

ASERS

# Journal of Environmental Management and Tourism

Quarterly

Volume XI

Issue 7(47)

Winter 2020

ISSN 2068 – 7729

Journal DOI

<https://doi.org/10.14505/jemt>

 **ASERS**  
Publishing



Editor in Chief

**Ramona PÎRVU**

University of Craiova, Romania

Editorial Advisory Board

**Omran Abdelnaser**

University Sains Malaysia, Malaysia

**Huong Ha**

University of Newcastle, Singapore,  
Australia

**Harjeet Kaur**

HELP University College, Malaysia

**Janusz Grabara**

Czestochowa University of Technology,  
Poland

**Vicky Katsoni**

Technological Educational Institute of  
Athens, Greece

**Sebastian Kot**

Czestochowa University of Technology,  
The Institute of Logistics and International  
Management, Poland

**Nodar Lekishvili**

Tbilisi State University, Georgia

**Andreea Marin-Pantelescu**

Academy of Economic Studies Bucharest,  
Romania

**Piotr Misztal**

The Jan Kochanowski University in  
Kielce, Faculty of Management and  
Administration, Poland

**Agnieszka Mrozik**

Faculty of Biology and Environmental  
protection, University of Silesia, Katowice,  
Poland

**Chuen-Chee Pek**

Nottingham University Business School,  
Malaysia

**Roberta De Santis**

LUISS University, Italy

**Fabio Gaetano Santeramo**

University of Foggia, Italy

**Dan Seligsteanu**

University of Craiova, Romania

**Laura Ungureanu**

Spiru Haret University, Romania

ASERS Publishing

<http://www.asers.eu/asers-publishing>

ISSN 2068 – 7729

Journal DOI: <https://doi.org/10.14505/jemt>

Table of Contents:

1	<b>Strict Liability Principle Application in the Management of Straits Marine Pollution for International Navigation according to the Indonesia Sea Convention Law</b> Luh Putu SUDINI, Anak Agung Gede RAKA, Tutut HERAWAN	1601
2	<b>Assessment of Waste Management System among Hotels and Guest Houses in Minna</b> Ebenezer A. OLUWOLE, Hamza ATTAHIRU, Olorunfemi B. OYEDIRAN, Stephen K. OMOTUGBA, Patience N. MEDUNA, Gbemiga T. KOLAWOLE	1609
3	<b>Financial Mechanism for Managing the Environmental Innovation Development of the Economy in Ukraine</b> Victoria BORISOVA, Iryna SAMOSHKINA, Larysa RYBINA, Olena SHUMKOVA	1617
4	<b>The Empirical Research of The Potential, Awareness and Current State of Agricultural Waste Use to Ensure Energy Autonomy of Agricultural Enterprises of Ukraine</b> Vitaliy LUTSIK, Natalia PRYSHLIAK, Dina TOKARCHUK, Irina SEMCHUK	1634
5	<b>Environmental Innovations as a Factor of Increasing the Economic Efficiency of Production. Study Case: Pavlodar Region</b> Zylfiya A. ARYNOVA, Lyazzatkenovna KAIDAROVA, Rysty B. SARTOVA, Gulmira D. BAYANDINA, Shynar Z. RAKHMETULLINA, Mariyam T. ZHETESSOV	1649
6	<b>A Model of the Causal Relationships between the Factors Influencing the Performance of Green Organizations Managing Energy-Saving Buildings in Bangkok and Vicinity</b> Witaya PATARAMETAGUL, Ananya POPRADIT, Nisa PAKVILAI, Ampon SHOOSANUK	1656
7	<b>Innovative Approaches to the Management of Commercial and Economic Activities of Environmental Enterprise - "Spicy Pack"</b> Valentyna ARANCHIY, Ilona YASNOLOB, Nataliia DEMIANENKO, Oleksandr BEZKROVNYI, Olena MYKHAILOVA, Svitlana PYSARENKO, Liudmyla CHIP, Oleksandr ARESTOV, Liudmyla HORBATIUK	1664
8	<b>Analysis and Assessment of Seismic Hazard for the Azov-Black Sea Recreation Area</b> Marina ZARETSKAYA	1672
9	<b>Nipa Forest as the Ecological Services in Eastern Coast of Thailand</b> Tantus PIEKKOONTOD, Pumiphat PACHANA, Karnjana HRIMPENG, Kitsanai CHAROENJIT	1683
10	<b>Technical Equipment of Agriculture and the Problems of the Agricultural Sector Rehabilitation in the Context of Kazakhstan and Mongolia</b> S.M. TOKENOVA, A.B. KULEKESHOVA, M.H. KADRINOV, S.K. TAZHIKENOVA	1692
11	<b>Public - Private Partnerships in Ecotourism Development in Protected Areas: A Case Study of Tunkinsky National Park in Russia</b> Lyudmila MAKSAANOVA, Sembrika IVANOVA, Darima BUDAEVA, Alyona ANDREEVA	1700
12	<b>The Green Technology Practices and Investments of Sipalay City Beach - Resorts</b> Marjon C. MALACAPAY, Reynaldo TABABA	1708
13	<b>Sustainable Tourism Business Promotion in Pakistan: A Descriptive Analysis of Logistics and Environmental Agreements</b> Nazir ULLAH, Saidatul Nadia Abd AZIZ, Rao Qasim IDREES	1719

