, below reviewer comments, but Health Science Report Journal admin was sent email and told me to upload author response letter as a separate file. Please help me to find the right step to submit my response letter.
Thank you for your attention.

Best Regards,
Desdiani Desdiani

Pada Sabtu, 31 Juli 2021 22.19.58 GMT+7, Health Science Report <healthsciencereports@wiley.com> menulis:

Dear Dr. Desdiani,

Your manuscript is in peer review process.

The handling editor is actively inviting reviewers for your manuscript.

Your patience is much appreciated during this time.

Thank you very much.
Best regards,
Ronald

Ronald Nathanael (Dr.)
Editorial Assistant

Health Science Reports now offers Free Format submission for a fast and simple submission process. See our author guidelines at <https://onlinelibrary.wiley.com/page/journal/23988835/homepage/forauthors>

Editor to Author : Response Letter 17 September 2021

8/11/23, 12:04 PM

Yahoo Mail - Health Science Reports - Manuscript ID HSR-2021-05-0438 [email ref: SE-6-a]

Health Science Reports - Manuscript ID HSR-2021-05-0438 [email ref: SE-6-a]

Dari: Health Science Report (healthsciencereports@wiley.com)

Kepada: desdiani@ymail.com

Tanggal: Jumat, 17 September 2021 pukul 13.39 WIB

Dear Dr. Desdiani,


Please send me the response letter so that I could upload it in ScholarOne.

Thank you very much.

Best regards,
Magesh (For Ronald)

Dr. Ronald Nathanael
Editorial Assistant
Health Science Reports
healthsciencereports@wiley.com

From: desdiani - <desdiani@ymail.com>
Sent: 17 September 2021 08:07
To: Health Science Report <healthsciencereports@wiley.com>
Subject: Re: Health Science Reports - Manuscript ID HSR-2021-05-0438 [email ref: SE-6-a]

 This is an external email.

Dear Editorial Health Science Report Journal,

I have unload mv response letter in step 1. below reviewer comments. but Health Science Report Journal admin was sent email and told me to unload

Revision Manuscript

Sequelae in COVID-19 Patients Three Months after Hospital Discharge or Completion of Self-Isolation

Desdiani Desdiani^{1,2}, Auditya Purwandini Sutarto³, Alfathul Nur Kharisma⁴, Hera Safitri⁵, Amalia Fitri Hakim¹, Salsabila Hanifa Rusyda¹

¹Faculty of Medicine, Universitas Sultan Ageng Tirtayasa, Cilegon, Banten, Indonesia

²Department of Pulmonology and Respiratory Medicine, Bhayangkara Brimob Hospital, Cimanggis, Depok, Indonesia

³Department of Industrial Engineering, Universitas Qomaruddin Gresik, Jln Raya Bungah no 1 Gresik, East Java, Indonesia

⁴Faculty of Medicine, Universitas Sriwijaya, Palembang, Indonesia

⁵Faculty of Medicine, Universitas Andalas, Padang, Indonesia

*Corresponding author:

Desdiani Desdiani

Faculty of Medicine, Universitas Sultan Ageng Tirtayasa, Jalan Jend. Sudirman No.20, RT.10 RW.5, Kotabumi, Cilegon, Banten, Indonesia 42434.

Tel +62254280330, Fax: +62254281254

E-mail : desdiani@gmail.com

Running Head: Sequelae in COVID-19 Patients

Introduction

Many patients experience post-COVID-19 sequelae that lead to impaired quality of life after recovering from COVID-19.¹ To date, there have been 1,657,035 cases of COVID-19, with 45,116 dead and 1,511,417 recovered in Indonesia.² We assessed sequelae in COVID-19 patients and most common sequelae, both those who had self-isolated and those who were hospitalized, who had recovered for more than three months after negative Polymerase Chain Reaction (PCR) swab results. COVID-19 Sequelae is persistent symptomatology and outcomes after hospital discharge or completion of self-isolation with a wide and multifaceted range of clinical manifestations were identified, including respiratory, gastrointestinal, neurological, cardiovascular symptoms, and other organ manifestations.¹

Methods

This study by the Faculty of Medicine, Sultan Ageng Tirtayasa University assessed the sequelae of adult patients who confirmed positive for COVID-19 infection based on PCR examination, who had undergone self-isolation or hospitalization and had been declared recovered for more than three months. These sequelae is persistent symptoms that develop during or following a confirmed case of COVID-19 and that continue for >28 days. The patients were retrospectively included in this study. Informed consent was signed by the patients, and this study was approved by the ethics committee of Bhayangkara Brimob Hospital. This study follows the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guideline. The sequelae of COVID-19 were those reported since the patient was declared negative by a PCR swab and had completed self-isolation or hospitalization for 10 days plus three days at the hospital, as recommended by the World Health Organization and the local Ministry of Health. The data collected were self-reported symptoms that appeared from when the patient was declared recovered from COVID-19 until 90 days later. The data were obtained from various cities in Indonesia.

A total of 214 patients who had been declared recovered from COVID-19 were contacted between January and March 2021 to complete a single electronic questionnaire between one month and three months after being declared recovered. Thirteen participants who did not complete the questionnaire were not included in the analysis. We

Results

A total of 201 participants, took part from Indonesia and were of Asian ethnicity with an average age of 39.35 years old; the participants included 109 (54.2%) males and 92 (45.8%) females with confirmed COVID-19 infection. A total of 19 COVID-19 patients (9.45%) had had no symptoms, 58 (28.85%) patients had undergone self-isolation, and 143 (71%) had required hospitalization (Table 1). Hypertension and diabetes mellitus were the most common comorbidities found in 31 patients (15.42%). A total of 17 (8.46%) participants were active smokers.

Overall, 127 of the 201 (63.18%) patients reported having experienced sequelae (Table 1). Of these 127 patients, sequelae were reported by 61 patients (48.03%) aged 18–39 years, 63 patients (49.60%) aged 40–64 years, and three patients (2.36%) aged ≥ 65 years. A total of 89 participants (62.2%) with sequelae had been hospitalized, and 38 (65.51%) had independently self-isolated. Sequelae were reported by 19 (9.45%) patients who initially had no symptoms, but after PCR was negative and they had completed self-isolation, persistent symptoms appeared and were believed not to derive from another illness condition. Some symptoms appeared to be dominant in the patient's report. A total of 15 out of 31 (48.39%) patients with hypertension or diabetes (comorbidities) had persistent symptoms to date.

Table 1. Demographic and Clinical Characteristics of the Study Participants

Characteristics	Total recovered individuals (n = 201)	No. %		
		Inpatient (n = 143)	Symptomatic (n = 39)	Outpatient Asymptomatic individuals (n = 19)
Age, mean (SD)	39.35 (11.56)	39.1	40.2	39.6
Sex				
Women	92 (45.8)	57 (39.9)	27 (69.2)	8 (42.1)
Men	109 (54.2)	86 (60.1)	12 (30.8)	11 (57.9)
BMI, mean (SD)*	26.3	26.3	26.5	26.3
Comorbidities				
Hypertension	19 (9.45)	18 (12.59)	1 (2.6)	0 (0.0)
Diabetes	12 (5.97)	9 (6.29)	3 (7.7)	0 (0.0)
Active smoker	17 (8.46)	13 (9.09)	1 (2.6)	3 (15.8)
Duration of persistent symptoms (month)				
0	80 (39.8)	56 (39.2)	17 (43.6)	7 (36.8)
1–2	38 (18.9)	28 (19.6)	10 (25.6)	0 (0.0)
≥ 3	9 (4.5)	5 (3.5)	2 (5.12)	2 (10.5)
Missing	74 (36.8)	54 (37.8)	10 (25.6)	10 (52.6)
Worse quality of life	47 (23.4)	34 (23.8)	12 (30.8)	1 (5.3)
Symptoms (post-COVID follow-up)	127 (63.18)	89 (62.2)	27 (69.2)	11 (57.9)
Excessive fatigue/tiredness	69 (54.3)	44 (49.4)	21 (53.8)	4 (21.0)
Dyspnea/shortness of breath	26 (20.47)	18 (20.2)	5 (12.8)	3 (15.8)
Sleep disorders	25 (16.68)	17 (19.1)	7 (17.9)	1 (5.3)
Emotional instability	22 (17.3)	18 (20.2)	4 (10.3)	0 (0.0)
Difficulty concentrating	34 (26.77)	16 (17.97)	14 (35.9)	4 (21.0)
Digestive problems	25 (19.68)	16 (17.97)	8 (20.5)	1 (5.3)
Loss of appetite	9 (7.09)	7 (7.86)	2 (5.1)	0 (0.0)
Loss of smell	10 (7.84)	5 (5.61)	3 (7.7)	2 (10.5)
Muscle pain	24 (11.94)	23 (25.84)	1 (2.6)	0 (0.0)
Sore throat	8 (6.3)	7 (7.86)	1 (2.6)	0 (0.0)
Cough	33 (25.98)	25 (28.1)	7 (17.9)	1 (5.3)
Cold	19 (14.96)	16 (17.97)	3 (7.7)	0 (0.0)
Diarrhea	2 (1.57)	1 (1.1)	0 (0.0)	1 (5.3)

