
Remote Educational Interventions for Children with Autism Spectrum Disorder: Lessons Learnt from COVID-19 Pandemic in India

Dattatreya Rai

Department of Rheumatology, All India Institute of Medical Sciences,
New Delhi, India

ORCID: <https://orcid.org/0000-0002-8975-2609>, e-mail: dattatreyraiy@yahoo.co.in

Jayanti Pujari

Amity University, Gautam Budha Nagar,
Noida, India

ORCID: <https://orcid.org/0000-0003-1414-5764>, e-mail: jpujari@amity.edu

Backgrounds and Aims. The coronavirus leads to a contagious disease that triggers severe acute respiratory symptoms. It was initially detected in December 2019 in Wuhan, China, and has since led to a global pandemic. In India, the first case was reported in Kerala in January 2020. The pandemic resulted in sudden closure of intervention centres for children with Autism Spectrum Disorders (ASD) across India resulting in change in rehabilitation measures for them. A brief survey was used to identify challenges faced by rehabilitation workers in tele-rehabilitation with children with autism spectrum disorder.

Methods. Responses of Rehabilitation workers (n=44) engaged with tele-rehabilitation of children with ASD were collected using online survey using Google forms. Both open and closed ended questionnaires were used to elicit response. We conducted organized interviews with special educators. Online tools were used to record responses of special educators in providing tele-rehabilitation services.

Results and Discussion. Behavioural issues, Information Technology, parental approach as well as the home environment were identified as some of the major challenges encountered in online interventions with children with ASD. Rehabilitation professionals faced a range of challenges in continuing and maintaining online intervention to children with ASD most of which included behaviour problems in children with ASD, parental attitude and home environment. In general, online interventions proved effective for tele-rehabilitation during COVID-19, supporting children with autism, though reasons for their success need further study.

Keywords: autism spectrum disorder (ASD); online-intervention; COVID-19 pandemic; mental health helpline; rehabilitation

Acknowledgements: The authors are grateful to Dr Uma Kumar, Head of Department, Department of Rheumatology AIIMS New Delhi; Director, National Institute for Empowerment of Persons with Intellectual Disabilities, Secunderabad and Director of charitable school for physically disabled children Mata Bhagwati Chadha Niketan, Noida, Uttar Pradesh for administrative approvals.

For citation: Rai D., Pujari J. Remote Educational Interventions for Children with Autism Spectrum Disorder: Lessons Learnt from COVID-19 Pandemic in India. *Autizm i narusheniya razvitiya = Autism and Developmental Disorders*, 2024. Vol. 22, no. 4, pp. 13–20. DOI: <https://doi.org/10.17759/autdd.2024220402> (In English, abstract in Russian)

Онлайн-методы работы с детьми с расстройствами аутистического спектра: уроки, извлеченные из пандемии COVID-19 в Индии

Даттатрея Рай

Отделение ревматологии, Всеиндийский институт медицинских наук,
Нью-Дели, Индия

ORCID: <https://orcid.org/0000-0002-8975-2609>, e-mail: dattatreyra@gmail.com

Джаянти Пуджари

Университет Амита, Гаутама Будха Нагар,
Нойда, Индия

ORCID: <https://orcid.org/0000-0003-1414-5764>, e-mail: jpujari@amity.edu

Актуальность и цель. Заболевание коронавирусом вызывает острые респираторные симптомы. Впервые вирус был обнаружен в декабре 2019 года в Ухане, Китай, и с тех пор распространился до уровня глобальной пандемии. Первый случай в Индии был зарегистрирован в Керале в январе 2020 года. В период пандемии произошло внезапное закрытие центров, оказывающих помощь детям с расстройствами аутистического спектра (РАС) по всей Индии, что привело к трудностям в оказании реабилитационной помощи. Был проведен небольшой опрос специалистов, которые работают в системе реабилитации детей с РАС, направленный на выявление сложностей использования телемедицинских и телереабилитационных технологий.

Методы. Был проведен онлайн-опрос 44-х респондентов, занимающихся в основном детьми с РАС телереабилитацией. Опрос проводился с помощью форм Google. Для получения ответов использовались как открытые, так и закрытые вопросы. Помимо этого, были проведены интервью со специальными педагогами. Для фиксации ответов в ходе интервью применялись онлайн-инструменты.

Результаты и обсуждение. Поведенческие трудности, проблемы с оборудованием, родительский фактор, а также фактор домашней среды были определены как наиболее проблемные области при организации работы онлайн с детьми, имеющими РАС. При продолжении онлайн-практик были выделены такие проблемные области как поведенческие трудности, родительская позиция, домашняя среда. В целом, онлайн вмешательства показали результативность в рамках реабилитации и поддержки для детей с РАС во время пандемии COVID-19. При этом требуются дополнительные исследования причин данной результативности.