**Editor in Chief**

**Ramona PÎRVU**

University of Craiova, Romania

**Editorial Advisory Board**

**Omran Abdelnaser**

University Sains Malaysia, Malaysia

**Huong Ha**

University of Newcastle, Singapore,  
Australia

**Harjeet Kaur**

HELP University College, Malaysia

**Janusz Grabara**

Czestochowa University of Technology,  
Poland

**Vicky Katsoni**

Techonological Educational Institute of  
Athens, Greece

**Sebastian Kot**

Czestochowa University of Technology,  
The Institute of Logistics and International  
Management, Poland

**Nodar Lekishvili**

Tbilisi State University, Georgia

**Andreea Marin-Pantelescu**

Academy of Economic Studies Bucharest,  
Romania

**Piotr Misztal**

The Jan Kochanowski University in  
Kielce, Faculty of Management and  
Administration, Poland

**Agnieszka Mrozik**

Faculty of Biology and Environmental  
protection, University of Silesia, Katowice,  
Poland

**Chuen-Chee Pek**

Nottingham University Business School,  
Malaysia

**Roberta De Santis**

LUISS University, Italy

**Fabio Gaetano Santeramo**

University of Foggia, Italy

**Dan Selişteanu**

University of Craiova, Romania

**Laura Ungureanu**

Spiru Haret University, Romania

ASERS Publishing

<http://www.asers.eu/asers-publishing>

ISSN 2068 – 7729

Journal DOI: <https://doi.org/10.14505/jemt>

14	<b>The Disaster as a Factor in the Development of Modern Tourism. A Study Case Based on the Chernobyl Nuclear Power Plant</b> Daniel BAKOTA, Robert MACHOWSKI, Arkadiusz PŁOMIŃSKI, Aliaksei RAMANCHUK, Mariusz RZĘTAŁA, Lesia ZASTAVETSKA	1729
15	<b>Comparative Evaluation of the Efficiency of Regulatory Mechanisms of the Oil and Gas Industry and Industrial Waste Processing</b> Dinara Y. SATENOVA, Zhanat M. BULAKBAY, Saule AZYLKANOVA, Rysty K. BERSTEMBAEVA, Zhibek ABYLKASSIMOVA, Jamilya SEITKHOZHINA	1742
16	<b>Greenhouse Gas Emissions from Household Waste in Denpasar City</b> Made ARMADI, Wayan SUARNA, Made SUDARMA, Made Sudiana MAHENDRA, Nyoman SUDIPA	1750
17	<b>Environmental Components and Mechanism of Public - Private Partnership in the Area of Risk Insurance in Crop</b> Zamzagul BAIMAGAMBETOVA, Rymkul ISMAILOVA, Aisulu KULMAGANBETOVA, Meiramkul KASSIMBEKOVA, Zhibek OMARKHANOVA	1761
18	<b>An Investigation into Medical Waste Management Practices in Hospitals in Northern Peninsula Malaysia</b> Abdelnaser OMRAN, Mohammed Khalifa Abdelsalam MOHAMMED	1779
19	<b>Legal Regulation of Agricultural Cooperation. New Approaches and Prospects for Developing Rural Areas</b> Kalymbek BAKYTZHAN, Lazzat YERKINBAYEVA, Daniya NURMUKHANKYZY, Madina ZHUSUPBEKOVA, Indira NESIPBAYEVA	1799
20	<b>Reasons and Benefits of Seasonal Migrations in the Villages of Rugova</b> Addhe KRASNIQI, Hazer DANA, Tomor ÇELA	1806
21	<b>Influence of Financial and Climate Factors on Agricultural Industry Development</b> Zhanar LUKPANOVA, Zhanar TOYZHIGITOVA, Gulzhan ALINA, Almagul JUMABEKOVA, Arailym ORAZGALIYEVA	1813
22	<b>Main Directions of Increasing Competitiveness Considering Specificity of Agriculture and Its Sustainable Development</b> Yerzhan ZHUSSUPOV, Madina TURSUMBAYEVA, Roza SHOKHAN, Baglan AIMURZINA, Mazken KAMENOVA, Ainura OMAROVA	1829
23	<b>Investment, Organizational and Environmental Aspects of Regulation of Small and Medium Business</b> Arseniy KRIKUNOV, Ainur UTEUBAYEVA, Berik NAZH MIDENOV, Ansar KABIEV, Kulyash SYZDYKOVA, Gulnara BAIBASHEVA	1841
24	<b>Public Perception of the Main Constraints of Water Supply Shortage and the Availability of Water Supply Resources in Libya</b> Jouda R. Jouda HAMAD, Wan Zuhairi W. YAAKOB, Abdelnaser OMRAN	1857
25	<b>Rehabilitation Tourism Opportunities in the Russian Federation for Recovering COVID-19 Patients</b> Mikhail A. OSADCHUK, Maxim V. TRUSHIN, Alexey M. OSADCHUK, Ekaterina D. MIRONOVA, Karina S. SOLODENKOVA, Alisa E. LAZAREVA	1871
26	<b>An Experience of Tourism Development: How is the Strategy?</b> Sri Langgeng RATNASARI, Ervin Nora SUSANTI, Widodo ISMANTO, Rona TANJUNG, Dio Caisar DARMA, Gandhi SUTJAHJO	1877

# Call for Papers Spring Issues 2021 Journal of Environmental Management and Tourism

**Journal of Environmental Management and Tourism** is an interdisciplinary research journal, aimed to publish articles and original research papers that should contribute to the development of both experimental and theoretical nature in the field of Environmental Management and Tourism Sciences.