Earache	1 (0.79)	0 (0.0)	1 (2.6)	0 (0.0)
Sweating	15 (11.81)	14 (15.7)	1 (2.6)	0 (0.0)
Burning sensation on the skin	8 (6.3)	5 (5.6)	3 (7.7)	0 (0.0)
Chills	2 (1.57)	2 (2.25)	0 (0.0)	0 (0.0)
Felt feverish	13 (10.23)	13 (14.6)	0 (0.0)	0 (0.0)
Nausea	7 (5.51)	7 (7.86)	0 (0.0)	0 (0.0)

*BMI : Body Mass Index; SD : Standard Deviation

Table 2. Number of symptoms

Persistent symptoms	No. (%)
No symptoms	74 (36.8)
1-2 symptoms	83 (41.3)
≥3 symptoms	44 (21.9)

The most frequently reported sequelae were excessive fatigue (69/127 patients [54.33%]), difficulty concentrating (34/127 [26.77%]), and cough (33/127 patients [25.98%]) (Figure 1). A total of 83 (41.35%) participants experienced sequelae for 1–2 months, and 44 (21.9%) people experienced sequelae for three or more months (Table 2 and Figure 2). Overall, 47 out of 201 (23.38%) participants who had undergone self-isolation or who had been hospitalized reported a decrease in quality of life compared to three participants who had no symptoms (7.1%).

Discussion

In this study, patients were studied at three months after being discharged from hospital or declared recovered. A total of 127 (63.18%) patients reported sequelae that were still felt after being declared recovered with negative PCR confirmation. Eighty people (39.8%) reported sequelae lasting less than 1 month. A total of 38 people (18.9%) reported sequelae lasting around 1–2 months, and nine (4.5%) experienced sequelae ≥ 3 months after being discharged from hospital or being declared recovered.

Approximately 143 (71.14%) of the participants in our study had been hospitalized for COVID-19. Sequelae experienced for more than 1 month were reported by 33 (23.1%) of patients who were hospitalized. A study by Sudre et al. stated that as many as 20.1% of participants with COVID-19 still experienced symptoms and who had recovered from COVID-19 for more than 28 days to more than 12 weeks.³

The most reported sequelae in our study were excessive fatigue (69 of 127 patients [54.33%]), difficulty concentrating (34 of 127 patients [26.77%]), and cough (33 of 127 patients [25.98%]). A total of 83 (41.3%) participants experienced 1–2 sequelae symptoms, and 44 (21.9%) people experienced ≥ 3 sequelae. Fourteen out of 27 (51.85%) comorbid patients who had been hospitalized had persistent symptoms for more than 1 month. Garrigues et al revealed that the most reported persistent symptoms were fatigue (55%), shortness of breath (42%), loss of memory (34%), and impaired concentration and sleep (28% and 30.8%, respectively). Comparison of the persistent symptoms that occurred between the usual isolation-treated patients and the patients who received ICU care was statistically significant. Many symptoms persist several months after hospitalization for COVID-19. While there were few differences between health related quality of life (HRQoL) between ward and ICU patients.⁴ A study by Carfi et al. revealed that 87.4% of patients reported persistent symptoms of at least one symptom, especially fatigue and shortness of breath.⁵

A decrease in quality of life was reported in this study, with 47 patients (23.4%) from the total group of participants and 34 (23.8%) of the hospitalized patients experiencing a decrease in quality of life. Logue et al. also reported impaired quality of life in 30.7% of outpatients who had self-isolated.⁶

In the case of health workers who work in the operating room, the risk of contracting COVID-19 can have serious consequences. The importance of proper PPE use, reorganization of the operating schedule, use of safe operating techniques, and user-friendly surgical equipment are all good ways to avoid smoke production.⁷ Surgical team members responded to the COVID-19 pandemic with leadership and crisis management principles. Current recommendations are widely adopted in terms of organizational aspects and surgical management.⁸ The Surgery Departments implemented changes, including reorganizing surgical schedules, staff preparation, and the departments outbreak response policies and suggestions for surgical techniques and risk management.⁹ Surgeons reported that their apparent lack of safety and comfort, as well as increased fatigue, may have hampered their ability to perform at their best throughout surgery.¹⁰

This study is limited because of its small sample size. Although the respondents involved in this study came from several regions in Indonesia, the locations were not included in the analysis. There is potential for bias in reporting symptoms during the post-recovery period of up to three months. This study only analyzed symptoms that were observed and followed up with questionnaire completed by the patients, more than three months after recovery and which were not observed during hospitalization or self-isolation. This study also did not differentiate between isolation room in hospital and ICU inpatient care but only between patients who self-isolated and hospitalized patients. Our study shows that the sequelae of COVID-19 are still felt by patients even after being discharged from hospital when the PCR results are negative, thus affecting the participants' quality of life. This study is an initial report of the sequelae that are still felt by patients after recovery from COVID-19 in Indonesia.

ACKNOWLEDGMENT

The authors would like to thank Scribendi (scribendi.com) for the English language review.

FUNDING

No funding.

CONFLICT OF INTEREST

The authors declare no conflict of interest for this article.

AUTHOR CONTRIBUTIONS

Conceptualization : Desdiani Desdiani

Formal analysis: Desdiani Desdiani, Auditya Purwandini Sutarto

Investigation: Alfathul Nur Kharisma, Hera Safitri, Amalia Fitri Hakim, Salsabila Hanifa Rusyda

Project Administration: Desdiani Desdiani

Resources: Desdiani Desdiani, Auditya Purwandini Sutarto, Hera Safitri

Supervision: Desdiani Desdiani

Visualization: Hera Safitri, Amalia Fitri Hakim, Salsabila Hanifa Rusyda

Writing - Original Draft Preparation: Desdiani Desdiani, Amalia Fitri Hakim, Salsabila Hanifa Rusyda

Writing - Review & Editing: Desdiani Desdiani, Auditya Purwandini Sutarto, Amalia Fitri Hakim, Salsabila Hanifa Rusyda

All authors had read and approved the final version of the manuscript.

Desdiani Desdiani had full access to all of the data in this study and takes complete responsibility for the integrity of the data and the accuracy of the data analysis

TRANSPARENCY STATEMENT

Desdiani Desdiani confirms that the manuscript is a honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

DATA AVAILABILITY STATEMENT

The authors confirm that the data supporting the findings of this study are available within the article and its supplementary materials.

ORCID

Desdiani Desdiani <https://orcid.org/0000-0002-5907-9476>

REFERENCES

1. Del Rio C, Collins LF, Malani P. Long-term health consequences of COVID-19. *JAMA*. Publish online October 5, 2020. doi:10.1001/jama.2020.19719
 2. Task Force for Handling COVID-19. Map of the Distribution of COVID-19 [Internet] Indonesia; 2021. [updated 2021; cited 2021 April 20]. Available from <https://covid19.go.id/peta-sebaran>.
 3. Sudre CH, Murray B, Varsavsky T, Graham MS, Penfold RS, Bowyer RC, et al. Attributes and predictors of long COVID. *Nature Medicine* [Internet]. 2021 Mar 10
-

REFERENCES

1. Del Rio C, Collins LF, Malani P. Long-term health consequences of COVID-19. *JAMA*. Publish online October 5, 2020. doi:10.1001/jama.2020.19719
2. Task Force for Handling COVID-19. Map of the Distribution of COVID-19 [Internet] Indonesia; 2021. [updated 2021; cited 2021 April 20]. Available from <https://covid19.go.id/peta-sebaran>.
3. Sudre CH, Murray B, Varsavsky T, Graham MS, Penfold RS, Bowyer RC, et al. Attributes and predictors of long COVID. *Nature Medicine* [Internet]. 2021 Mar 10 [cited 2021 Apr 29];27(4):626–31. Available from: <https://www.nature.com/articles/s41591-021-01292-y>
4. Garrigues E, Janvier P, Kherabi Y, Le Bot A, Hamon A, Gouze H, et al. Post-discharge persistent symptoms and health-related quality of life after hospitalization for COVID-19. *Journal of Infection* [Internet]. 2020 Dec [cited 2021 Apr 29];81(6):e4–6. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7445491/>
5. Carfi A, Bernabei R, Landi F. Persistent symptoms in patients after acute COVID-19. *JAMA*. 2020. 11;324(6):603–605. doi: 10.1001/jama.2020.12603
6. Logue JK, Franko NM, McCulloch DJ, McDonald D, Magedson A, Wolf CR, et al. Sequelae in Adults at 6 Months After COVID-19 Infection. *JAMA Network Open* [Internet]. 2021 Feb 19 [cited 2021 Apr 29];4(2):e210830. Available from: <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2776560>
7. Benitez CY, Ribeiro MAF Jr, Alexandrino H, Koleda P, Baptista SF, Azfar M, Di Saverio S, Ponchiotti L, Güemes A, Blas JL, Mesquita C. International cooperation group of emergency surgery during the COVID-19 pandemic. *Eur J Trauma Emerg Surg*. 2021 Jun;47(3):621–629. doi: 10.1007/s00068-020-01521-y. Epub 2020 Oct 13. PMID: 33047158; PMCID: PMC7550249.
8. Benitez CY, Pedival AN, Talal I, Cros B, Ribeiro MAF, Azfar M, Saverio SD, Laina JLB. Adapting to an unprecedented scenario: surgery during the COVID-19 outbreak. *Rev Col Bras Cir*. 2020;47:e20202701. Portuguese, English. doi: 10.1590/0100-6991e-20202701. Epub 2020 Aug 12. PMID: 32844915.
9. Benitez CY, Güemes A, Aranda J, Ribeiro M, Ottolino P, Di Saverio S, Alexandrino H, Ponchiotti L, Blas JL; International Cooperation Group on PPE and Emergency Surgery, Ramos JP, Rangelova E, Muñoz M, Yáñez C Sr. Impact of Personal Protective Equipment on Surgical Performance During the COVID-19 Pandemic. *World J Surg*. 2020 Sep;44(9):2842–2847. doi: 10.1007/s00268-020-05648-2. PMID: 32564140; PMCID: PMC7305697.
10. Di Saverio S, Pata F, Khan M, Jetto G, Zani E, Carcano G. Convert to open: the new paradigm for surgery during COVID-19? *Br J Surg*. 2020 Jun;107(7):e194. doi: 10.1002/bjs.11662. Epub 2020 May 5. PMID: 32367551; PMCID: PMC7267491.