Ключевые слова: расстройства аутистического спектра (РАС); онлайн-практики; пандемия COVID-19; горячая линия по вопросам психического здоровья; реабилитация

Благодарности: Авторы выражают благодарность доктору Уме Кумар, заведующей отделением ревматологии AIIMS Нью-Дели; директору Национального института по расширению прав и возможностей лиц с ограниченными интеллектуальными возможностями, Секундерабад, и директору благотворительной школы для детей с особенностями развития Мата Бхавата Чадхе Никетан, Нойда, Уттар-Прадеш, за административную поддержку.

Для цитаты: Рай Д., Пуджари Д. Онлайн-методы работы с детьми с расстройствами аутистического спектра: уроки, извлеченные из пандемии COVID-19 в Индии // Аутизм и нарушения развития. 2024. Том 22. № 4. С. 13–20. DOI: <https://doi.org/10.17759/autdd.2024220402>

Introduction

COVID-19 resulted in severe acute respiratory distress. First erupted in December 2019 in Wuhan, China and had later turned out to be an ongoing pandemic. With declaration of corona virus 2019 as pandemic, there were reports of increased prevalence of physical symptoms observed in general population. COVID-19 has created a worldwide stress. Many lives have been lost and there has been tremendous effect on physical and psychological wellbeing.

In line with containment measures, special schools were also closed. Children with autism spectrum disorder (ASD) were devoid of direct face to face specialist educational intervention by special education teachers. The problem further increased when children with ASD belonged to poor socio-economic status. Their parents had lost livelihoods and had less access to information technology and internet. Continuing Individualised Education Plan (IEPs) in prevailing conditions was a massive challenge. India serves children with autism spectrum disorders through a net-

work of government schools and NGOs. Use and choice of technology interface for autism specific intervention is more of an individual choice and effort rather than an outcome of institutional support infrastructure.

Rehabilitation professionals from a prominent Non-Government Organisation, a premier Special School run by apex National Institute of Government of India and many Integrated schools being run by state government were approached with aim to explore the ways that they utilised to complete IEPs for children with ASD. Many intervening factors that facilitate educational intervention were also explored.

COVID-19 Spread

Origins of COVID-19 pandemic has been accounted and debated as a zoonotic spill over occurred prior to the officially accepted timing of early December, 2019. Six countries had exceptionally early cases. On Dec 31, 2019, China reported a cluster of cases of pneumonia in people at Wuhan, Hubei Province. The responsible pathogen is a novel corona virus, named severe acute respiratory syndrome corona virus 2 (SARS-CoV-2). The disease spread quickly to other parts of the world outside China.

In January 2020, the first case of corona virus (COVID-19) in India was identified in Kerala. There have been measures to contain the spread of disease. Lockdown, social distancing, use of mask, use of odd- even days for attendance in offices were some of the measures that have been adapted to contain spread of the disease. India experienced four lockdown phases from March 25, 2020, to May 31, 2020, followed by two unlock phases from June 1, 2020, to July 31, 2020 [27]. With the onset of COVID, India made several precautionary measures. However, with the denser population of the country it would not be simple to control community spread. In India, containment strategies included identifying and tracing contacts, quarantine measures, social distancing, and adhering to other health advisories issued from time to time by Ministry of Health and Family welfare, Govt of India. Current treatment protocols involve real-time PCR tests and Point-of-Care molecular diagnostic assays for diagnosis. Additionally, some states in India have pressed in pool testing [23].

The outbreak of COVID taught us that change is inevitable. It has acted as a catalyst for educational institutions to develop platforms using previously unused technologies. The education sector has been striving to overcome the crisis by adopting a different approach and digitizing challenges to mitigate the threat of the pandemic [13]. India as a country, has made numerous efforts related to launch and adoption of e-Governance initiatives, which has been introduced in various fields. However, except a few, most of such initiatives have not been able to deliver the desired results over the longer course of time, resulting in underutilization of public funds [26].

There has been psychological impact of the COVID-19 pandemic in India. Specifically, social, psychological, and

systemic factors that have adverse implications [15]. After a spike in COVID-19 cases in June 2020, India became the third most affected country globally. Initially, the country had fewer cases and lower fatality rates, largely due to a strict lockdown and a favourable demographic profile. However, low health expenditure as a percentage of GDP resulted in insufficient hospital beds, ventilators, and medical personnel, particularly in the public health sector. Despite these challenges, technological advancements and a strong health research foundation have played a crucial role in addressing the pandemic [9].