Journal will publish original research and seeks to cover a wide range of topics regarding environmental management and engineering, environmental management and health, environmental chemistry, environmental protection technologies (water, air, soil), pollution reduction at source and waste minimization, energy and environment, modeling, simulation and optimization for environmental protection; environmental biotechnology, environmental education and sustainable development, environmental strategies and policies, etc. This topic may include the fields indicated above, but are not limited to these.

Authors are encouraged to submit high quality, original works that discuss the latest developments in environmental management research and application with the certain scope to share experiences and research findings and to stimulate more ideas and useful insights regarding current best-practices and future directions in environmental management.

*Journal of Environmental Management and Tourism* is indexed in SCOPUS, RePEC, CEEOL, ProQuest, EBSCO and Cabell Directory databases.

All the papers will be first considered by the Editors for general relevance, originality and significance. If accepted for review, papers will then be subject to double blind peer review.

<b>Deadline for submission:</b>	20 <sup>th</sup> February 2021
<b>Expected publication date:</b>	March 2021
<b>Website:</b>	<a href="https://journals.aserspublishing.eu/jemt">https://journals.aserspublishing.eu/jemt</a>
<b>E-mail:</b>	<a href="mailto:jemt@aserspublishing.eu">jemt@aserspublishing.eu</a>

To prepare your paper for submission, please see full author guidelines in the following file: [JEMT\\_Full\\_Paper\\_Template.docx](#), then send it via email at [jemt@aserspublishing.eu](mailto:jemt@aserspublishing.eu).



DOI: [https://doi.org/10.14505/jemt.v11.7\(47\).25](https://doi.org/10.14505/jemt.v11.7(47).25)

## Rehabilitation Tourism Opportunities in the Russian Federation for Recovering COVID-19 Patients

Mikhail A. OSADCHUK

Federal State Autonomous Educational Institution of Higher Education I.M. Sechenov First Moscow State Medical University of the Ministry of Health of the Russian Federation - Sechenov University, Russia  
[osadchuk.mikhail@yandex.ru](mailto:osadchuk.mikhail@yandex.ru)

Maxim V. TRUSHIN

Kazan Federal University, Russia  
[maxim.trushin@kpfu.ru](mailto:maxim.trushin@kpfu.ru)

Alexey M. OSADCHUK

Samara State Medical University under the Ministry of Health of the Russian Federation, Russia  
[maxlife2004@mail.ru](mailto:maxlife2004@mail.ru)

Ekaterina D. MIRONOVA

Federal State Autonomous Educational Institution of Higher Education I.M. Sechenov First Moscow State Medical University of the Ministry of Health of the Russian Federation - Sechenov University, Russia  
[yek.mironiova1995@yandex.ru](mailto:yek.mironiova1995@yandex.ru)

Karina S. SOLODENKOVA

Federal State Autonomous Educational Institution of Higher Education I.M. Sechenov First Moscow State Medical University of the Ministry of Health of the Russian Federation - Sechenov University, Russia  
[ksolodenkova@mail.ru](mailto:ksolodenkova@mail.ru)

Alisa E. LAZAREVA

Federal State Autonomous Educational Institution of Higher Education I.M. Sechenov First Moscow State Medical University of the Ministry of Health of the Russian Federation - Sechenov University, Russia  
[lazareva27lisa@rambler.ru](mailto:lazareva27lisa@rambler.ru)

### Suggested Citation:

Osadchuk, M. A., et al. (2020). Rehabilitation Tourism Opportunities in the Russian Federation for Recovering COVID-19 Patients. *Journal of Environmental Management and Tourism*, (Volume XI, Winter), 7(47): 1871 - 1876. DOI:[10.14505/jemt.v11.7\(47\).25](https://doi.org/10.14505/jemt.v11.7(47).25)

### Article's History:

Received 13<sup>th</sup> of September 2020; Received in revised form 15<sup>th</sup> of October 2020; Accepted 17<sup>th</sup> of November 2020; Published 30<sup>th</sup> of November 2020. Copyright © 2020 by ASERS® Publishing. All rights reserved.

### Abstract:

The COVID-19 pandemic determined the necessity for prompt diagnostics and optimal routing of patients, followed by rehabilitation and secondary prevention, as domestic tourism intensifies. The epidemic increased the importance of digital systems for the tourism service market. Digitalization took leading positions in the tourism industry and made market participants adapt to these changes for optimizing their activities and increasing revenues. Further development of tourism in Russia, giving the ongoing pandemic, would require digital technologies such as multilanguage informational services overcoming language barriers, digital tourist cards, mobile apps introducing cultural and national landmarks online, web services for preparing tourist routes. Judging from scientific and practical experience, we can expect that medical, social, physical and psychological rehabilitation supervised by medical personnel will improve body functioning including heart, lungs, central nervous system as well as restore patients' quality of life in general.