Decision Letter 29 September 2021

Decision Letter (HSR-2021-05-0438.R1)

From: qchen@wiley.com

To: desdiani@gmail.com, audityapsutarto@gmail.com, alfathulnurkarisma@gmail.com, herfitsa1983@gmail.com, amaliafth01@gmail.com, sh.rusyda@gmail.com

CC:

Subject: Health Science Reports - Decision on Manuscript ID HSR-2021-05-0438.R1 [email ref: DL-SW-1-a]

Body: 29-Sep-2021

Dear Dr. Desdiani,

Thank you for submitting your revised manuscript to Health Science Reports. I very much enjoyed reading the revision.

I've reviewed your revised manuscript and your response to my comments and those of the reviewers, and I think all of the concerns raised have been satisfactorily addressed. I am thereby pleased to inform you that your manuscript has now been accepted for publication in Health Science Reports.

While your submission has been accepted, the files will now be checked to ensure that we have everything in place for publication. The editorial office will return the manuscript to your Author's dashboard within 2 working days for you to make the final adjustments before proceeding with production. Once you have completed uploading the final files, we will proceed with production.

The final version of your article cannot be published until the publisher has received the appropriate signed license agreement. Once your article has been received by Wiley for production the corresponding author will receive an email from Wiley's Author Services system which will ask them to log in and will present them with the appropriate license for completion.

Payment of your Open Access Article Publication Charge (APC):
All articles published in Health Science Reports are fully open access: immediately and freely available to read, download and share. Health Science Reports charges an article publication charge (APC).

Before we can publish your article, your payment must be completed. The corresponding author for this manuscript will have already received a quote email shortly after original submission with the estimated Article Publication Charge; please let us know if this has not been received. Once your accepted paper is in production, the corresponding author will receive an e-mail inviting them to register with or log in to Wiley Author Services (www.wileyauthors.com) where the publication fee can be paid by credit card, or an invoice or proforma can be requested. The option to pay via credit card and claim reimbursement from your institution may help to avoid delays with payment processing.

Once published, we encourage you to promote your article on social media and follow our Twitter account (@HSR_journal). If you would like us to tag any specific Twitter account or hashtag when we promote your article online, please let us know, and we'll explore this.

To further disseminate your research, you may consider creating a "Visual Abstract", an approach aimed at visually summarizing key points from an article, for use on social media. You can find more information, including a primer, examples, and videos, here:
<https://www.surgeryredesign.com/#resources-section>.

Congratulations! I hope your experience with us was a positive one, and the reviews and editorial comments were useful and fair. I also hope you will consider us for future articles. Any final comments made by the referees are included below.

Thank you again for choosing Health Science Reports for publishing your work.

Best wishes,

Dr. Qian Chen
Managing Editor, Health Science Reports
qchen@wiley.com, qchen@wiley.com

https://mc.manuscriptcentral.com/hsr-wiley?PARAMS=xik_3eypWma9JRNGMkFFIHbXWUGNabRpEdhVP6zp6rNJUB9Y9dTdKIN36ZEG3L1d9rTbKrf... 1/3

11:55 AM

ScholarOne Manuscripts

Dr. Tina Wang
Editor-in-Chief, Health Science Reports
twang@wiley.com

Reviewer Comments to Author:
Reviewer: 3

Recommendation: Accept

Comments:
Thank you.

Reviewer: 2

Recommendation: Accept

Comments:
Very nice after revising!

Reviewer: 1

Recommendation: Accept

Comments:
Well written and accurately revised. Now it is too much better with addition of reviewer comments.
it is better suited for publication now

P.S. We believe your images might be appropriate for use on the cover of the journal. This is an optional, premium service that aims to increase exposure and showcase your research through a different medium. The cost of this service is \$ for a front cover, which will be charged to you if your Cover Image is selected to be featured. If you would like to submit images from your paper, or an alternative original image related to the work, please email your suggestions to covers@wiley.com for consideration. Please see our Cover Image FAQ <https://authorservices.wiley.com/author-resources/Journal-Authors/Promotion/journal-cover-image.html> for details on Cover Image preparation and submission. Waivers and discounts are available, following the Wiley Open Access guidelines based on authors' location: <https://authorservices.wiley.com/open-science/open-access/for-authors/waivers-and-discounts.html>.

Date Sent: 29-Sep-2021

Manuscript Accepted 4 Oktober 2021

8/12/23, 2:43 PM

Yahoo Mail - Manuscript Accepted - Please submit final updates to HSR-2021-05-0438.R1 [email ref: ENR-AW-1-c]

Manuscript Accepted - Please submit final updates to HSR-2021-05-0438.R1 [email ref: ENR-AW-1-c]

Dari: HealthScienceReports Journal Admin (onbehalf@manuscriptcentral.com)

Kepada: desdiani@ymail.com

Tanggal: Senin, 4 Oktober 2021 pukul 14.07 WIB

04-Oct-2021

Dear Dr. Desdiani:

Manuscript id: HSR-2021-05-0438.R1

Manuscript title: Sequelae in COVID-19 Patients Three Months after Hospital Discharge or Completion of Self-Isolation

Although your manuscript has been accepted for publication it is now being returned to your author center for you to review and make any final adjustments or corrections prior to production and publication.

Any special instructions will be listed below:

Graphical Table of Contents section has to be updated in ScholarOne.

The simplest way to access the paper and go directly to step 1 in the First Look submission process is to use the link below:

https://mc.manuscriptcentral.com/hsr-wiley?URL_MASK=4f916e395741476fbc513a00d3e1f9b1

Alternatively, you may access the paper by logging into your ScholarOne Manuscripts Author Center and clicking on the "Manuscripts Accepted for First Look" queue. In order to update the submission, click on the "submit updated manuscript" link in the "Actions" column and follow the steps as you would during a manuscript submission process.

On the File Upload screen please upload the FINAL versions of all the files, including print quality image files. For information about image quality requirements, please refer to the guidelines at:

http://exchanges.wiley.com/authors/digital-artwork_335.html

Instructions for uploading replacement files:

1. On the 'File Upload' step, click on the drop down list under 'Actions' for the file you wish to replace. Select 'Upload New Version'
2. Click 'Select File' and browse to locate the replacement final version
3. Select whether the new file is a minor or major version (we suggest minor version)
4. Add any comments concerning the replacement (e.g. 'high res image')
5. Click 'Upload New Version'
6. Click 'Submit' when all the files have been uploaded and you will receive an automated email to say that submission is successful.

Please submit your updates within the next 7 days to ensure there are no unnecessary delays in production.

Sincerely,
Health Science Reports Editorial Office

Manuscript Accepted 5 Oktober 2021

8/12/23, 2:43 PM

Yahoo Mail - Manuscript Accepted - Updates Received HSR-2021-05-0438.R1 [email ref: ENR-AW-1-f]

Manuscript Accepted - Updates Received HSR-2021-05-0438.R1 [email ref: ENR-AW-1-f]

Dari: HealthScienceReports Journal Admin (onbehalf@manuscriptcentral.com)

Kepada: desdiani@ymail.com

Tanggal: Selasa, 5 Oktober 2021 pukul 12.23 WIB

05-Oct-2021

Dear Dr. Desdiani:

HSR-2021-05-0438.R1

This is an automatic email to thank you for returning your final files. These will now be checked and you will be informed if any further updates are needed. If no updates are required the files will be sent to production.

