Possibilities of Applying Non-invasive Multichannel Electrical Stimulation Technology for Treatment Neuropsychiatric Disorders Associated with Post COVID-19 Condition

Timur Petrenko[a], Anna Petrenko[b] and Vladimir Kublanov[c]
Ural Federal University, Yekaterinburg, Russian Federation

Keywords: Pandemic COVID-19, Post COVID-19 Condition, Telemetry, Physiotherapy Services, Neuroelectrostimulator.

Abstract: The possibilities of using multichannel neuroelectrostimulation of nerve formations in the neck for the treatment of neuropsychiatric disorders arising from the Post Covid-19 condition are considered. Three clinical cases of the use of such technology, implemented in the device "SYMPATHOCOR-01", are presented. All patients were previously diagnosed with coronavirus infection of varying severity. The patients' condition was assessed clinically and based on psychometric scales: depression - HDRS and BDI-II, anxiety - SPRAS, asthenia - MFI-20. The duration of the disease was 4-6 months. The course of treatment was three weeks. All patients showed marked positive clinical dynamics. The proposed methods of hardware treatment of Post COVID-19 condition can be implemented in telemedicine projects for the provision of services in real time, which minimizes the contact between doctor and patient, and undoubtedly may be in demand in the future post-pandemic society.

1 INTRODUCTION

According to a WHO study, the COVID-19 pandemic has increased the need for neurological and mental health services: bereavement, isolation, loss of income and fear of the future disrupt mental health and exacerbate existing problems. High levels of social stress push people towards substance and alcohol abuse. Meanwhile, there is compelling evidence that the coronavirus has neurotoxic effects, leading to impaired perception, anxiety, asthenia, depression. People with pre-existing mental, drug and neurological disorders are more vulnerable to coronavirus infection - they are at high risk of severe outcomes and even death (WHO, 2020).

Under these conditions, there is a need for non-invasive medical neurorehabilitation technologies capable of restoring neuropsychiatric disorders resulting from depression, stroke, brain and spinal cord trauma, or progressive degenerative and hereditary diseases.

Despite the successes of modern medical science, the main method of treating neuropsychiatric disorders is still the use of pharmacological drugs (drugs, medicines). Not infrequently, this leads to undesirable reactions, side effects and complications. The treatment process in conditions of individual sensitivity and tolerance of pharmacological agents becomes difficult to control and poorly predictable. In this regard, frequent clinical monitoring of the patient's condition is required, requiring the doctor to make frequent face-to-face visits, to assess various physiological parameters, blood composition parameters, etc. At each meeting, the doctor has to solve the time-consuming task of adjusting the doses of drugs, balancing their effectiveness and safety. Physiotherapy services do not have many of the above problems.

The paper discusses some of the possibilities of using multichannel neuroelectrostimulation of the nerve formations of the neck for the treatment of anxiety, depressive and asthenic conditions arising from Post COVID-19 condition (U09.9). The

[a] https://orcid.org/0000-0001-7328-9894
[b] https://orcid.org/0000-0001-5906-5755
[c] https://orcid.org/0000-0001-6584-4544

Petrenko, T., Petrenko, A. and Kublanov, V.
Possibilities of Applying Non-invasive Multichannel Electrical Stimulation Technology for Treatment Neuropsychiatric Disorders Associated with Post COVID-19 Condition.
DOI: 10.5220/0011013800003123
In *Proceedings of the 15th International Joint Conference on Biomedical Engineering Systems and Technologies (BIOSTEC 2022) - Volume 1: BIODEVICES*, pages 332-337
ISBN: 978-989-758-552-4; ISSN: 2184-4305

organization of services in real time will minimize the contact between the doctor and the patient and, as a result, the risks of the spread of COVID-19, while maintaining the ability to effectively manage the treatment process. The presented solutions are quite in demand at the present time and undoubtedly may be in demand in the future post-pandemic society. (Palacín-Marín et al., 2013).

2 MATERIAL AND METHODS

The coronavirus is still poorly understood, but its neurotropic (the ability to infect nerve cells) has been proven - and it is higher than that of other viruses. It has been established that the virus penetrates into the nervous system through the blood-brain barrier, that is, from any organs - into the brain; through blood cells; transneurally (through peripheral nerves). Accordingly, neurological disorders can manifest in any part of the body (Bao et al., 2020).