**Keywords:** COVID-19 pandemic; medical, social, physical and psychological rehabilitation; domestic tourism; digital technologies.

**JEL Classification:** I11; Z32.



## **1. COVID-19 Infection in the Modern World and in Russia. Rehabilitation of Former COVID Patients as a Healthcare Issue**

The outbreak of a new coronavirus infection started in China, in December 2019. In February 2020, the World Health Organization (WHO) named the infection COVID-19 (Coronavirus disease 2019) and declared it a global emergency issue, while the International Committee on Taxonomy of Viruses classified the new disease as SARS-CoV-2 (Ministry of Health of Russia 2020; World Health Organization 2020a). The pandemic affected over 200 countries and caused significant economic losses, spiking infection and mortality rates. As of July 28, 2020, according to statistical data, 16 465 707 cases of COVID-19 were registered all over the world (European Centre for Disease Prevention and Control 2020).

The overwhelming global-scale spread of COVID-19 determined the necessity for prompt diagnostics and optimal routing of patients, followed by rehabilitation and secondary prevention. These activities require rehabilitation community to be aware of infection severity and early-stage measures that must be taken during the apparently long-term pandemic.

Lack of immunity to the infection among the majority of the world population, as well as high infection and death rates, demand implementing social distancing and infection control for all stages of rehabilitation stages (Choon-Huat Koh and Hoenig 2020). Given the scope of the new virus and its acute symptoms, social and medical priority should be given to rehabilitation of patients who had severe cases of COVID-19, in particular adults suffering from post-intensive care syndrome (PICS) and acute respiratory distress syndrome (ARDS) (Ivanova *et al.* 2020).

The spread and severity of COVID-19, its difference from other respiratory diseases, led to a so-called “non-infectious pandemic” (“a pandemic of fear”), initiated and promulgated by information technologies (Ornell *et al.* 2020).

## **2. Global and Russian Medical Tourism in Times of the COVID Pandemic**

As the world faced a global pandemic (Huang *et al.* 2020), tourism and hotel industries took a serious damage. Numerous bans on international travel affecting over 90% of the world’s population, as well as strict social distancing measures, destroyed tourism industry in March 2020 (Grech, Grech and Fabri 2020).

Closing borders became a heavy burden for Russian tourism industry as well. Only in the hotel business, several months of suspended activities cost more than 200 billion rubles (Vlasova 2020). Nowadays, due to COVID-19 limitations, Russian tourism industry turnover plummeted by 95-100%, while the revenue loss volume already exceeded 1.5 trillion rubles (Vlasova 2020).

Since June 2020, the industry began to slowly recover, as cafes, restaurants and open-air summer theaters went back to work. Lots of people were traveling to the Crimea, Northern Caucasus, the Baltic Sea and Altai resorts. Hotels started to accommodate visitors, beaches were open for tourists and air traffic between Russian resort cities intensified. Despite heavy financial losses, the pandemic actually promoted domestic tourism. The government of the Russian Federation provided an additional incentive for the industry by extending the tax and insurance payment period for tourist agencies and air companies affected by COVID-19 (Daily Electronic Newspaper of the Russian Union of Travel Industry 2020). Besides, until the end of 2020, tourist agencies were freed from making payments to the tourist association fund and personal responsibility funds (Daily Electronic Newspaper of the Russian Union of Travel Industry 2020).

Slowing COVID-19 spread resulted primarily in a domestic tourism increase. It is the cost-saving national tourism that becomes in greater demand due to the ongoing financial crisis and lowered ability to pay. However, restoring international tourism will apparently require much more time and effort. This is the reason why many countries tend to prioritize domestic tourism and its most popular resorts while simultaneously developing new potential destinations.

## **3. Medical Tourism and Rehabilitation Programs for Former COVID-19 Patients in Russia**

COVID-19 pandemic increased the importance of digital systems for the tourism service market. Digitalization took leading positions in the tourism industry and companies started adapting to these changes in order to optimize their activities and increase their profits. This is why much attention nowadays is paid to development and endorsement of digital products for both traditional and new tourist destinations.

The 2035 program of Russian tourism development includes establishment of the federal market competence center that would promote a common digital platform for the national tourism system (Machalkin and Moreva 2018). This project involves development of digital technologies such as multilanguage informational

services overcoming language barriers, digital tourist cards, mobile apps introducing cultural and national landmarks online, web services for preparing tourist routes (Krasnokutskiy *et al.* 2016).

In the Russian Federation, medical rehabilitation consists of three stages. Stage 1 provides therapeutical hospital treatment, Stage 2 - treatment in a 24/7 rehabilitation facility. Stage 3 comprises daytime hospital activities or rehabilitation in an outpatient institution (Ivanova *et al.* 2020). Typical examination of post-hospitalization patients involves standard clinical and laboratory procedures, based on which the medical team prepares a rehabilitation program (see Table 1) (World Health Organization 2020b).