For reference, Author Response to First Look Comments/Instructions (if any) appear below:
I agree with the final revised manuscript. Thank you

Sincerely,
Health Science Reports Editorial Office

**Sequelae in COVID-19 Patients Three Months after Hospital Discharge or Completion of
Self-Isolation**

**Desdiani Desdiani^{1,2}, Auditya Purwandini Sutarto³, Alfathul Nur Kharisma⁴, Hera Safitri⁵,
Amalia Fitri Hakim¹, Salsabila Hanifa Rusyda¹**

¹Faculty of Medicine, Universitas Sultan Ageng Tirtayasa, Cilegon, Banten, Indonesia

²Department of Pulmonology and Respiratory Medicine, Bhayangkara Brimob Hospital,
Cimanggis, Depok, Indonesia

³Department of Industrial Engineering, Universitas Qomaruddin Gresik, Jln Raya Bungah no 1
Gresik, East Java, Indonesia

⁴Faculty of Medicine, Universitas Sriwijaya, Palembang, Indonesia

⁵Faculty of Medicine, Universitas Andalas, Padang, Indonesia

***Corresponding author:**

Desdiani Desdiani

Faculty of Medicine, Universitas Sultan Ageng Tirtayasa, Jalan Jend. Sudirman No.20,
RT.10/RW.5, Kotabumi, Cilegon, Banten, Indonesia 42434.

Tel +62254280330, Fax: +62254281254

E-mail : desdiani@ymail.com

Running Head: Sequelae in COVID-19 Patients

Introduction

Many patients experience post-COVID-19 sequelae that lead to impaired quality of life after recovering from COVID-19.¹ To date, there have been 1,657,035 cases of COVID-19, with 45,116 dead and 1,511,417 recovered in Indonesia.² We assessed sequelae in COVID-19 patients and most common sequelae, both those who had self-isolated and those who were hospitalized, who had recovered for more than three months after negative Polymerase Chain Reaction (PCR) swab results.

Methods

This study by the Faculty of Medicine, Sultan Ageng Tirtayasa University assessed the sequelae of adult patients who confirmed positive for COVID-19 infection based on PCR examination, who had undergone self-isolation or hospitalization and had been declared recovered for more than three months. These sequelae is persistent symptoms that develop during or following a confirmed case of COVID-19 and that continue for >28 days. The patients were retrospectively included in this study. Informed consent was signed by the patients, and this study was approved by the ethics committee of Bhayangkara Brimob Hospital. This study follows the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guideline. The sequelae of COVID-19 were those reported since the patient was declared negative by a PCR swab and had completed self-isolation or hospitalization for 10 days plus three days at the hospital, as recommended by the World Health Organization and the local Ministry of Health. The data collected were self-reported symptoms that appeared from when the patient was declared

recovered from COVID-19 until 90 days later. The data were obtained from various cities in Indonesia.

A total of 214 patients who had been declared recovered from COVID-19 were contacted between January and March 2021 to complete a single electronic questionnaire between one month and three months after being declared recovered. Thirteen participants who did not complete the questionnaire were not included in the analysis. We performed only descriptive analysis due to the small number of participants. Data analysis was conducted using SPSS 23.

Results

A total of 201 participants, took part from Indonesia and were of Asian ethnicity with an average age of 39.35 years old; the participants included 109 (54.2%) males and 92 (45.8%) females with confirmed COVID-19 infection. A total of 19 COVID-19 patients (9.45%) had had no symptoms, 58 (28.85%) patients had undergone self-isolation, and 143 (71%) had required hospitalization (Table 1). Hypertension and diabetes mellitus were the most common comorbidities found in 31 patients (15.42%). A total of 17 (8.46%) participants were active smokers.

Overall, 127 of the 201 (63.18%) patients reported having experienced sequelae (Table 1). Of these 127 patients, sequelae were reported by 61 patients (48.03%) aged 18–39 years, 63 patients (49.60%) aged 40–64 years, and three patients (2.36%) aged ≥ 65 years. A total of 89 participants (62.2%) with sequelae had been hospitalized, and 38 (65.51%) had independently self-isolated. Sequelae were reported by 19 (9.45%) patients who initially had no symptoms, but after PCR was negative and they had completed self-isolation, persistent symptoms appeared and were believed not to derive from another illness condition. Some symptoms appeared to be dominant in the

patient's report. A total of 15 out of 31 (48.39%) patients with hypertension or diabetes (comorbidities) had persistent symptoms to date.

The most frequently reported sequelae were excessive fatigue (69/127 patients [54.33%]), difficulty concentrating (34/127 [26.77%]), and cough (33/127 patients [25.98%]) (Figure 1). A total of 83 (41.35%) participants experienced sequelae for 1–2 months, and 44 (21.9%) people experienced sequelae for three or more months (Figure 2). Overall, 47 out of 201 (23.38%) participants who had undergone self-isolation or who had been hospitalized reported a decrease in quality of life compared to three participants who had no symptoms (7.1%).

Discussion

In this study, patients were studied at three months after being discharged from hospital or declared recovered. A total of 127 (63.18%) patients reported sequelae that were still felt after being declared recovered with negative PCR confirmation. Eighty people (39.8%) reported sequelae lasting less than 1 month. A total of 38 people (18.9%) reported sequelae lasting around 1–2 months, and nine (4.5%) experienced sequelae ≥ 3 months after being discharged from hospital or being declared recovered. Approximately 143 (71.14%) of the participants in our study had been hospitalized for COVID-19. Sequelae experienced for more than 1 month were reported by 33 (23.1%) of patients who were hospitalized. A study by Sudre et al. stated that as many as 20.1% of participants with COVID-19 still experienced symptoms and who had recovered from COVID-19 for more than 28 days to more than 12 weeks.³

The most reported sequelae in our study were excessive fatigue (69 of 127 patients [54.33%]), difficulty concentrating (34 of 127 patients [26.77%]), and cough (33 of 127 patients [25.98%]). A total of 83 (41.3%) participants experienced 1–2 sequelae symptoms, and 44 (21.9%) people

experienced ≥ 3 sequelae. Fourteen out of 27 (51.85%) comorbid patients who had been hospitalized had persistent symptoms for more than 1 month. Garrigues et al revealed that the most reported persistent symptoms were fatigue (55%), shortness of breath (42%), loss of memory (34%), and impaired concentration and sleep (28% and 30.8%, respectively). Comparison of the persistent symptoms that occurred between the usual isolation-treated patients and the patients who received ICU care was statistically significant. Many symptoms persist several months after hospitalization for COVID-19. While there were few differences between health related quality of life (HRQoL) between ward and ICU patients.⁴ A study by Carfi et al. revealed that 87.4% of patients reported persistent symptoms of at least one symptom, especially fatigue and shortness of breath.⁵

A decrease in quality of life was reported in this study, with 47 patients (23.4%) from the total group of participants and 34 (23.8%) of the hospitalized patients experiencing a decrease in quality of life. Logue et al. also reported impaired quality of life in 30.7% of outpatients who had self-isolated.⁶

This study is limited because of its small sample size. Although the respondents involved in this study came from several regions in Indonesia, the locations were not included in the analysis. There is potential for bias in reporting symptoms during the post-recovery period of up to three months. This study only analyzed symptoms that were observed and followed up with questionnaire completed by the patients, more than three months after recovery and which were not observed during hospitalization or self-isolation. This study also did not differentiate between isolation room in hospital and ICU inpatient care but only between patients who self-isolated and hospitalized patients. Our study shows that the sequelae of COVID-19 are still felt by patients even after being discharged from hospital when the PCR results are negative, thus affecting the

participants' quality of life. This study is an initial report of the sequelae that are still felt by patients after recovery from COVID-19 in Indonesia.

ACKNOWLEDGMENT

The authors would like to thank Scribendi (scribendi.com) for the English language review.

FUNDING

No funding.

CONFLICT OF INTEREST

The authors declare no conflict of interest for this article.

AUTHOR CONTRIBUTIONS

Conceptualization : Desdiani Desdiani

Formal analysis: Desdiani Desdiani, Auditya Purwandini Sutarto

Investigation: Alfathul Nur Kharisma, Hera Safitri, Amalia Fitri Hakim, Salsabila Hanifa Rusyda

Project Administration: Desdiani Desdiani

Resources: Desdiani Desdiani, Auditya Purwandini Sutarto, Hera Safitri

Supervision: Desdiani Desdiani

Visualization: Hera Safitri, Amalia Fitri Hakim, Salsabila Hanifa Rusyda

Writing - Original Draft Preparation: Desdiani Desdiani, Amalia Fitri Hakim, Salsabila Hanifa Rusyda

Writing – Review & Editing: Desdiani Desdiani, Auditya Purwandini Sutarto, Amalia Fitri Hakim, Salsabila Hanifa Rusyda

All authors had read and approved the final version of the manuscript.

Desdiani Desdiani had full access to all of the data in this study and takes complete responsibility for the integrity of the data and the accuracy of the data analysis

TRANSPARENCY STATEMENT

Desdiani Desdiani confirms that the manuscript is a honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

DATA AVAILABILITY STATEMENT

The authors confirm that the data supporting the findings of this study are available within the article and its supplementary materials.