Virtually all original published studies of COVID-19 cases indicate that, in addition to impaired respiratory function, a third of patients (30% -35%) show signs of nervous system damage (Li et al., 2020a). Nonspecific neurological complications in COVID-19 are varied: headache, myalgia, fatigue, weakness, nausea, vomiting, anorexia, confusion, dizziness, malaise, shortness of breath (Rahman et al., 2020). ACE2 receptors, which facilitate the penetration of the virus into the cell, are expressed in the neuronal centers of the medulla oblongata and midbrain (Whittaker et al., 2020).

Specific neurological damage occurs due to the direct damaging effect of the virus on the cells of the nervous system. Represented by acute cerebrovascular disorders, myelitis (spinal cord lesions); polyneuropathy (damage to the peripheral nervous system); imbalance is often detected; convulsions. With damage to the central nervous system, 30% –80% of patients with COVID-19 experience disturbances in taste, smell, vision (Niazkar et al., 2020).

More and more works appear describing the long-term consequences of the postponed coronavirus infection in the form of psychological and psychopathological disorders, which sometimes transform into independent mental disorders. According to various studies, patients with COVID-19 show psychopathological symptoms for several reasons: the presence of symptoms of coronavirus infection and their progression; collateral

the effects of ongoing drug treatment; fear for your life; fear of transmitting the virus to others; social isolation and loneliness; feeling insecure and insecure; physical discomfort; negative media pressure (Talevi et al., 2020).

Up to 96.2% of clinically stable patients with COVID-19 develop psychological problems and symptoms of stress disorders, which leads to a decrease in the quality of life and disrupts work stability. A significant level of stress is observed during the period of illness, especially in the older population (Lai et al., 2020). One of the possible mechanisms of psychological disorders during infection with COVID-19 is an increased activation of the hypothalamic-pituitary-adrenal axis. This leads to the production of a large amount of stress hormones that have a damaging effect on somatic and nerve cells (Kang et al., 2020).

In the period from 2 to 12 months, 50% of those who have undergone COVID-19 experience depression, 55% - anxiety, about 70% - psychosomatic symptoms; 67.92% of these same patients suffered from insomnia, approximately 25% had suicidal thoughts (Taquet et al., 2021).

Patients with pre-existing mental disorders receive significantly less attention than is required during a pandemic. In most cases, such patients already have chronic somatic diseases, weakened health, which makes them more susceptible to the possibility of infection with SARS-CoV-2. Psychiatric patients with COVID-19 have a less pronounced effect of treatment and a high emotional response to illness (Umapathi et al., 2021).

The approaches to the treatment of neurological, mental and psychological disorders in patients who have recovered from COVID-19 remain nonspecific. Mainly used are neurometabolic drugs, vascular drugs, antidepressants, and in rare cases, antipsychotic drugs. It is known that all of these drugs do not have high therapeutic efficacy against neuropsychiatric disorders (Li et al., 2020b).

Scientists are constantly looking for alternative methods of treatment for depressive and anxiety disorders, chronic fatigue syndrome (resulting from various diseases), insomnia, chronic headache, a number of cerebrovascular diseases, vegetative-vascular and vegetative-vestibular disorders.

Earlier, we proposed an alternative, non-drug method of treating neuropsychic disorders, based on the correction of the activity of the autonomic nervous system. In the development of this method, it is possible to influence a spatially distributed field of current pulses in the projection of the cervical ganglia of the sympathetic nervous system, the vagus nerve, branches of the glossopharyngeal and hypoglossal

nerves, and the carotid nerve plexus (Kublanov et al., 2018).

The principles of organizing technical means for stimulating the cervical ganglia of the sympathetic division of the autonomic nervous system were proposed in the early 90s of the last centuries and implemented in the device "Corrector of the activity of the sympathetic nervous system SYMPATHOCOR-01". This device is structurally made in the form of a Monoblock, consisting of two multi-element electrodes (ME) and an electronic unit. 13 electrodes are placed on the cuff of each ME. The appearance of the device and the layout of its electrodes on the patient's neck during the treatment. Between two MEs, a spatially distributed field of monopolar positive current pulses is formed, the vector of which is projected into the target area. The developed method of medical application of the device was named dynamic correction of the activity of the autonomic nervous system (DCASNS) (Kublanov et al., 2008).