Patients recovering from COVID-19 need regaining their basic functions, *e.g.* restoring lung capacity, oxygen saturation of blood, muscle strength, tolerance to physical stress and hypoxia, normal diet (protein and vitamins), stabilizing sleep and emotional well-being, as well as ensuring proper sputum clearance (Stam, Stucki, and Bickenbach 2020).

Table 1. Examining COVID-19 patients for post-hospitalization rehabilitation (World Health Organization 2020b)

Stages	Procedures
	17. Standard clinical and laboratory examination (general check-up, arterial pressure examination, clinical and biochemical blood tests including CRP test, LFT, general urine test)
	18. Additional procedures: resting and stress ECG (in case of stable condition only), pulse oximetry (saturation control), obligatory consultations by a cardiologist and a physical training therapist; if necessary – chest CT, consultations by other specialists
	19. Estimating stress levels of the rehabilitation program by a team consisting of a cardiologist, a physical training therapist, a pediatrician
<b>Note:</b> Patients recovering from COVID-19 may suffer rapid decompensation even in case of minor stress. All stress tests must be attended by intensive care personnel.	

Until recently, the focus was on intensive care treatment of patients in serious condition. Much less attention was given to ensuring healthcare management for large groups of people recovering from acute coronavirus infection, *i.e.* the patients who got discharged from the hospital and either undergo long-term rehabilitation in sanatoriums and outpatient clinics or return home for individual recuperation. Gradual return to normal lifestyle must be based on well-planned screening programs developed by a primary healthcare doctor or a team of physiotherapists, phycologists, intensive care doctors and other specialists. Screening methods must involve electronic healthcare tools available to the doctor and the patient (Doremalen *et al.* 2020).

In terms of COVID-19 infection, medical rehabilitation for patients with organic pathologies of musculoskeletal, cardiovascular or nervous systems should be approved by a medical commission according to multidisciplinary evaluation results. Rehabilitation of former coronavirus patients suffering from internal organs damage at Stages 2 and 3 must adhere to all infection control rules including usage of personal protection equipment by the patient and the medical personnel, as stated in federal clinical guidelines (Ivanova *et al.* 2020).

A 14-day isolation of COVID-19 patients upon completion of primary medical assistance provides an optimal time frame for telerehabilitation activities. Further rehabilitation involves transfer of patients to Stage 3 facilities according to regional road maps. It should be aimed mostly at preventing lung fibroses, thromboses or emboli and eliminating the risk of returning infection.

Taking into consideration high infection rate of COVID-19, duration of outpatient treatment in specialized and rehabilitation facilities, long-term virus carriage and clear reduction of patients' body functions that hinders their activity and involvement, it is recommended to switch from rehabilitation activities in daily outpatient and inpatient facilities to procedures performed at home (*i.e.* remotely) and involving telemedicine technologies. Meanwhile, the number of procedures requiring visits to medical facilities should be strictly limited. It is important for the personnel providing rehabilitation assistance requires direct close contact with patients (speech therapists, physicians etc.) that to wear high-level personal protection equipment.

When working with patients who had COVID-10, it should be noted that under normal conditions and air humidity the virus can remain on surface for 9 days. However, it can be effectively disactivated in 1 minute by treating the surface with 62-71% alcohol solution, 0.5% hydrogen peroxide solution or 0.1% sodium hypochlorite (Kampf *et al.* 2020). Regular infection control demonstrated continuous bacterial contamination of rehabilitation equipment such as electrode sponges, hot compress water, local application lotions and cavities for therapeutic balls. This means that the equipment requires constant control (Aljadi *et al.* 2017; Lambert *et al.* 2000; Mobin *et al.* 2011; Oesterle *et al.* 2019; Spratt *et al.* 2019) and the personnel must undergo training on wearing and removal of protection equipment as well as on continuous use of protection masks.

For rehabilitating patients who need to be quarantined (e.g. because of contacting a COVID-positive patient, minor or asymptomatic case of 2019-nCoV), deconditioning and rehabilitation activities become a serious problem due to requirements for medical personnel safety. The possible solution involves performing exercises at home or attending rehabilitation centers (if the patient is feeling well) with strict infection control involving checking patient for fever and flu symptoms at the entrance.

Research on telerehabilitation procedures for patients who had a stroke demonstrated a positive effect on motor skills, cortex functions and emotional well-being that is equal to or better than traditional methods of personal therapy (Del Rio and Malani 2020). However, there is still a lack of studies assessing efficiency of telerehabilitation for pathologies not related to strokes. For instance, diabetes mellitus (DM), chronic respiratory diseases and any type of cancer also pose a higher risk of death for patients with 2019-nCoV.

Diabetes mellitus (DM), rightfully considered an immune deficiency disease, is a significant comorbidity factor that affects severity and death rate of 2019-nCoV cases. Besides, DM can also lead to cardiovascular disorders and strokes and increases their severity, often resulting in death of a patient or in necessity for long-term rehabilitation.

