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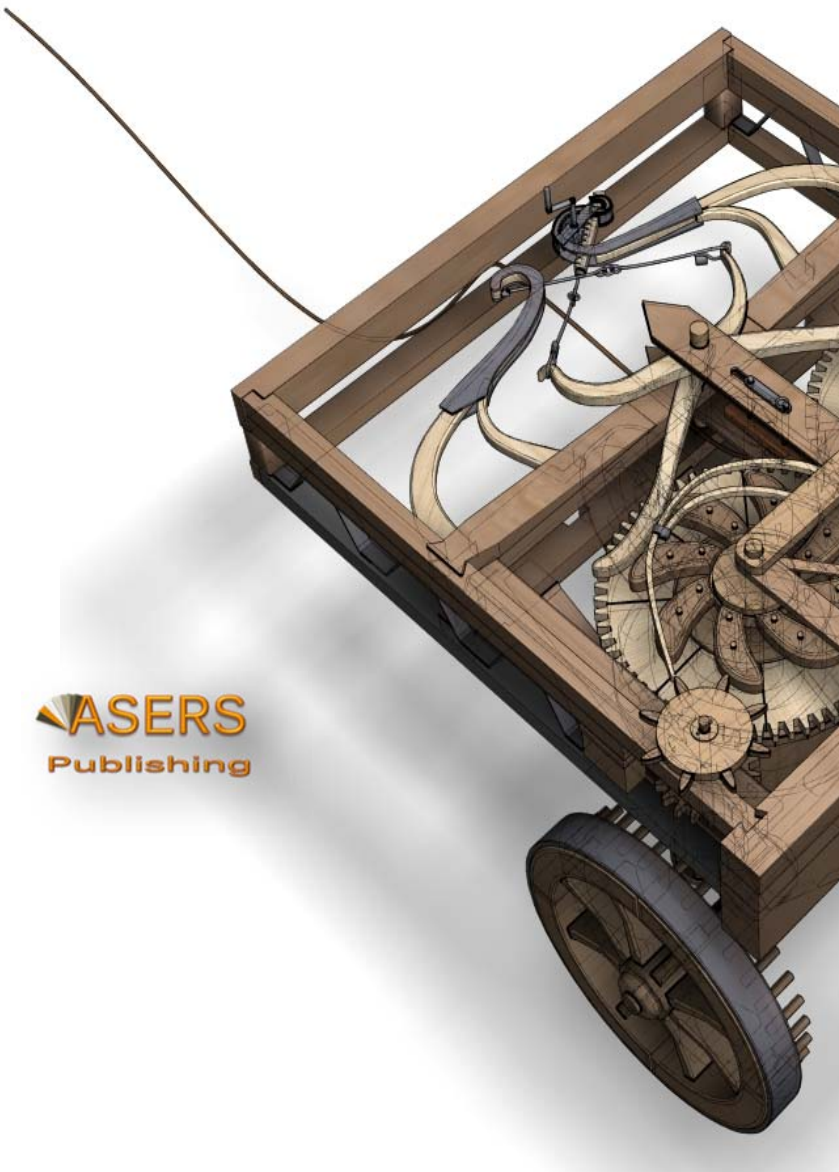

Quarterly
Volume XI
Issue 7(47)
Winter 2020
ISSN 2068 – 7729
Journal DOI
https://doi.org/10.14505/jemt

ASERS Publishing

Winter 2020
Volume XI
Issue 7(47)

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http://www.asers.eu/asers-publishing
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Fall 2020
Volume XI
Issue 6(46)

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Journal of Environmental Management and Tourism

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

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

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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

Article's History:

Received 13th of September 2020; Received in revised form 15th of October 2020; Accepted 17th of November 2020; Published 30th of November 2020.

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
Note: 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 Amatya 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.

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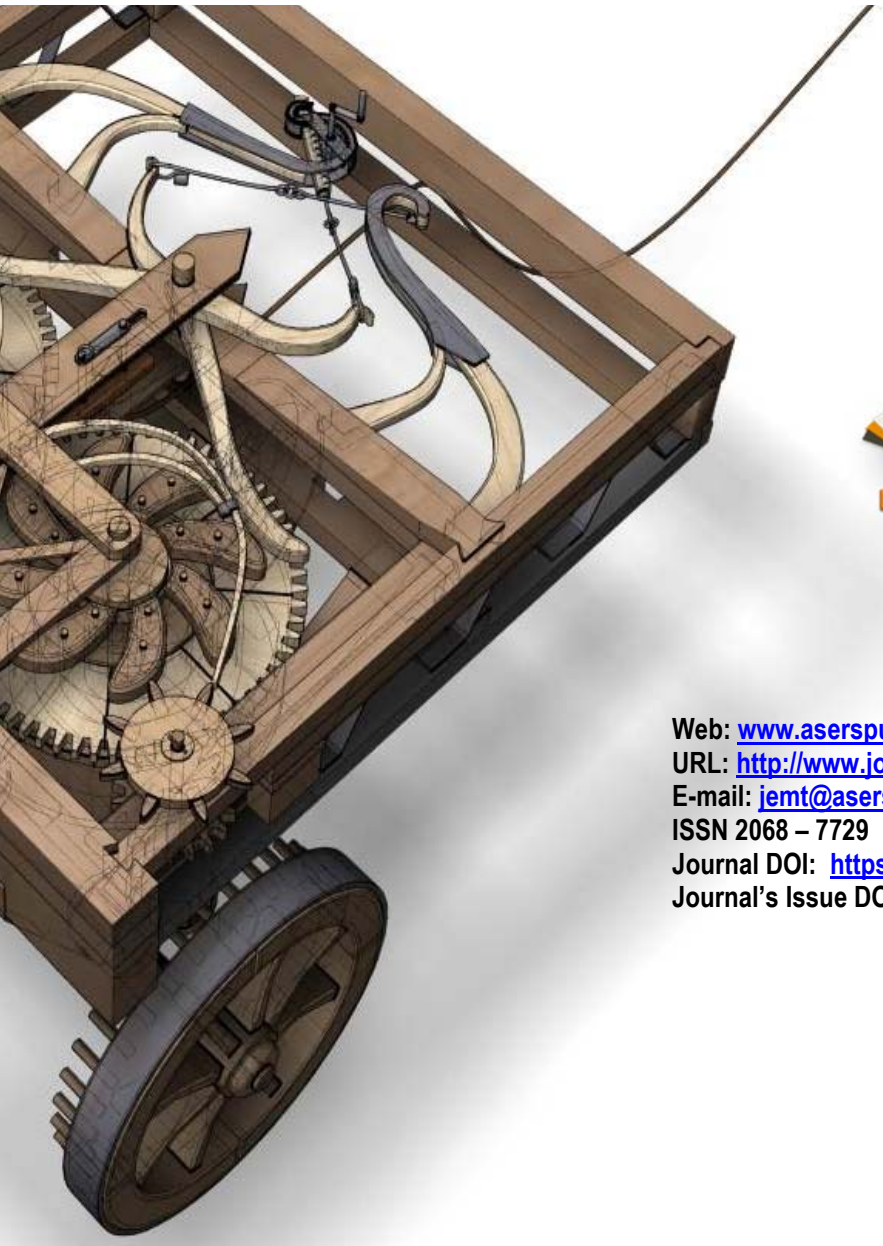

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Journal DOI: https://doi.org/10.14505/jemt
Journal's Issue DOI: https://doi.org/10.14505/jemt.v11.7(47).00