The modern version of the "SYMPATHOCOR-01" device is divided into two blocks, one of which forms the physical fields, the second is engaged in the control of the biotropic parameters of the field. The exchange of information between them is provided via wireless communication (Kublanov et al., 2021). The radius of action between the blocks of the neuroelectric stimulator is up to 10 m. The doctor and the patient are within the social (physical) distance, which is a measure to prevent the spread of the coronavirus COVID-19 (Thu et al., 2020).

The second block is implemented as an original cross-platform application for mobile devices based on Android and iOS. At the same time, a virtual control panel for the treatment process is formed, which allows real-time monitoring of the battery charge level, the health of the telemetric communication channel, the structure of the field of current pulses, their biotropic parameters and the position of stimulation targets (Kublanov et al., 2018).

The organization of services in real time will minimize the contact between the doctor and the patient and, as a result, the risks of the spread of COVID-19, while maintaining the ability to effectively manage the treatment process.

When implementing the neurorehabilitation process, it is of great importance which of the technologies will be used to control the effectiveness of the treatment process. Observations of the state and changes in the autonomic nervous system are of great interest, since it is known that "there are practically no such pathological forms in the development and course of which the autonomic nervous system would not play a role." At the same time, changes in heart rate variability are an indicator of autonomic disorders (Vein, 2000).

The device is effectively used in the treatment of vegetative-vascular dystonia, migraine, headache, tension pain, autonomic dysregulation syndrome, headache, hyperhidrosis syndrome, orthostatic hypotension syndrome and postural tachycardia, neurosis-like syndromes and neuropathies of various origins, vestibulopathy, tic disorders, hypertension, sensorineural hearing loss, vasomotor rhinitis, degenerative diseases of vision and atrophy of the optic nerve, glaucoma, computer visual syndrome and asthenopia, drug-resistant epilepsy, attention deficit hyperactivity disorder, children with psychosomatic disorders, panic attacks, anxiety disorders, depressive disorder (Kublanov et al., 2004, 2014, 2016, 2019; Retyunskiy et al., 2017; Petrenko et al., 2018, 2019).

This paper presents three separate clinical cases of the treatment of patients with neuropsychiatric disorders associated with COVID-19, which corresponds to the code U09.9 (ICD-10). The patients' condition was assessed by a psychiatrist using a clinical method and psychometric scales: the Hamilton Depression Rating Scale (HDRS) (Hamilton, 1960), the Beck Depression Self-Assessment Scale (BDI-II) (Powles, Beck, 1974), the Sheehan scale for assessing Anxiety (SPRAS) (Sheehan, 1983), Subjective Asthenia Rating Scale (MFI-20) (Smets et al., 1995). In all cases, a psychiatric disorder was diagnosed by a physician. All patients gave written consent to treatment with an innovative method and the provision of clinical data in this article in anonymized form.

3 RESULTS

The following is a series of clinical cases using DCASNS technology for the treatment of post COVID syndrome.

Patient M, male, 28 years old. Diagnosis: recurrent depressive disorder, current episode severe (F33.2). He suffered COVID-19 in a mild form (self-isolation at home). Patient turned to a psychiatrist for help 6 months after recovery. The patient's anamnesis revealed one depressive episode about 5 years ago. The patient received treatment on an outpatient basis. An antidepressant was used for 6 months with a positive effect. More depressive episodes did not occur, the patient did not use psychotropic drugs.

During the first visit, there were pronounced signs of depression, which was externally manifested by experiences of vital melancholy with an improvement in well-being in the evening, noticeable motor inhibition during the day, depression combined with a slowdown in associative processes, up to subjective thoughts of rapidly growing dementia. The content of thoughts reflected anxiety about life's failures and mistakes, feelings of guilt towards loved ones, excessive concern for health. Suicidal thoughts were steadfastly identified, with which they managed to cope. Complaints - pronounced disturbances in short-term sleep with late falling asleep, frequent awakenings during sleep and early morning awakening 2 hours earlier than usual. Assessment of the severity of symptoms of depression: on the Hamilton scale (HDRS) - 33 points, on the Beck scale (BDI-II) - 54 points.

