

Bio-psycho-social impact of extremely challenging health conditions (covid-19)

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Abstract

The outbreak of the COVID-19 pandemic is present in everyone's lives. Key aspects of the CoViD-19 pandemic also demonstrate an association between restriction of movement, socioeconomic impact on mental illness, and the risk of long-term physiological and psychological consequences (Talevi et al., 2020). The effective introduction of social distance protocols can significantly limit the prevalence of COVID-19 throughout the community. A medical measure in the case of infectious diseases thus maintains the functioning of the health system against overload, which exceeds the ability to treat complications associated with COVID-19. On the other hand, biological health can be affected by untreated other diseases, and mental health problems and changed psychosocial characteristics. The consequences of the COVID-19 pandemic are likely to be significant, and will also affect the approach to effective healthcare delivery as long-term health protection (O'Neil et al., 2020). In order to maintain the continuity of health care in this pandemic situation, several clinical treatments can be reconsidered that would take into account the specific bio-psycho-social characteristics of the individual. Keywords: COVID-19, SARS-CoV-2, mental health, psycho-social health

Bio-psiho-socialni vpliv izredno zahtevnih zdravstvenih razmer (covid-19)

Povzetek

Pojav koronavirusne bolezni (COVID-19, SARS-CoV-2) je posegel v življenja vseh. Ključni vidiki pandemije COVID-19 so tudi povezanost omejitve gibanja, socialno-ekonomskega vpliva ter duševnih bolezni z nevarnostjo tveganja za dolgoročne fiziološke in psihološke posledice (Talevi in sodel., 2020). Učinkovita uvedba protokolov za socialno oddaljevanje lahko znatno omeji širjenje COVID-19 v celotni skupnosti. Zdravstveni ukrep v primeru nalezljivih bolezni tako ohranja delovanje zdravstvenega sistema pred preobremenitvijo, ki presega zmožnosti zdravljenja zapletov. Na drugi strani pa so lahko s tem prizadeti zdravstvena oskrba preostalih prisotnih bolezni ter duševno zdravje in psihosocialne značilnosti družbe. Posledice pandemije COVID-19 bodo verjetno precejšnje, vplivale bodo tudi na pristop k učinkovitemu izvajanju zdravstvenega varstva (O'Neil in sodel., 2020). Da bi ohranili kontinuiteto zdravstvene oskrbe v tej pandemični situaciji, je mogoče razmisliti o več smereh klinične obravnave, ki bodo upoštevale bio-psiho-socialne značilnosti posameznika. Ključne besede: COVID-19, SARS-CoV-2, mentalno zdravje, psiho-socialno zdravje

1. INTRODUCTION

Mental health or clinical well-being can be an overlooked and marginalized aspect of our lives. In the hustle and bustle of everyday life, self-care can often be the last priority, depending on professional or other societal demands and expectations. If we are not aware of this at the beginning, we will certainly be aware in the end that without self-care we will have nothing left and that we are responsible caregivers of our health, if we want to do our job well and take care of others. Researchers describe the current global health situation of coronavirus disease (COVID-19, SARS-CoV-2), as an example of a “world war”, with all the accompanying anxieties and disorders we can imagine when fighting the invisible enemy on our doorstep (Bansal et al., 2020). We are faced with a new reality that has changed our culture, implicit assumptions and basic underpinnings have become our daily additional or priority concern. The “stay at home” mandate tasks and social norms on quarantine seem to have appeared in some geographical areas uncontrollably overnight. Many healthcare organizations consider the inconsistencies that contribute to health risk assessment. Last but not least, the evidence shows that even medical researchers or health professionals occasionally lose balance, therefore our patients certainly feel the same way (Bansal et al., 2020).

Clinical rehabilitation and bio-psychosocial vulnerability

Chevance et al. (2020) identified four main vulnerabilities among patients with mental disorders: (1) concomitant medical diseases, more commonly found in patients with mental disorders (cardiovascular and pulmonary pathologies, diabetes, obesity, etc.), and perceived as risk factor risks of covid-19 infection; (2) age (the elderly represents the population most susceptible to coronavirus); (3) cognitive and behavioral disorders that may impede compliance with social distance and hygiene measures and, ultimately, (4) psychosocial vulnerability as a result of stigma and / or socio-economic problems.