Physical exercises have become an important element of post-COVID rehabilitation (World Health Organization 2020b). The work of a multidisciplinary rehabilitation team (MRT) is the key aspect of managing complex rehabilitation for patients who had COVID-19. MRT rehabilitation technologies include various methods of physical training therapy, mechanotherapy, physical rehabilitation, osteopathic correction and reflex therapy. MRT specialists develop individual rehabilitation programs, set out tasks and objectives of rehabilitation and carry out research activities.

Thus, Stage 3 of medical rehabilitation can be recommended to COVID-19 patients who need rehabilitation and have the ability to safely do it remotely; who save an informed consent for hospital and/or remote treatment and have the opportunities to participate in procedures remotely via telemedicine tools (Khan and Amatyia 2020).

Rehabilitation efficiency must be assessed basing on such indicators as oxygen saturation of capillary blood (pulse oximetry values must be 97-99%), ability to withstand hypoxia (Henchi-Stange test of holding breath when exhaling and inhaling: for a normal person not involved in regular physical activities, the value usually exceeds 30 seconds), simplified sound test - pronouncing digits during a long calm exhale (normal value – 30 or more digits), rib cage mobility (the normal difference between rib cage volumes along the mammillary line during an inhale and an exhale should be at least 4 cm). In case test results differ from normal values, the following is recommended:

- breathing gymnastics monitored by rehabilitation specialists involving remotely controlled telemedicine programs for at least 4 days – after this period, the patients perform the exercises themselves;
- daily aerobic low-intensity physical exercises (walking, cycling trainers) of at least 30 minutes 3 times a week for 8-12 weeks;
- mineral water inhalations (with low-alkaline mineral water) using an ultrasonic or compressor inhaler (Ministry of Health of Russia 2020).

It is worth taking into consideration the results of the first randomized controlled study assessing respiratory rehabilitation of patients who had COVID-19. The results demonstrated improved breathing functions, stabilized quality of life and lower anxiety levels among aged patents who performed breathing exercises for respiratory rehabilitation. After 6 weeks of 10-minute exercise sessions aimed at eliminating cough, diaphragm training and stretching, performed at home twice a week, patients' condition has significantly improved (Liu *et al.* 2020).

Severe coronavirus infection requires a long-term recovery of damaged functions and compensation of lost body functions. According to researchers from Italy, China and the UK, rehabilitation activities must continue non-stop for 2-3 months after getting infected, depending on the patient's condition (Bhatia *et al.* 2020; Demeco *et al.* 2020; Kiekens *et al.* 2020). Judging by experience of post-pneumonia recovery, rehabilitation of patients with chronic obstructive pulmonary disease (COPD) involving regular control of clinical and laboratory indicators should last up to a year or even longer in case of developing disabilities.

Even though scientific and practical knowledge of COVID-19 is still incomplete, given the large number of infected people we can expect that medical social, physical and psychological rehabilitation supervised by medical personnel will improve body functioning including heart, lungs, central nervous system as well as restore patients' quality of life in general. Well-timed preparation and careful planning help to reduce any negative influence on health caused by this unprecedented situation.