Conducted 10 sessions of neuroelectrostimulation using DCASNS technology for 3 weeks. Significant improvement was noted: mood was restored, strength and motivation appeared, suicidal thoughts disappeared, sleep was restored. The strength for work has appeared. Assessment of the severity of symptoms of depression: on the Hamilton scale (HDRS) - 7 points, on the Beck scale (BDI-II) - 5 points.

One month after the end of treatment, the condition remains stable. Additional funds, including pharmaceuticals, were not used.

Patient B, female, 23 years old. Diagnosis: panic disorder (F41.0). Has suffered a moderate form of COVID-19 (hospitalization for three weeks; lung damage on X-ray examination of 7%; mechanical ventilation was not performed). Patient turned to a psychiatrist for help 4 months after recovery. Previously, the patient did not go to a psychiatrist.

At the first visit, Patient complained of a lowered mood, frequent panic attacks (sudden attacks of anxiety with a feeling of fear of death, tachycardia, increased blood pressure). Patient was afraid to enter the street, she was afraid in public places, she was afraid to be without help. Patient stopped working as felt a slowdown and disorganization of the thought process. At home, Patient often experienced feelings of melancholy and loneliness with feelings of self-pity. Decreased appetite. Had trouble falling asleep (fell asleep only with the lights on), frequent night awakenings with panic attacks, lack of a sense of rest after a night's sleep. Assessment of the severity of symptoms of depression on the Hamilton scale (HDRS) - 27 points. Severity of anxiety symptoms on the Sheehan scale (SPRAS) - 75 points.

5 sessions of neuroelectrostimulation using DCASNS technology were performed for one week. The frequency and severity of panic attacks decreased. Along with this, a worsening of nocturnal sleep was noted - nocturnal awakenings became more frequent. Another 10 sessions of neuroelectrostimulation using DCASNS technology were carried out for two weeks. There was a slight improvement in the condition - the severity and frequency of panic attacks decreased. Improved night sleep, a feeling of rest after a night's sleep. Assessment of the severity of symptoms of depression on the Hamilton scale (HDRS) - 13 points. Assessment of the severity of symptoms of anxiety on the Sheehan scale (SPRAS) - 32 points.

One month after the end of treatment, there was a complete cessation of panic attacks, an improvement in mood, and a complete restoration of night sleep. She returned to work. Additional funds, including pharmaceuticals, were not used.

Patient D, male, 33 years old. Diagnosis: asthenic disorder (R53). Transferred COVID-19 in a moderate form (hospitalization for five weeks; lung damage by X-ray examination of 22%; was on mechanical ventilation for four days). Patient turned to a psychiatrist for help 6 months after recovery. Previously, the patient did not go to a psychiatrist.

At the first visit, Patient complains of pronounced mood swings in the form of bouts of irritability and exhaustion that quickly follows it. Signs of affective lability with a predominantly low mood with features of moodiness and displeasure, as well as tearfulness, are revealed. Additionally, reports on recurrent headaches, worsening in the evening. Also, notes a pronounced decrease in performance, difficulty concentrating, sleep disturbances (long period of falling asleep, lack of a sense of rest after sleep). Complains of a complete lack of strength. Assessment of the severity of symptoms of depression on the Hamilton scale (HDRS) - 17 points. Assessment of the severity of asthenia symptoms (MFI-20) - 67 points.

15 sessions of neuroelectrostimulation using DCASNS technology were performed over three weeks. There was a gradual improvement in well-being during the treatment. The mood swings and irritability disappeared, sleep improved, strength appeared, the intensity and duration of headaches decreased. Noted a subjective improvement in memory and reaction speed. Assessment of the severity of symptoms of depression on the Hamilton scale (HDRS) - 6 points. Assessment of the severity of asthenia symptoms (MFI-20) - 24 points.

One month after the end of treatment, there were no symptoms of asthenia, a normal night's sleep. He returned to work. Additional funds, including pharmacological preparations, were not used.

4 CONCLUSIONS

The article discusses the possibilities of using multichannel neuroelectrostimulation of the nerve formations of the neck for the treatment of some neuropsychiatric disorders arising from the Post Covid-19 condition.

The positive clinical dynamics as a result of device exposure in all three considered clinical cases is the result of many years of work on the study of the effect of polyfactorial neurostimulation on the structures of the autonomic and central nervous system (Petrenko, 2020). As a result, the DCASNS technique was developed and continues to be improved for the treatment of neuropsychic diseases similar to those presented.