In addition, the mental health care system is more vulnerable than other health systems. Current government plans are ill-suited for psychiatric institutions in the context of a severe shortage of organizational, material and human resources. Furthermore, because of certain structural aspects, health facilities are particularly vulnerable due to bed occupancy, ward saturation, mental health facilities are closed, and health care teams are understaffed and poorly trained to deal with infectious diseases. In case of hospitalization, after the end of hospitalization and / or recovery in the home environment, it is recommended to use videoconferencing to maintain social contacts and monitor health status, which makes the development of support platforms in this context very useful (telemedicine). We agree with researchers (Chevance et al., 2020) that global physical as well as mental health is now facing a great urgent need for reorganization, and in the future, it must also prepare for an epidemic of emotional disturbances due to population confinement.

2. METHODS

Pathophysiological processes after COVID-19 infection

Morris et al. (2020) represent a model for understanding the pathophysiological processes of COVID-19, starting with infection of human alveolar epithelial cells type II (pneumocytes) with SARS-CoV-2 and culminating in the development of acute respiratory distress syndrome (ARDS). The innate immune response to infection of type II alveolar epithelial cells leads both to their death by apoptosis and pyroptosis and to the activation of alveolar macrophages. Activated macrophages secrete proinflammatory cytokines and chemokines and tend to polarise into the inflammatory M1 phenotype. These changes are associated with the activation of vascular endothelial cells and thus the recruitment of highly toxic neutrophils and inflammatory activated platelets into the alveolar space. Activated vascular endothelial cells become a source of inflammatory cytokines and reactive oxygen species (ROS) and contribute to the development of coagulopathy, systemic sepsis, cytokine storms, and ARDS. Pulmonary activated platelets are also an important source of proinflammatory cytokines and ROS, as well as exacerbating pulmonary neutrophil-mediated inflammatory responses and contributing to systemic sepsis by binding to neutrophils to form platelet-neutrophil complexes (PNCs). PNC formation

increases neutrophil recruitment, activation priming and extraversion of these immune cells into inflamed pulmonary tissue, thereby contributing to ARDS. Sequestered PNCs cause the development of a procoagulant and proinflammatory environment. The contribution to ARDS of increased extracellular histone levels, circulating mitochondrial DNA, the chromatin protein HMGB1, decreased neutrophil apoptosis, impaired macrophage efferocytosis, the cytokine storm, the toll-like receptor radical cycle, pyroptosis, necroinflammation, lymphopenia and a high Th17 to regulatory T lymphocyte ratio are detailed.

Due to its exceptional droplet transmission and human contact, it became a pandemic within a few months. There is no effective therapy available today, and the scientific community is working to find a therapeutic choice to combat this silent enemy. Studies are underway on a number of therapeutic options, including antiviral drugs, immunomodulatory drugs, and immunotherapy. Mascolo et al. (2020) describe viral properties, including the ability to trigger an inflammatory response that appears to be a stronghold of the pathogenic action of COVID-19, and immunotherapy could present a promising alternative to waiting for a vaccine. A high dose of intravenous immunoglobulin already used in other infectious diseases could be an effective aid (Mascolo et al., 2020).

3. RESULTS

Psychological and mental health of the elderly in a pandemic situation

The world is experiencing a catastrophic situation unprecedented due to the COVID-19 virus. In addition to actions to avoid infection, there are also concerns and respect for the most vulnerable groups in society, such as older adults, and a persistent strength to overcome the COVID-19 crisis from start to finish. Researchers are studying the urgency and importance of the psychological and mental health of older people in the pandemic situation caused by COVID-19, and are proposing several psychological factors and strategies to protect mental health. Lee et al. (2020), emphasize the need to set the guidelines for maintaining psychological and mental health in the current pandemic situation and in to prepare for future disasters that may be caused by an epidemic. In addition, the focus is useful for understanding and extending guidelines and strategies for psychological and mental health. The authors emphasize the need to develop psychological support services and vaccination programs that meet the special needs of individuals from age to groups, as well as studies on the introduction of a system of permanent psychological support. Second, they stress the need for research on prevention strategies for the rising suicide rate in the economic crisis under COVID-19. Third, to prevent paralysis of the health care system in pandemic conditions, it makes sense to conduct studies on the establishment of a response system for epidemic-psychiatric emergencies. Finally, studies are needed on facilities where urgent psychiatric medical intervention can be provided in a pandemic situation.