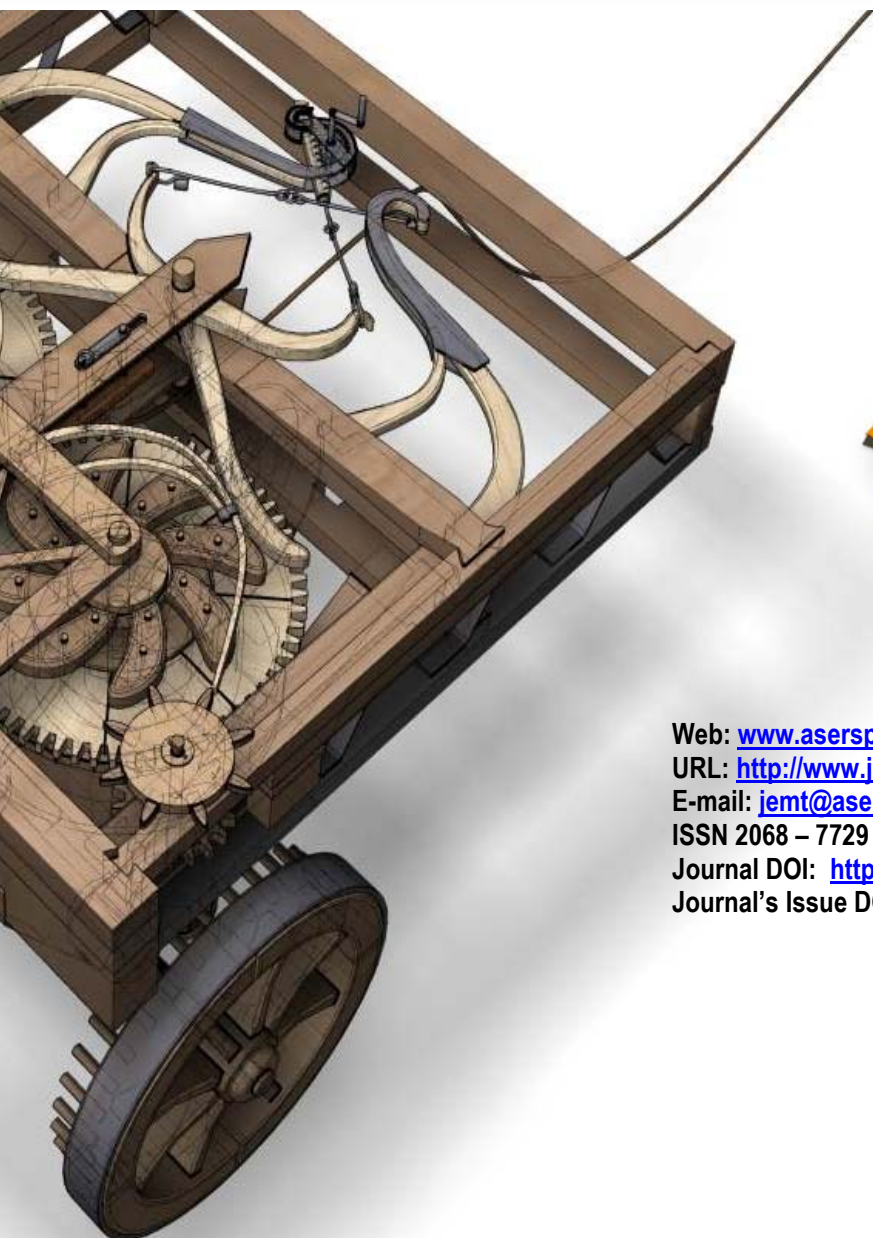


## References

- [1] Aljadi, S. H., *et al.* 2017. Bacterial Contamination in Physical Therapy Departments in the State of Kuwait. *Journal of Physical Therapy Science*, 29 (6): 1014–18. DOI: <https://doi.org/10.1589/jpts.29.1014>
- [2] Bhatia, R. T., *et al.* 2020. Exercise in the Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) Era: A Question and Answer Session with the Experts Endorsed by the Section of Sports Cardiology & Exercise of the European Association of Preventive Cardiology (EAPC). *European Journal of Preventive Cardiology*, 27 (12): 1242–51. DOI: <https://doi.org/10.1177/2047487320930596>
- [3] Choon-Huat Koh, G., and Hoenig, H. 2020. How Should the Rehabilitation Community Prepare for 2019-NCov? *Archives of Physical Medicine and Rehabilitation*, 101 (6): 1068–71. DOI: <https://doi.org/10.1016/j.apmr.2020.03.003>
- [4] Daily Electronic Newspaper of the Russian Union of Travel Industry. 2020. Rostourism Has Developed a Set of Measures to Save the Industry. Available at: [https://ratanews.ru/news/news\\_16042020\\_3.stm/](https://ratanews.ru/news/news_16042020_3.stm/)
- [5] Del Rio, C., and Malani, P. N. 2020. 2019 Novel Coronavirus-Important Information for Clinicians. *JAMA*, 323 (11): 1039–40. DOI: <https://doi.org/10.1001/jama.2020.1490>
- [6] Demeco, A., *et al.* 2020. Rehabilitation of Patients Post-COVID-19 Infection: A Literature Review. *The Journal of International Medical Research*, 48 (8): 300060520948382. DOI: <https://doi.org/10.1177/0300060520948382>
- [7] Doremalen, N., *et al.* 2020. Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1. *The New England Journal of Medicine*, 382 (16): 1564–67. DOI: <https://doi.org/10.1056/NEJMc2004973>
- [8] European Centre for Disease Prevention and Control. 2020. COVID-19 Situation Update Worldwide, as of 5 October 2020. Available at: <https://www.ecdc.europa.eu/en/geographical-distribution-2019-ncov-cases>
- [9] Grech, V., Grech, P. and Fabri, S. 2020. A risk balancing act – Tourism competition using health leverage in the COVID-19 era. *International Journal of Risk & Safety in Medicine*, 31 (3): 121–30. DOI: <https://doi.org/10.3233/JRS-200042>
- [10] Huang, C., *et al.* 2020. Clinical Features of Patients Infected with 2019 Novel Coronavirus in Wuhan, China. *Lancet*, 395 (10223): 497–506. DOI: [https://doi.org/10.1016/S0140-6736\(20\)30183-5](https://doi.org/10.1016/S0140-6736(20)30183-5)
- [11] Ivanova, G. E., *et al.* 2020. Medical rehabilitation at a new coronavirus infection (COVID-19). *Physical and rehabilitation medicine, medical rehabilitation*, 2 (2): 140–89. DOI: <https://doi.org/10.36425/rehab34231>
- [12] Ivanova, G. E., *et al.* 2020. Rehabilitation Care during the New COVID-19 Coronavirus Infection Epidemic at First, Second and Third Medical Rehabilitation Phases. *Physical and Rehabilitation Medicine, Medical Rehabilitation*, 2 (2): 98–117. DOI: <https://doi.org/10.36425/rehab34148>
- [13] Kampf, G., Todt, D. Pfaender, S. and Steinmann, E. 2020. Persistence of Coronaviruses on Inanimate Surfaces and Their Inactivation with Biocidal Agents. *The Journal of Hospital Infection*, 104 (3): 246–51. DOI: <https://doi.org/10.1016/j.jhin.2020.01.022>
- [14] Khan, F., and Amatya, B. 2020. Medical Rehabilitation in Pandemics: Towards a New Perspective. *Journal of Rehabilitation Medicine*, 52 (4): jrm00043. DOI: <https://doi.org/10.2340/16501977-2676>
- [15] Kiekens, C., *et al.* 2020. Rehabilitation and Respiratory Management in the Acute and Early Post-Acute Phase. 'Instant Paper from the Field' on Rehabilitation Answers to the COVID-19 Emergency. *European Journal of Physical and Rehabilitation Medicine*, 56 (3): 323–26. DOI: <https://doi.org/10.23736/S1973-9087.20.06305-4>
- [16] Krasnokutskiy, P., *et al.* 2016. The Main Trends and Prospects of Development of International Tourism. *International Journal of Economics and Financial Issues*, 6 (8): 257–62.
- [17] Lambert, I., *et al.* 2000. Interferential Therapy Machines as Possible Vehicles for Cross-Infection. *The Journal of Hospital Infection*, 44 (1): 59–64. DOI: <https://doi.org/10.1053/jhin.1999.0647>