An embodiment of a device with two units (a field shaping unit and a field control unit) with a wireless communication method between the units can be used in telemedicine projects to provide services in real time. Such implementation of the treatment process minimizes the contact between the doctor and the patient. Such technologies will undoubtedly be in demand in the future post-pandemic society.

ACKNOWLEDGEMENTS

The reported study was funded by RFBR according to the research project № 18-29-02052 and supported by Act 211 Government of the Russian Federation, contract № 02.A03.21.0006.

REFERENCES

Bao, Y., Sun Y., Meng S. et al. 2019-nCoV epidemic: address mental health care to empower society // Lancet. 2020. Vol. 395. P. e37-e38

Hamilton, M., 1960. A rating scale for depression. J. Neurol. Neurosurg. Psychiatry 23, 56–62. https://doi.org/10.1136/jnnp.23.1.56

Kang, L., Li Y., Hu S. et al. The mental health of medical workers in Wuhan, China dealing with the 2019 novel coronavirus. // LancetPsychiatry. 2020. Vol. 7, N 3. P. e14

Kubdanov, V.S., Lavrova, S.A., Shershever, A.S., Telegin, A.V., Shmykalov, V.A. Treatment of epilepsy using spatially distributed rotating fields of current pulses. Biomedical Technologies and Radio Electronics, 2004, No. 5-6, p. 4-15.

Kublanov, V., Petrenko, T., Retjunskiy, K. Application of the Non-invasive Adaptive Neuroelectro-stimulation Device for Treatment of Cognitive Impairment in the Model of Attention Deficit Hyperactivity Disorder. Cognitive Sciences, Genomics and Bioinformatics: Proceedings of the 10th Anniversary International Multiconference, Novosibirsk, Russia, 29 August - 2 September 2016. / USA NY: IEEE, 2016. P. 12–16.

Kublanov, V., Shmyrev, V., Shershever, A., Kazakov, Ya., Porshnev, S. and Vasiliev, A. On the innovative capabilities of the SYMPHATOCOR-01 device in neurology with functional disorders of the autonomic and central nervous system, KREMLEVSKAYA MEDICINE Clinical Bulletin, Issue 4, PP. 60-64, December 2014.

Kublanov, V.S., 2008. A hardware-software system for diagnosis and correction of autonomic dysfunctions. Biomed. Eng. 42, 206–212. https://doi.org/10.1007/s10527-008-9047-7

Kublanov, V.S., Babich, M.V., Petrenko, T.S. New Principles for the Organization of Neurorehabilitation. Biomedical Engineering. 2018;52(1):9-13. https://doi.org/10.1007/s10527-018-9771-6

Kublanov, V.S., Petrenko, T.S., Efimcev, A.A. Application of Multichannel Electrical Stimulation of the Neck Nervous Structures in Patients with Depressive Disorders: An fMRI Case Study. BIOSTEC–2019: Proceedings of the 12th International Joint Conference on Biomedical Engineering Systems and Technologies, Prague, Czech Republic, 22-24 February 2019 / Portugal: SCITEPRESS, 2019, Vol.5: NNSNT. P. 564–571.

Lai, J., Ma S., Wang Y. et al. Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019 // JAMA Network Open. 2020. Vol. 3. P. e203976-e203976

Li, H., Xue Q., Xu X. Involvement of the nervous system in SARS CoV-2 infection // Neurotoxicity Res. 2020b. Vol. 38, N 1. P. 1-7

Li, X., Geng M., Peng Y. et al. Molecular immu ne pathogenesis and diagnosis of COVID-19 // J. Pharmaceut. Analysis. 2020a. Vol. 10. P. 102-108

Niazkar, H.R., Zibaee B., Nasimi Q., Bahri N. The neurological manifestations of COVID-19: a review article // Neurol. Sci. 2020

Palacín-Marín, F., Esteban-Moreno, B., Olea, N., Herrera-Viedma, E., Arroyo-Morales, M., 2013. Agreement Between Telerehabilitation and Face-to-Face Clinical Outcome Assessments for Low Back Pain in Primary Care: Spine 38, 947–952. https://doi.org/10.1097/BRS.0b013e318281a36c

Petrenko, T. The effect of non-invasive stimulation of the autonomic nervous system in children with psychosomatic disorders. EPA–2019: Proceedings of the 27th European Congress of Psychiatry, Poland, Warsaw, 6–9 April 2019 / European Psychiatry Journal.