ORCID

Desdiani Desdiani <https://orcid.org/0000-0002-5907-9476>

REFERENCES

1. Del Rio C, Collins LF, Malani P. Long-term health consequences of COVID-19. *JAMA*. Publish online October 5, 2020. doi:10.1001/jama.2020.19719
2. Task Force for Handling COVID-19. Map of the Distribution of COVID-19 [Internet] Indonesia; 2021. [updated 2021; cited 2021 April 20]. Available from <https://covid19.go.id/peta-sebaran>.
3. Sudre CH, Murray B, Varsavsky T, Graham MS, Penfold RS, Bowyer RC, et al. Attributes and predictors of long COVID. *Nature Medicine* [Internet]. 2021 Mar 10 [cited 2021 Apr 29];27(4):626–31. Available from: <https://www.nature.com/articles/s41591-021-01292-y>
4. Garrigues E, Janvier P, Kherabi Y, Le Bot A, Hamon A, Gouze H, et al. Post-discharge persistent symptoms and health-related quality of life after hospitalization for COVID-19. *Journal of Infection* [Internet]. 2020 Dec [cited 2021 Apr 29];81(6):e4–6. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7445491/>

5. Carfi A, Bernabei R, Landi F. Persistent symptoms in patients after acute COVID-19. *JAMA*.2020. 11;324(6):603-605. doi: 10.1001/jama.2020.12603
6. Logue JK, Franko NM, McCulloch DJ, McDonald D, Magedson A, Wolf CR, et al. Sequelae in Adults at 6 Months After COVID-19 Infection. *JAMA Network Open* [Internet]. 2021 Feb 19 [cited 2021 Apr 29];4(2):e210830. Available from: <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2776560>

Table 1. Demographic and Clinical Characteristics of the Study Participants

Characteristics	Total recovered individuals (n = 201)	Inpatient (n = 143)	No. %	
			Symptomatic (n = 39)	Outpatient Asymptomatic individuals (n = 19)
Age, mean (SD)	39.35 (11.56)	39.1	40.2	39.6
Sex				
Women	92 (45.8)	57 (39.9)	27 (69.2)	8 (42.1)
Men	109 (54.2)	86 (60.1)	12 (30.8)	11 (57.9)
BMI, mean (SD)*	26.3	26.3	26.5	26.3
Comorbidities				
Hypertension	19 (9.45)	18 (12.59)	1 (2.6)	0 (0.0)
Diabetes	12 (5.97)	9 (6.29)	3 (7.7)	0 (0.0)
Active smoker	17 (8.46)	13 (9.09)	1 (2.6)	3 (15.8)
Duration of persistent symptoms (month)				
0	80 (39.8)	56 (39.2)	17 (43.6)	7 (36.8)
1–2	38 (18.9)	28 (19.6)	10 (25.6)	0 (0.0)
≥ 3	9 (4.5)	5 (3.5)	2 (5.12)	2 (10.5)
Missing	74 (36.8)	54 (37.8)	10 (25.6)	10 (52.6)
Worse quality of life	47 (23.4)	34 (23.8)	12 (30.8)	1 (5.3)
Symptoms (post- COVID follow-up)	127 (63.18)	89 (62.2)	27 (69.2)	11 (57.9)
Excessive fatigue/tiredness	69 (54.3)	44 (49.4)	21 (53.8)	4 (21.0)
Dyspnea/shortness of breath	26 (20.47)	18 (20.2)	5 (12.8)	3 (15.8)
Sleep disorders	25 (16.68)	17 (19.1)	7 (17.9)	1 (5.3)
Emotional instability	22 (17.3)	18 (20.2)	4 (10.3)	0 (0.0)
Difficulty concentrating	34 (26.77)	16 (17.97)	14 (35.9)	4 (21.0)
Digestive problems	25 (19.68)	16 (17.97)	8 (20.5)	1 (5.3)
Loss of appetite	9 (7.09)	7 (7.86)	2 (5.1)	0 (0.0)
Loss of smell	10 (7.84)	5 (5.61)	3 (7.7)	2 (10.5)
Muscle pain	24 (11.94)	23 (25.84)	1 (2.6)	0 (0.0)

Sore throat	8 (6.3)	7 (7.86)	1 (2.6)	0 (0.0)
Cough	33 (25.98)	25 (28.1)	7 (17.9)	1 (5.3)
Cold	19 (14.96)	16 (17.97)	3 (7.7)	0 (0.0)
Diarrhea	2 (1.57)	1 (1.1)	0 (0.0)	1 (5.3)
Earache	1 (0.79)	0 (0.0)	1 (2.6)	0 (0.0)
Sweating	15 (11.81)	14 (15.7)	1 (2.6)	0 (0.0)
Burning sensation on the skin	8 (6.3)	5 (5.6)	3 (7.7)	0 (0.0)
Chills	2 (1.57)	2 (2.25)	0 (0.0)	0 (0.0)
Felt feverish	13 (10.23)	13 (14.6)	0 (0.0)	0 (0.0)
Nausea	7 (5.51)	7 (7.86)	0 (0.0)	0 (0.0)

*BMI : Body Mass Index; SD : Standard Deviation

Table 2. Number of symptoms

Persistent symptoms	No. (%)
No symptoms	74 (36.8)
1-2 symptoms	83 (41.3)
≥3 symptoms	44 (21.9)

Editor to Author 26 Oktober 2021

HSR-2021-05-0438.R1

Dari: Health Science Report (healthsciencereports@wiley.com)

Kepada: desdiani@ymail.com

Tanggal: Selasa, 26 Oktober 2021 pukul 09.10 WIB

Dear Dr. Desdiani,

Hope you are doing good.


I am writing this e-mail regarding the submission HSR-2021-05-0438.R1. I have attached the main document and table.

Table 2 has not been cited in the main document. While returning the files, please include the tables within the main document.

Thank you very much.

Best regards,
Magesh (For Ronald)

Dr. Ronald Nathanael
Editorial Assistant
Health Science Reports
healthsciencereports@wiley.com

 Table_HSR (1).docx
15.8kB


 Sequelae_in_COVID-19_Patients_Final_.docx
32kB

Table added 26 Oktober 2021

Re: HSR-2021-05-0438.R1

Dari: desdiani - (desdiani@ymail.com)

Kepada: healthsciencereports@wiley.com

Tanggal: Selasa, 26 Oktober 2021 pukul 09.54 WIB

Dear Dr. Ronald Nathanael,

Here we submit table 1 and table 2 within the main document via email, because there is no option for resubmit in author dashboard.health science report. Thank you for your attention.

Best Regards,
Desdiani Desdiani

Pada Selasa, 26 Oktober 2021 09.10.53 GMT+7, Health Science Report <healthsciencereports@wiley.com> menulis:

Dear Dr. Desdiani,

Hope you are doing good.


I am writing this e-mail regarding the submission HSR-2021-05-0438.R1. I have attached the main document and table.

Table 2 has not been cited in the main document. While returning the files, please include the tables within the main document.

Thank you very much.

Best regards,
Magesh (For Ronald)

Dr. Ronald Nathanael
Editorial Assistant
Health Science Reports
healthsciencereports@wiley.com

 Sequelae_in_COVID-19_Patients_Final_Rev.docx
41kB

Manuscript Revisions

Sequelae in COVID-19 Patients Three Months after Hospital Discharge or Completion of Self-Isolation

Desdiani Desdiani^{1,2}, Auditya Purwandini Sutarto³, Alfathul Nur Kharisma⁴, Hera Safitri⁵, Amalia Fitri Hakim¹, Salsabila Hanifa Rusyda¹

¹Faculty of Medicine, Universitas Sultan Ageng Tirtayasa, Cilegon, Banten, Indonesia

²Department of Pulmonology and Respiratory Medicine, Bhayangkara Brimob Hospital, Cimanggis, Depok, Indonesia

³Department of Industrial Engineering, Universitas Qomaruddin Gresik, Jln Raya Bungah no 1 Gresik, East Java, Indonesia

⁴Faculty of Medicine, Universitas Sriwijaya, Palembang, Indonesia

⁵Faculty of Medicine, Universitas Andalas, Padang, Indonesia

***Corresponding author:**

Desdiani Desdiani

Faculty of Medicine, Universitas Sultan Ageng Tirtayasa, Jalan Jend. Sudirman No.20, RT.10/RW.5, Kotabumi, Cilegon, Banten, Indonesia 42434.

Tel +62254280330, Fax: +62254281254

E-mail : desdiani@ymail.com

Running Head: Sequelae in COVID-19 Patients

Introduction

Many patients experience post-COVID-19 sequelae that lead to impaired quality of life after recovering from COVID-19.¹ To date, there have been 1,657,035 cases of COVID-19, with 45,116 dead and 1,511,417 recovered in Indonesia.² We assessed sequelae in COVID-19 patients and most common sequelae, both those who had self-isolated and those who were hospitalized, who had recovered for more than three months after negative Polymerase Chain Reaction (PCR) swab results. COVID-19 Sequelae is persistent symptomatology and outcomes after hospital discharge or completion of self-isolation with a wide and multifaceted range of clinical manifestations were identified, including respiratory, gastrointestinal, neurological, cardiovascular symptoms, and other organ manifestations.¹

Methods

This study by the Faculty of Medicine, Sultan Ageng Tirtayasa University assessed the sequelae of adult patients who confirmed positive for COVID-19 infection based on PCR examination, who had undergone self-isolation or hospitalization and had been declared recovered for more than three months. These sequelae is persistent symptoms that develop during or following a confirmed case of COVID-19 and that continue for >28 days. The patients were retrospectively included in this study. Informed consent was signed by the patients, and this study was approved by the ethics committee of Bhayangkara Brimob Hospital. This study follows the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guideline. The sequelae of COVID-19 were those reported since the patient was declared negative by a PCR swab and had completed self-isolation or hospitalization for 10 days plus three days at the hospital, as

recommended by the World Health Organization and the local Ministry of Health. The data collected were self-reported symptoms that appeared from when the patient was declared recovered from COVID-19 until 90 days later. The data were obtained from various cities in Indonesia.