4. DISCUSSION

Rehabilitation solutions for patients with psychological distress

Many researchers suggest assessing the applicability of telemedicine and digital rehabilitation in the event of challenging medical conditions. Wei et al. (2020) provided an Internet-integrated intervention that focused on relaxation, self-care, and raising a sense of security for patients with COVID-19 with psychological distress. Preliminary results from this study showed a positive effect of Internet integrated intervention on mild to moderate symptoms of depression and anxiety.

Gillett and Jordan (2020) report a case of a healthcare professional in a pandemic period. The previously well-prepared 37-year-old male healthcare professional developed confusion, psychotic symptoms and a suicide attempt after a new diagnosis of COVID-19. After surgery and an extended admission to the intensive care unit, he recovered well in both physical and mental health. A number of factors are likely to have contributed to the incidence of health complications, including SARS-CoV-2 infection, severe insomnia, anxiety, healthcare worker stress, and the unique social and psychological stressors associated with the COVID-19 pandemic. This case highlights the need to further characterize the specific psychiatric consequences of COVID-19 in the community environment and should remind

general practitioners and rehabilitation professionals to pay attention to comorbid psychiatric symptoms when evaluating patients with newly diagnosed COVID-19.

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Existing psychosis and meeting the requirements to limit infectious diseases

Health measures to curb infectious diseases represent a decisive change in everyday life. Restrictions would normally not be expected in healthy individuals, and greater barriers are present in individuals with existing health problems such as psychoses. Psychosis in patients with coronavirus can pose a major challenge and potential risk for infection control for both clinical healthcare professionals and society as a whole. In addition to psychosis, Brown et al. (2020) present, some evidence showing cases of extreme psychosocial stress in people who have not been affected before. The important question for the current provision of mental health services is whether patients with pre-existing psychosis able to meet the social distance and personal hygiene requirements demanded during the course of infectious diseases, posing a potential risk to the community and mental health physicians. The current COVID-19 pandemic offers a global opportunity for more accurate and high-quality exploration of findings. Much can be speculated about the consequences of the COVID-19 pandemic for individuals with psychosis, but certainly, according to current literature, the population is disadvantaged and proactive research is needed (Brown et al., 2020).

The necessity of studying modern rehabilitation strategies

Public health crises, such as the outbreak of severe acute coronavirus 2 syndrome (SARS-CoV-2) since December 2019, are widely recognized as severe traumatic events causing not only physiological problems but also psychological distress to infected patients. During this time numerous authors have designed an Internet-integrated intervention and evaluated its efficacy in depressive and anxiety symptoms in patients infected with SARS-CoV-2 (Wei et al., 2020).

Many researchers are already reporting a bio-psycho-social impact following the Covid-19 pandemic. Talevi et al. (2020) also highlight the critical outcomes of the CoViD-19 pandemic, expressed in socioeconomic impact and mental health. The long-term effects of physiological as well as psychological consequences will be the subject of long-term discussions, so research is needed that will also examine rehabilitation strategies in the event of an emergency, such as a pandemic.

Moreno et al. (2020) represent the COVID-19 pandemic with effects on mental health and some of these effects might continue. The psychological tax of illness is already evident in the general population, especially in people with mental disorders (particularly those with severe mental illness and cognitive impairment) and workers in difficult health conditions. The state of both physiological and mental health changed rapidly during the pandemic and it will be necessary to coordinate sustained responses to the challenges. Despite heterogeneity in political, social and health systems, mental health services around the world have introduced acute responses focusing on infection control, continuity of care for mental health service users and facilitating access to mental health assessment and care for patients with new problems and patients with high risk (Moreno et al., 2020).