- [18] Liu, K., *et al.* 2020. Respiratory Rehabilitation in Elderly Patients with COVID-19: A Randomized Controlled Study. *Complementary Therapies in Clinical Practice* 39 (May): 101166. DOI:<https://doi.org/10.1016/j.ctcp.2020.101166>
- [19] Machalkin, S. E., and Moreva, S. N. 2018. Analysis of the Dynamics of the Main Statistical Indicators of the *Tourism Industry in Russia*, 13 (104): 130–34. DOI: <https://doi.org/10.20310/1819-8813-2018-13-104-130-134>
- [20] Ministry of Health of Russia. 2020. Temporary Guidelines for the Prevention, Diagnosis and Treatment of New Coronavirus Infection (COVID-19). Version 6 (04.28.2020). Available at: [https://static-1.rosminzdrav.ru/system/attachments/attaches/000/050/122/original/28042020\\_MR\\_COVID-19\\_v6.pdf](https://static-1.rosminzdrav.ru/system/attachments/attaches/000/050/122/original/28042020_MR_COVID-19_v6.pdf)
- [21] Mobin, M., *et al.* 2011. The Presence of Fungi on Contact Electrical Stimulation Electrodes and Ultrasound Transducers in Physiotherapy Clinics. *Physiotherapy*, 97 (4): 273–77. DOI:<https://doi.org/10.1016/j.physio.2010.11.010>
- [22] Oesterle, M. E., *et al.* 2019. Are Ball Pits Located in Physical Therapy Clinical Settings a Source of Pathogenic Microorganisms? *American Journal of Infection Control*, 47 (4): 456–58. DOI:<https://doi.org/10.1016/j.ajic.2018.09.031>
- [23] Ornell, F., Schuch, J. B. Sordi, A. O., and Kessler, F. H. P. 2020. Pandemic Fear' and COVID-19: Mental Health Burden and Strategies. *Revista Brasileira De Psiquiatria (Sao Paulo, Brazil: 1999)*, 42 (3): 232–35. DOI: <https://doi.org/10.1590/1516-4446-2020-0008>
- [24] Spratt, H. G., *et al.* 2019. Topical Lotions Utilized in Outpatient Rehabilitation Clinics as a Potential Source of Bacterial Contamination. *Physiotherapy Theory and Practice*, 35 (2): 163–70. DOI:<https://doi.org/10.1080/09593985.2018.1441935>
- [25] Stam, H. J., Stucki, G. and Bickenbach, J. 2020. Covid-19 and Post Intensive Care Syndrome: A Call for Action. *Journal of Rehabilitation Medicine*, 52 (4): jrm00044. DOI: <https://doi.org/10.2340/16501977-2677>
- [26] Vlasova, I. 2020. An Unprecedented Crisis: How Many Hotels Will Lose. *Gazeta.Ru*. Available at: <https://m.gazeta.ru/business/2020/04/30/13068283.shtml>
- [27] World Health Organization. 2020a. Coronavirus Disease (COVID-19) Pandemic. Available at: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019>
- [28] World Health Organization. 2020b. Support for Rehabilitation Self-Management after COVID-19- Related Illness. Available at: <https://apps.who.int/iris/bitstream/handle/10665/333287/WHO-EURO-2020-855-40590-54571-eng.pdf>

# ASERS



 **ASERS**  
Publishing

Web: [www.aserspublishing.eu](http://www.aserspublishing.eu)

URL: <http://www.journals.aserspublishing.eu/jemt>

E-mail: [jemt@aserspublishing.eu](mailto:jemt@aserspublishing.eu)

ISSN 2068 – 7729

Journal DOI: <https://doi.org/10.14505/jemt>

Journal's Issue DOI: [https://doi.org/10.14505/jemt.v11.7\(47\).00](https://doi.org/10.14505/jemt.v11.7(47).00)