A total of 214 patients who had been declared recovered from COVID-19 were contacted between January and March 2021 to complete a single electronic questionnaire between one month and three months after being declared recovered. Thirteen participants who did not complete the questionnaire were not included in the analysis. We performed only descriptive analysis due to the small number of participants. Data analysis was conducted using SPSS 23.

Results

A total of 201 participants, took part from Indonesia and were of Asian ethnicity with an average age of 39.35 years old; the participants included 109 (54.2%) males and 92 (45.8%) females with confirmed COVID-19 infection. A total of 19 COVID-19 patients (9.45%) had had no symptoms, 58 (28.85%) patients had undergone self-isolation, and 143 (71%) had required hospitalization (Table 1). Hypertension and diabetes mellitus were the most common comorbidities found in 31 patients (15.42%). A total of 17 (8.46%) participants were active smokers.

Overall, 127 of the 201 (63.18%) patients reported having experienced sequelae (Table 1). Of these 127 patients, sequelae were reported by 61 patients (48.03%) aged 18–39 years, 63 patients (49.60%) aged 40–64 years, and three patients (2.36%) aged ≥ 65 years. A total of 89 participants (62.2%) with sequelae had been hospitalized, and 38 (65.51%) had independently self-isolated. Sequelae were reported by 19 (9.45%) patients who initially had no symptoms, but after PCR was negative and they had completed self-isolation, persistent symptoms appeared and were believed

not to derive from another illness condition. Some symptoms appeared to be dominant in the patient's report. A total of 15 out of 31 (48.39%) patients with hypertension or diabetes (comorbidities) had persistent symptoms to date.

Table 1. Demographic and Clinical Characteristics of the Study Participants

Characteristics	Total recovered individuals (n = 201)	Inpatient (n = 143)	No. %	
			Symptomatic (n = 39)	Asymptomatic individuals (n = 19)
Age, mean (SD)	39.35 (11.56)	39.1	40.2	39.6
Sex				
Women	92 (45.8)	57 (39.9)	27 (69.2)	8 (42.1)
Men	109 (54.2)	86 (60.1)	12 (30.8)	11 (57.9)
BMI, mean (SD)*	26.3	26.3	26.5	26.3
Comorbidities				
Hypertension	19 (9.45)	18 (12.59)	1 (2.6)	0 (0.0)
Diabetes	12 (5.97)	9 (6.29)	3 (7.7)	0 (0.0)
Active smoker	17 (8.46)	13 (9.09)	1 (2.6)	3 (15.8)
Duration of persistent symptoms (month)				
0	80 (39.8)	56 (39.2)	17 (43.6)	7 (36.8)
1-2	38 (18.9)	28 (19.6)	10 (25.6)	0 (0.0)
≥ 3	9 (4.5)	5 (3.5)	2 (5.12)	2 (10.5)
Missing	74 (36.8)	54 (37.8)	10 (25.6)	10 (52.6)
Worse quality of life	47 (23.4)	34 (23.8)	12 (30.8)	1 (5.3)
Symptoms (post-COVID follow-up)	127 (63.18)	89 (62.2)	27 (69.2)	11 (57.9)
Excessive fatigue/tiredness	69 (54.3)	44 (49.4)	21 (53.8)	4 (21.0)
Dyspnea/shortness of breath	26 (20.47)	18 (20.2)	5 (12.8)	3 (15.8)
Sleep disorders	25 (16.68)	17 (19.1)	7 (17.9)	1 (5.3)
Emotional instability	22 (17.3)	18 (20.2)	4 (10.3)	0 (0.0)
Difficulty concentrating	34 (26.77)	16 (17.97)	14 (35.9)	4 (21.0)

Digestive problems	25 (19.68)	16 (17.97)	8 (20.5)	1 (5.3)
Loss of appetite	9 (7.09)	7 (7.86)	2 (5.1)	0 (0.0)
Loss of smell	10 (7.84)	5 (5.61)	3 (7.7)	2 (10.5)
Muscle pain	24 (11.94)	23 (25.84)	1 (2.6)	0 (0.0)
Sore throat	8 (6.3)	7 (7.86)	1 (2.6)	0 (0.0)
Cough	33 (25.98)	25 (28.1)	7 (17.9)	1 (5.3)
Cold	19 (14.96)	16 (17.97)	3 (7.7)	0 (0.0)
Diarrhea	2 (1.57)	1 (1.1)	0 (0.0)	1 (5.3)
Earache	1 (0.79)	0 (0.0)	1 (2.6)	0 (0.0)
Sweating	15 (11.81)	14 (15.7)	1 (2.6)	0 (0.0)
Burning sensation on the skin	8 (6.3)	5 (5.6)	3 (7.7)	0 (0.0)
Chills	2 (1.57)	2 (2.25)	0 (0.0)	0 (0.0)
Felt feverish	13 (10.23)	13 (14.6)	0 (0.0)	0 (0.0)
Nausea	7 (5.51)	7 (7.86)	0 (0.0)	0 (0.0)

*BMI : Body Mass Index; SD : Standard Deviation

Table 2. Number of symptoms

Persistent symptoms	No. (%)
No symptoms	74 (36.8)
1–2 symptoms	83 (41.3)
≥ 3 symptoms	44 (21.9)

The most frequently reported sequelae were excessive fatigue (69/127 patients [54.33%]), difficulty concentrating (34/127 [26.77%]), and cough (33/127 patients [25.98%]) (Figure 1). A total of 83 (41.35%) participants experienced sequelae for 1–2 months, and 44 (21.9%) people experienced sequelae for three or more months (Table 2 and Figure 2). Overall, 47 out of 201 (23.38%) participants who had undergone self-isolation or who had been hospitalized reported a decrease in quality of life compared to three participants who had no symptoms (7.1%).

Discussion

In this study, patients were studied at three months after being discharged from hospital or declared recovered. A total of 127 (63.18%) patients reported sequelae that were still felt after being declared recovered with negative PCR confirmation. Eighty people (39.8%) reported sequelae lasting less than 1 month. A total of 38 people (18.9%) reported sequelae lasting around 1–2 months, and nine (4.5%) experienced sequelae ≥ 3 months after being discharged from hospital or being declared recovered. Approximately 143 (71.14%) of the participants in our study had been hospitalized for COVID-19. Sequelae experienced for more than 1 month were reported by 33 (23.1%) of patients who were hospitalized. A study by Sudre et al. stated that as many as 20.1% of participants with COVID-19 still experienced symptoms and who had recovered from COVID-19 for more than 28 days to more than 12 weeks.³

The most reported sequelae in our study were excessive fatigue (69 of 127 patients [54.33%]), difficulty concentrating (34 of 127 patients [26.77%]), and cough (33 of 127 patients [25.98%]). A total of 83 (41.3%) participants experienced 1–2 sequelae symptoms, and 44 (21.9%) people experienced ≥ 3 sequelae. Fourteen out of 27 (51.85%) comorbid patients who had been hospitalized had persistent symptoms for more than 1 month. Garrigues et al revealed that the most reported persistent symptoms were fatigue (55%), shortness of breath (42%), loss of memory (34%), and impaired concentration and sleep (28% and 30.8%, respectively). Comparison of the persistent symptoms that occurred between the usual isolation-treated patients and the patients who received ICU care was statistically significant. Many symptoms persist several months after hospitalization for COVID-19. While there were few differences between health related quality of life (HRQoL) between ward and ICU patients.⁴ A study by Carfi et al. revealed that 87.4% of patients reported persistent symptoms of at least one symptom, especially fatigue and shortness of breath.⁵

A decrease in quality of life was reported in this study, with 47 patients (23.4%) from the total group of participants and 34 (23.8%) of the hospitalized patients experiencing a decrease in quality of life. Logue et al. also reported impaired quality of life in 30.7% of outpatients who had self-isolated.⁶

In the case of health workers who work in the operating room, the risk of contracting COVID-19 can have serious consequences. The importance of proper PPE use, reorganization of the operating schedule, use of safe operating techniques, and user-friendly surgical equipment are all good ways to avoid smoke production.⁷ Surgical team members responded to the COVID-19 pandemic with leadership and crisis management principles. Current recommendations are widely adopted in terms of organizational aspects and surgical management.⁸ The Surgery Departments implemented changes, including reorganizing surgical schedules, staff preparation, and the departments outbreak response policies and suggestions for surgical techniques and risk management.⁹ Surgeons reported that their apparent lack of safety and comfort, as well as increased fatigue, may have hampered their ability to perform at their best throughout surgery.¹⁰

This study is limited because of its small sample size. Although the respondents involved in this study came from several regions in Indonesia, the locations were not included in the analysis. There is potential for bias in reporting symptoms during the post-recovery period of up to three months. This study only analyzed symptoms that were observed and followed up with questionnaire completed by the patients, more than three months after recovery and which were not observed during hospitalization or self-isolation. This study also did not differentiate between isolation room in hospital and ICU inpatient care but only between patients who self-isolated and hospitalized patients. Our study shows that the sequelae of COVID-19 are still felt by patients even after being discharged from hospital when the PCR results are negative, thus affecting the

participants' quality of life. This study is an initial report of the sequelae that are still felt by patients after recovery from COVID-19 in Indonesia.