Health priorities - consistency, accessibility, feasibility, confidentiality and level of risk for infections

The COVID-19 pandemic has encouraged rapid and widespread adoption of telemedicine. The placement of physicians, long travel distances, and mobility impairments or restrictions limit access to care, especially for people with Parkinson's disease (Dorsey et al., 2020). Telemedicine is not the solution to all medical or health challenges, but it offers benefits. These benefits are summarized by the authors as care, convenience, comfort, confidentiality and infection (5 C), represented by affordable care, convenience, greater comfort, greater patient and family confidentiality and now reduced risk for infection. Telemedicine also has its limitations, including the inability to perform parts of the physical

examination and unfair access to the Internet and related technologies. The development of future models will provide patients with care including a variety of specialties. Mental health professionals, physiotherapists, neurosurgeons, speech therapists, dieticians, social workers and trainers will certainly be involved in this role in the future. Along with these new models of care, digital therapy, defined as software-assisted therapy, is also emerging. Telemedicine is now being introduced as a bridge to restart clinical trials and will increasingly become a normal part of future research studies. From this pandemic, many new telemedicine approaches will emerge that will fundamentally change and improve care and clinical rehabilitation research.

Potential adequacy of equitable and timely access to digital health services

The COVID-19 pandemic has necessitated a shift from personal to remote psychotherapy (e.g., teletherapy, e-health, video conferencing). This results in potential adequacy in terms of the need for fair and timely access to mental health services in remote and rural locations. COVID-19 may increase the demand for timely, virtual services among populations affected by trauma, including public safety personnel (PSP e.g., paramedics, police, firefighters, correctional officers), military members, and veterans. So far, there is a lack of evidence on the question of whether the digital implementation of trauma therapies for military personnel, veterans and PSPs leads to similar results as personal interventions. Information on barriers and accelerators, as well as recommendations on digital care, are also scarce. Jones et al. (2020) assessed the scope and quality of peer-reviewed literature on psychotherapeutic digital health interventions performed remotely on military personnel, veterans, and PSP, and synthesized knowledge of needs, gaps, barriers, and moderators for virtual assessment of virtual intervention for posttraumatic stress injury. 38 studies were included in the review work. Evidence of the efficacy of digital prolonged exposure therapy, cognitive processing therapy, behavioral activation therapy with therapeutic exposure to military personnel, veterans, and PSPs was assessed at level 1a, while evidence of cognitive behavioral therapy was conflicting. Data synthesis has shown that the virtual implementation of these therapies can be just as effective as personal, can reduce stigma and cost, while increasing access to therapy. Issues of risk, safety, potential harm (i.e., suicide, avoidance), privacy, safety, and matching between therapist, modality, and patient require further consideration. There is a lack of studies on the influences of sexual, racial and cultural factors that could lead to different outcomes, desires and / or needs. Other therapies that may be suitable for digital delivery need to be investigated. Jones et al. (2020) conclude that the digital implementation of trauma therapies for military personnel, veterans, and PSPs is a critical area for further research. Although there is promising evidence of the effectiveness of digital health in these populations, many questions remain and a cautious approach to wider implementation is needed.

5. CONCLUSION

The implementation of a physical and mental health monitoring system related to COVID-19, which includes results associated the use of mental health services, would encourage practice and could help shape the optimal rehabilitation of overall health for future periods. We agree with researchers (Moreno et al., 2020) that service delivery needs to individualize medicine and the rehabilitation process: effective practices that already exist need to be improved and expanded, and the usefulness and limitations of mutual support and distance health care recognized.

A focus on accountability based on rehabilitation diagnostics of meaningful and evaluated outcomes, co-production of service planning and evaluation by extending health insurance to overall health and promoting primary health care support and its greater integration with secondary and tertiary care could further help maintain health care conditions after a pandemic.

Some of the new approaches that have been developed appear to be effective, but may still be associated with risks. It's important to maintain existing services and promote new practices that expand access and provide cost-effective provision of effective mental health services to individuals who already have a mental disorder or have developed during a pandemic.

The COVID-19 pandemic will pass and although it is likely to remain seasonally present over the next few years and allergy and immunological practices will continue to provide key services, even though our infrastructure is temporarily reorganized in the meantime (Bansal et al., 2020). The present social distance and distress of the coronavirus atmosphere will in its own way mark the health of many. At the same time, a pandemic with negative stress, distress, provides insights into the essence of the importance of science, perhaps not in a normal state, but certainly, in a state of demanding health conditions.