2019. Vol. 56, Sup. 1, P. S226. doi.org/10.1016/ j.eurpsy.2019.01.003

Petrenko, T., Kublanov, V., Retyunskiy, K., Sherstobitov, R., 2020. Possibilities of Applying Non-invasive Multichannel Electrical Stimulation Technology for Treatment Neuropsychiatric Diseases:, in: Proceedings of the 13th International Joint Conference on Biomedical Engineering Systems and Technologies. Presented at the Special Session on Non-invasive Diagnosis and Neuro-stimulation in Neurorehabilitation Tasks, SCITEPRESS - Science and Technology Publications, Valletta, Malta, pp. 421–426. https://doi.org/10.5220/0009377304210426

Petrenko, T., Retjunskiy, K., Kublanov, V. [PW0443] Efficacy of multichannel electrical stimulation of neck nervous structure in patients with panic disorders. 26th European Congress of Psychiatry / European Psychiatry. European Psychiatry Journal, March 2018, Vol. 48, Supplement 1, P. S243. doi.org/10.1016/j.eurpsy.2017.12.016

Powles, W.E., 1974. Beck, Aaron T. Depression: Causes and Treatment. Philadelphia: University of Pennsylvania Press, 1972. Pp. 370. $4.45. Am. J. Clin. Hypn. 16, 281–282. https://doi.org/10.1080/000291 57.19 74.10403697

Rahman, J., Muralidharan A., Quizi S. et al. Neurological and psychological effects of Coronavirus (COVID-19): an overview of the current era pandemia // Cureus. 2020. Vol. 12, N 6. P. e8460

Retyunskiy, K.Yu., Fedotovskih, A.V., Petrenko, T.S., Kublanov V.S. The recovery of cognitive functions for patients with the organic amnestic syndrome by means of the non-invasive adaptive neuroelectrostimulation device. Psychopathology and Addiction Medicine 2.1 June 2017 p. 52-56.

Sheehan, D.V., Sheehan, K.H., 1983. The Classification of Phobic Disorders. Int. J. Psychiatry Med. 12, 243–266. https://doi.org/10.2190/LNA4-1U6E-9WTW-31JU

Smets, E.M.A., Garssen, B., Bonke, B., De Haes, J.C.J.M., 1995. The multidimensional Fatigue Inventory (MFI) psychometric qualities of an instrument to assess fatigue. J. Psychosom. Res. 39, 315–325. https://doi.org/10.1016/ 0022-3999(94)00125-O

Talevi, D., Socci V., Carai M. et al. Mental health outcomes of the CoViD-19 pandemic // Riv. Psichiatr. 2020. Vol. 55, N 3. P. 137-144

Taquet, M., Geddes J.R., Husain M., Luciano S., Harrison P.J. 6-month neurological and psychiatric outcomes in 236 379 survivors of COVID-19: a retrospective cohort study using electronic health records. Lancet Psychiatry. 2021 May;8(5):416-427. doi: 10.1016/S22 15-0366(21)00084-5. Epub 2021 Apr 6. PMID: 33836148; PMCID: PMC8023694.

Thu, T.P.B., Ngoc P.N.H., Hai N.M., Tuan L.A., 2020. Effect of the social distancing measures on the spread of COVID-19 in 10 highly infected countries. Sci. Total Environ. 742, 140430. https://doi.org/10.1016/ j.scitotenv.2020.140430

Umapathi, T., Quek W.M.J., Yen J.M. et al. Encephalopathy in COVID-19 patients; viral, parainfectious, or both? // eNeurological. Sci. 2020. Vol. 21. P.100275

Vein, A.M. Autonomic disorders: Clinical presentation, diagnosis, treatment. Momkva: MIA, 2000 .-- 749 p. - ISBN 5-89481-066-3

Whittaker, A., Anson M., Harky A.. Neurological Manifestations of COVID-19: A systematic review and current update // Acta Neurol. Scand. 2020. Vol. 142, N 1. P.14-22

World Health Organization, Who survey (2020). COVID-19 disrupting mental health services in most countries. [Online]. Available: https://www.who.int/news/item/ 05-10-2020-covid-19-disrupting-mental-health-services-in-most-countries-who-survey (accessed 12.6.21)