ACKNOWLEDGMENT

The authors would like to thank Scribendi (scribendi.com) for the English language review.

FUNDING

No funding.

CONFLICT OF INTEREST

The authors declare no conflict of interest for this article.

AUTHOR CONTRIBUTIONS

Conceptualization : Desdiani Desdiani

Formal analysis: Desdiani Desdiani, Auditya Purwandini Sutarto

Investigation: Alfathul Nur Kharisma, Hera Safitri, Amalia Fitri Hakim, Salsabila Hanifa Rusyda

Project Administration: Desdiani Desdiani

Resources: Desdiani Desdiani, Auditya Purwandini Sutarto, Hera Safitri

Supervision: Desdiani Desdiani

Visualization: Hera Safitri, Amalia Fitri Hakim, Salsabila Hanifa Rusyda

Writing - Original Draft Preparation: Desdiani Desdiani, Amalia Fitri Hakim, Salsabila Hanifa Rusyda

Writing – Review & Editing: Desdiani Desdiani, Auditya Purwandini Sutarto, Amalia Fitri Hakim, Salsabila Hanifa Rusyda

All authors had read and approved the final version of the manuscript.

Desdiani Desdiani had full access to all of the data in this study and takes complete responsibility for the integrity of the data and the accuracy of the data analysis

TRANSPARENCY STATEMENT

Desdiani Desdiani confirms that the manuscript is a honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

DATA AVAILABILITY STATEMENT

The authors confirm that the data supporting the findings of this study are available within the article and its supplementary materials.

ORCID

Desdiani Desdiani <https://orcid.org/0000-0002-5907-9476>

REFERENCES

1. Del Rio C, Collins LF, Malani P. Long-term health consequences of COVID-19. *JAMA*. Publish online October 5, 2020. doi:10.1001/jama.2020.19719
2. Task Force for Handling COVID-19. Map of the Distribution of COVID-19 [Internet] Indonesia; 2021. [updated 2021; cited 2021 April 20]. Available from <https://covid19.go.id/peta-sebaran>.
3. Sudre CH, Murray B, Varsavsky T, Graham MS, Penfold RS, Bowyer RC, et al. Attributes and predictors of long COVID. *Nature Medicine* [Internet]. 2021 Mar 10 [cited 2021 Apr 29];27(4):626–31. Available from: <https://www.nature.com/articles/s41591-021-01292-y>
4. Garrigues E, Janvier P, Kherabi Y, Le Bot A, Hamon A, Gouze H, et al. Post-discharge persistent symptoms and health-related quality of life after hospitalization for COVID-19. *Journal of Infection* [Internet]. 2020 Dec [cited 2021 Apr 29];81(6):e4–6. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7445491/>

5. Carfi A, Bernabei R, Landi F. Persistent symptoms in patients after acute COVID-19. *JAMA*. 2020. 11;324(6):603-605. doi: 10.1001/jama.2020.12603
6. Logue JK, Franko NM, McCulloch DJ, McDonald D, Magedson A, Wolf CR, et al. Sequelae in Adults at 6 Months After COVID-19 Infection. *JAMA Network Open* [Internet]. 2021 Feb 19 [cited 2021 Apr 29];4(2):e210830. Available from: <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2776560>
7. Benítez CY, Ribeiro MAF Jr, Alexandrino H, Koleda P, Baptista SF, Azfar M, Di Saverio S, Ponchietti L, Güemes A, Blas JL, Mesquita C. International cooperation group of emergency surgery during the COVID-19 pandemic. *Eur J Trauma Emerg Surg*. 2021 Jun;47(3):621-629. doi: 10.1007/s00068-020-01521-y. Epub 2020 Oct 13. PMID: 33047158; PMCID: PMC7550249.
8. Benitez CY, Pedival AN, Talal I, Cros B, Ribeiro MAF, Azfar M, Saverio SD, Laina JLB. Adapting to an unprecedented scenario: surgery during the COVID-19 outbreak. *Rev Col Bras Cir*. 2020;47:e20202701. Portuguese, English. doi: 10.1590/0100-6991e-20202701. Epub 2020 Aug 12. PMID: 32844915.
9. Benítez CY, Güemes A, Aranda J, Ribeiro M, Ottolino P, Di Saverio S, Alexandrino H, Ponchietti L, Blas JL; International Cooperation Group on PPE and Emergency Surgery, Ramos JP, Rangelova E, Muñoz M, Yáñez C Sr. Impact of Personal Protective Equipment on Surgical Performance During the COVID-19 Pandemic. *World J Surg*. 2020 Sep;44(9):2842-2847. doi: 10.1007/s00268-020-05648-2. PMID: 32564140; PMCID: PMC7305697.
10. Di Saverio S, Pata F, Khan M, Ietto G, Zani E, Carcano G. Convert to open: the new paradigm for surgery during COVID-19? *Br J Surg*. 2020 Jun;107(7):e194. doi: 10.1002/bjs.11662. Epub 2020 May 5. PMID: 32367551; PMCID: PMC7267491.

Manuscript Accepted 11 November 2021

8/12/23, 2:46 PM

Yahoo Mail - Manuscript Accepted - Updates Approved HSR-2021-05-0438.R1 [email ref: ENR-AW-1-e]

Manuscript Accepted - Updates Approved HSR-2021-05-0438.R1 [email ref: ENR-AW-1-e]

Dari: HealthScienceReports Journal Admin (onbehalf@manuscriptcentral.com)

Kepada: desdiani@ymail.com

Tanggal: Kamis, 11 November 2021 pukul 19.01 WIB

11-Nov-2021

Dear Dr. Desdiani:

Manuscript id: HSR-2021-05-0438.R1

The final files that you submitted for your manuscript have been checked and have been found to be suitable for publication and so will be forwarded to the publisher shortly.

Sincerely,
Health Science Reports Editorial Office

Article In Production

8/16/23, 11:01 AM

Yahoo Mail - In Production: Your article accepted in Health Science Reports

In Production: Your article accepted in Health Science Reports

Dari: cs-author@wiley.com

Kepada: desdiani@ymail.com

Tanggal: Jumat, 12 November 2021 pukul 17.14 GMT+7

Dear Desdiani Desdiani,

Article ID: HSR2444

Article DOI: 10.1002/hsr2.444

Internal Article ID: 17255988

Article: Sequelae in COVID-19 Patients Three Months after Hospital Discharge or Completion of Self-Isolation

Journal: Health Science Reports

Congratulations on the acceptance of your article for publication in Health Science Reports.

Your article has been received and the production process is now underway. We look forward to working with you and publishing your article. Using Wiley Author Services, you can track your article's progress.

Please click below to login - if you are using a different email address than this one, you will need to manually assign this article to your Dashboard (see [How do I assign a missing article to My Dashboard?](#)):

https://authorservices.wiley.com/index.html#login?campaign=email_invitation-exists

If applicable, a list of available actions will appear below – check out your Author Services Dashboard for all actions related to your articles.

Sign your license agreement (REQUIRED) -- you will receive an email when this task is ready on your dashboard.

Pay your article publication charge (REQUIRED)

Track your article's progress to publication

Access your published article

If you need any assistance, please click [here](#) to view our Help section.

Sincerely,
Wiley Author Services

P.S. – This journal accepts artwork submissions for Cover Images. This is an optional service you can use to help increase article exposure and showcase your research. Pricing and placement options vary by journal. For more information, including artwork guidelines, pricing, and submission details, please visit the [Journal Cover Image](#) page.

License was Successfully Submitted 13 November 2021

8/16/23, 10:59 AM

Yahoo Mail - License was successfully submitted! Thank you!

License was successfully submitted! Thank you!

Dari: cs-author@wiley.com

Kepada: desdiani@ymail.com

Tanggal: Sabtu, 13 November 2021 pukul 01.47 GMT+7

Dear Desdiani Desdiani,

Article ID: HSR2444

Article DOI: 10.1002/hsr2.444

Internal Article ID: 17255988

Article: Sequelae in COVID-19 Patients Three Months after Hospital Discharge or Completion of Self-Isolation

Journal: Health Science Reports

You've successfully completed license signing for your article – thank you! You can view your signed agreement at any time by visiting your [Wiley Author Services Dashboard](#).