6. REFERENCES

1. Talevi D, Socci V, Carai M, Carnaghi G, Faleri S, Trebbi E, di Bernardo A, Capelli F, Pacitti F. *Mental health outcomes of the CoViD-19 pandemic. Riv Psichiatr.* 2020 May-Jun;55(3):137-144.
2. O'Neil A, Nicholls SJ, Redfern J, Brown A, Hare DL. *Mental Health and Psychosocial Challenges in the COVID-19 Pandemic: Food for Thought for Cardiovascular Health Care Professionals. Heart Lung Circ.* 2020 Jul;29(7):960-963.
3. Bansal P, Bingemann TA, Greenhawt M, Mosnaim G, Nanda A, Oppenheimer J, Sharma H, Stukus D, Shaker M. *Clinician Wellness During the COVID-19 Pandemic: Extraordinary Times and Unusual Challenges for the Allergist/Immunologist. J Allergy Clin Immunol Pract.* 2020 Jun;8(6):1781-1790.e3.
4. Chevance A, Gourion D, Hoertel N, Llorca PM, Thomas P, Bocher R, Moro MR, Lapr evote V, Benyamina A, Fossati P, Masson M, Leaune E, Leboyer M, Gaillard R. *Ensuring mental health care during the SARS-CoV-2 epidemic in France: A narrative review. Encephale.* 2020 Jun;46(3):193-201.
5. Morris G, Bortolasci CC, Puri BK, Olive L, Marx W, O'Neil A, Athan E, Carvalho AF, Maes M, Walder K, Berk M. *The pathophysiology of SARS-CoV-2: A suggested model and therapeutic approach. Life Sci.* 2020 Oct 1;258:118166.
6. Mascolo S, Carleo MA, Contieri M, Izzo S, Perna A, De Luca A, Esposito V. *SARS-CoV-2 and inflammatory responses: from mechanisms to the potential therapeutic use of intravenous immunoglobulin. J Med Virol.* 2020 Nov 5.
7. Lee K, Jeong GC, Yim J. *Consideration of the Psychological and Mental Health of the Elderly during COVID-19: A Theoretical Review. Int J Environ Res Public Health.* 2020 Nov 3;17(21):8098.
8. Gillett G, Jordan I. *Severe psychiatric disturbance and attempted suicide in a patient with COVID-19 and no psychiatric history. BMJ Case Rep.* 2020 Oct 31;13(10):e239191.
9. Wei N, Huang BC, Lu SJ, Hu JB, Zhou XY, Hu CC, Chen JK, Huang JW, Li SG, Wang Z, Wang DD, Xu Y, Hu SH. *Efficacy of internet-based integrated intervention on depression and anxiety symptoms in patients with COVID-19. Epub* 2020 Jul 31.
10. Brown E, Gray R, Lo Monaco S, O'Donoghue B, Nelson B, Thompson A, Francey S, McGorry P. *The potential impact of COVID-19 on psychosis: A rapid review of contemporary epidemic and pandemic research. Schizophr Res.* 2020 Aug;222:79-87.
11. Moreno C, Wykes T, Galderisi S, Nordentoft M, Crossley N, Jones N, Cannon M, Correll CU, Byrne L, Carr S, Chen EYH, Gorwood P, Johnson S, K rkk inen H, Krystal JH, Lee J, Lieberman J, L pez-Jaramillo C, M nnikk  M, Phillips MR, Uchida H, Vieta E, Vita A, Arango C. *How mental health care should change as a consequence of the COVID-19 pandemic. Lancet Psychiatry.* 2020 Sep;7(9):813-824.
12. Dorsey ER, Okun MS, Bloem BR. *Care, Convenience, Comfort, Confidentiality, and Contagion: The 5 C's that Will Shape the Future of Telemedicine. J Parkinsons Dis.* 2020;10(3):893-897.
13. Jones C, Miguel-Cruz A, Smith-MacDonald L, Cruikshank E, Baghoori D, Kaur Chohan A, Laidlaw A, White A, Cao B, Agyapong V, Burbach L, Winkler O, Sevigny PR, Dennett L, Ferguson-Pell M, Greenshaw A, Br mault-Phillips S. *Virtual Trauma-Focused Therapy for Military Members, Veterans, and Public Safety Personnel With Posttraumatic Stress Injury: Systematic Scoping Review. JMIR Mhealth Uhealth.* 2020 Sep 21;8(9):e22079.