Sincerely,

Wiley Author Services

Information : Production

8/16/23, 11:05 AM

Yahoo Mail - Information: Production Editor Contact Health Science Reports | Sequelae in COVID-19 Patients Three Months after...

Information: Production Editor Contact Health Science Reports | Sequelae in COVID-19 Patients Three Months after Hospital Discharge or Completion of Self-Isolation

Dari: bi-wiley@straive.com

Kepada: desdiani@ymail.com

Tanggal: Kamis, 25 November 2021 pukul 19.58 GMT+7

Dear Dr. Desdiani Desdiani,

We are in the process of preparing "Sequelae in COVID-19 Patients Three Months after Hospital Discharge or Completion of Self-Isolation" for publication. Your production editor, Elora Alcoran Jane, will support you and your article throughout the process.

Please get in touch with your Production Editor at ejalcoran@wiley.com; Mitchie.Balacanao@straive.com if you have any questions.

Sincerely,
Booking-in Team,
On behalf of Wiley

Article ID: HSR2_444
Article DOI: 10.1002/HSR2.444

8/16/23, 11:06 AM

Yahoo Mail - Action: Proof of HSR2_EV_HSR2444 for Health Science Reports ready for review

Action: Proof of HSR2_EV_HSR2444 for Health Science Reports ready for review

Dari: Wiley Online Proofing (onlineproofing@eproofing.in)

Kepada: desdiani@ymail.com

Tanggal: Selasa, 30 November 2021 pukul 00.52 GMT+7

Review your proof

Dear **Dr. Desdiani Desdiani**,

The proof of your **Health Science Reports** article **Sequelae in COVID-19 patients 3 months after hospital discharge or completion of self-isolation** is now available for review:

[Edit Article](#)

To review your article, please complete the following steps, ideally within 48 hours*, so we can publish your article as quickly as possible.

1. Open your proof in the online proofing system using the button above.
2. Check the article for correctness and respond to all queries. For instructions on using the system, please see the "Help" menu in the upper right corner.
3. Submit your changes by clicking the "Submit" button in the proofing system.
4. Don't forget to pay your open access Article Publication Charge (APC). We can't publish your article without it. LOG IN TO PAY (BUTTON/Link <https://authorservices.wiley.com/index.html#dashboard>)

Helpful Tips

- Your manuscript has been formatted following the style requirements for the journal. Any requested changes that go against journal style will not be made.
- Your proof will include queries. These must be replied to using the system before the proof can be submitted.
- The only acceptable changes at this stage are corrections to grammatical errors or data accuracy, or to provide higher resolution figure files (if requested by the typesetter).

- Any changes to scientific content or authorship will require editorial review and approval.
- Once your changes are complete, submit the article after which no additional corrections can be requested.
- Most authors complete their corrections within 48 hours. Returning any corrections promptly will accelerate publication of your article.

If you encounter any problems or have questions, please contact the production office at (hsr2@wiley.com). For the quickest response, include the journal name and your article ID (found in the subject line) in all correspondence.

Best regards,
Health Science Reports Production Office

* We appreciate that the COVID-19 pandemic may create conditions for you that make it difficult for you to review your proof within standard timeframes. If you have any problems keeping to this schedule, please reach out to me at (hsr2@wiley.com) to discuss alternatives.

Correction Submitted 30 November 2021

8/16/23, 11:08 AM

Yahoo Mail - Corrections successfully submitted for HSR2_EV_HSR2444, Sequelae in COVID-19 patients 3 months after hospita...

Corrections successfully submitted for HSR2_EV_HSR2444, Sequelae in COVID-19 patients 3 months after hospital discharge or completion of self-isolation.

Dari: Wiley Online Proofing (notifications@eproofing.in)

Kepada: desdiani@ymail.com

Cc: hsr2@wiley.com

Tanggal: Selasa, 30 November 2021 pukul 05.15 GMT+7

Corrections successfully submitted

Dear **Dr. Desdiani Desdiani**,

Thank you for reviewing the proof of the **Health Science Reports** article **Sequelae in COVID-19 patients 3 months after hospital discharge or completion of self-isolation**.

[View Article](#)

This is a read-only version of your article with the corrections you have marked up.

If you encounter any problems or have questions please contact us at (hsr2@wiley.com). For the quickest response include the journal name and your article ID (found in the subject line) in all correspondence.

Best regards,
Health Science Reports

Article Published 22 Desember 2021

8/16/23, 11:09 AM

Yahoo Mail - Published: Your article is published in an issue

Published: Your article is published in an issue

Dari: cs-author@wiley.com

Kepada: desdiani@ymail.com

Tanggal: Rabu, 22 Desember 2021 pukul 13.14 GMT+7

Dear Desdiani Desdiani,

Your article *Sequelae in COVID-19 Patients Three Months after Hospital Discharge or Completion of Self-Isolation in Health Science Reports* has the following publication status: Published in Issue

To access your article, please click the following link to register or log in:

<https://authorservices.wiley.com/index.html#register>

You can also access your published article via this link: <http://dx.doi.org/10.1002/hsr2.444>

If you need any assistance, please click [here](#) to view our Help section.

Sincerely,

Wiley Author Services

To unsubscribe from these emails, [click here](#).

Article Published Online 22Desember 2021

8/15/23, 11:11 AM

Yahoo Mail - Published: Your article is now published online!

Published: Your article is now published online!

Dari: cs-author@wiley.com

Kepada: desdiani@ymail.com

Tanggal: Rabu, 22 Desember 2021 pukul 21.09 GMT+7

Dear Desdiani Desdiani,

Your article *Sequelae in COVID-19 Patients Three Months after Hospital Discharge or Completion of Self-Isolation in Health Science Reports* has the following publication status: Published Online

To access and share your article, please click the following link to register or log in:

<https://authorservices.wiley.com/index.html#register>

You can also access your published article via this link: <http://doi.org/10.1002/hsr2.444>

If you need any assistance, please click [here](#) to view our Help section.

Sincerely,

Wiley Author Services

To unsubscribe from these emails, [click here](#).

RESEARCH LETTER | Open Access |

Sequelae in COVID-19 patients 3 months after hospital discharge or completion of self-isolation

Desdiani Desdiani Auditya Purwandini Sutarto, Alfathul Nur Kharisma, Hera Safitri, Amalia Fitri Hakim, Salsabila Hanifa Rusyda

First published: 21 December 2021 | <https://doi.org/10.1002/hsr2.444> | Citations: 1

Funding information No funding.

SECTIONS

PDF TOOLS SHARE

1 INTRODUCTION

Many patients experience post-COVID-19 sequelae that lead to impaired quality of life after recovering from COVID-19.¹ To date, there have been 1 657 035 cases of COVID-19, with 45 116 dead and 1 511 417 recovered in Indonesia.² We assessed sequelae in COVID-19 patients and most common sequelae, both those who had self-isolated and those who were hospitalized, who had recovered for more than 3 months after negative polymerase chain reaction (PCR) swab results. COVID-19 sequelae are persistent symptomatology, and outcomes after hospital discharge or completion of self-isolation with a wide and multifaceted range of clinical manifestations were identified, including respiratory, gastrointestinal, neurological, cardiovascular symptoms, and other organ manifestations.¹

2 METHODS

This study by the Faculty of Medicine, Sultan Ageng Tirtayasa University assessed the sequelae of adult patients who confirmed positive for COVID-19 infection based on PCR examination, who had undergone self-isolation or hospitalization and had been declared recovered for more than 3 months. These sequelae are persistent symptoms that develop during or following a confirmed case of COVID-19 and that continue for >28 days. The patients were retrospectively included in this study. Informed consent was signed by the patients, and this study was approved by the ethics committee of Bhayangkara Brimob Hospital. This study follows the Strengthening of Reporting of Observational Studies in



Volume 4, Issue 4
December 2021
e444

Recommended

Observations of the initial stage of a rocket-and-wire-triggered lightning discharge

Yang Zhang, Paul R. Krehbiel, Yijun Zhang, Weitao Lu, Dong Zheng, Liangtao Xu, Zhigang Huang

Geophysical Research Letters

Termination of Electron Acceleration in Thundercloud by Intracloud/Intercloud Discharge

Y. Wada, G. S. Bowers, T. Enoto, M. Kamogawa, Y. Nakamura, T. Morimoto, D. M. Smith, Y. Furuta, K. Nakazawa, T. Yuasa, A. Matsuki, M. Kubo, T. Tamagawa, K. Makishima, H. Tsuchiya

Geophysical Research Letters

First 10 Months of TGF Observations by ASIM

N. Østgaard, T. Neubert, V. Reglero, K. Ullaland, S. Yang, G. Genov, M. Marisaldi, A. Mezentsev, P. Kochkin, N. Lehtinen, D. Sarria, B. H. Qureshi, A. Solberg, C. Maiorana, K. Albrechtsen, C. Budtz-Jørgensen, I. Kuvvetli, F. Christiansen, O. Chanrion, M. Heumesser,

Link :

<https://onlinelibrary.wiley.com/doi/full/10.1002/hsr2.444>