COVID-19 pandemic is much beyond biological phenomena. They have psychosocial and economic implications that might long outlast the infection itself [4]. Few studies reveal that urbanization, higher workforce participation, greater population density, and higher income levels contribute to the increased prevalence of COVID-19. There is a positive correlation between urban primacy, slum households, and COVID-19 cases, while a negative relationship exists between health infrastructure, parks, and COVID-19 [28]. Ever since COVID-19 was declared a pandemic, leading to a nationwide lockdown, a majority of people in India have faced a myriad of hardships, with mental health crisis being the most prominent one [11].

Learning Variables among Children with ASD

Autism Spectrum Disorder (ASD) encompasses a range of lifelong neurodevelopmental disorders. Historically, the most frequent diagnoses included intellectual disability, psychoses, personality disorders, and depression. This underscores the importance of differential diagnosis in children with ASD [7]. Motor and communication comprising both verbal and non-verbal skills are connected and a pathogenetic role of early motor dysfunctions in the development of autism. Early enabling intervention is essential at improving motor skills, which could also have favourable effects on other aspects of development [1]. Recent studies in this field indicate that employing robots as collaborators can positively impact the development of social skills in children with ASD, particularly in areas where they exhibit significant deficits [29].

Impact of COVID-19 on Children with ASD

Children, adolescents, and adults with autism spectrum disorder (ASD) are especially vulnerable, affected by stay-at-home orders, the closure of nonessential services, and social distancing measures. The pandemic has led to various educational and vocational changes, disruptions to home and leisure routines, restricted access to behavioural health services, and alterations in the delivery of health services [6]. Even though transportation and mobility for community participation is difficult for persons with Autism Spectrum Disorders (ASD) under normal circumstances itself, the impact of COVID-19 made access even more challenging [19].

Finally, ASD status (in particular, age and gender of child with ASD, and severity of his/her symptoms) had a significant impact on parental stress and emotional well-being. Moreover, parental stress and emotional well-being were negatively impacted by the frequency and usefulness of ASD support received during the pandemic [2]. Caring for someone with autism spectrum disorder (ASD) can be stressful even under ideal conditions, and the COVID-19 pandemic has significantly increased the stress levels for families living with an individual with ASD [17].

Learning in Autism Spectrum Disorders

Neuro-developmental disabilities can be detected reliably and with validity in children as young as 4 months of age by using the instruments such as the Ages and Stages Questionnaire [25]. Students with ASD face unique learning challenges such as controlling behaviour and emotion, inability to tune out unnecessary information, lack of social skills, short attention span, repetitive behaviour, fixation, communication due to nonverbal and limited vocabulary and inability to coordinate between objects and people around them which are required for optimal level engagement in inclusive classroom [24].

A local processing bias, often seen as a cognitive style specific to autism spectrum disorder (ASD), may affect the types of semantic features that children with ASD acquire and could lead to difficulties in word learning [8]. There is need for teachers to focus on Social Emotional Learning, Parent Training and field experiences with a mentor. A range of educational/treatment approaches is currently available for young children with autism spectrum disorders (ASD). SCERTS Model prioritizes Social Communication, Emotional Regulation, and Transactional Support are the key developmental dimensions that needs attention in a comprehensive program aimed at supporting the development of young children with ASD and their families [20].

Online Intervention for Children with Autism Spectrum Disorder

Telemedicine (TM) is used to treat patients in a remote location by using telecommunication technology. It exchanges the medical information and data from one location to another through advanced technological innovation. During this COVID-19 pandemic lockdowns telemedicine is beneficial to healthcare to minimize social distance [3]. In the aftermath of a disaster, medical infrastructure is often significantly impacted or destroyed in the affected zone. In such a system of telemedicine can improve access to health services and increase survival rates in emergency situations spanning both geographical and time zones [14].

Many departments and hospitals of Govt. of India launched help lines to offer services during lockdown. Kiran Mental Health & Rehabilitation Helpline was launched by Department of Empowerment of Persons with Disabili-

ties (DEPwD), Ministry of social justice & empowerment, Govt of India on 7th Sept 2020 which continues to serve people in distress. The “Kiran” Mental Health Rehabilitation Helpline number, 1800-599-0019, provides callers support for early screening, first-aid, psychological support, distress management, mental well-being, preventing deviant behaviors, psychological crisis management etc. The helpline offers services in thirteen languages. It supports those going through mental health issues, particularly during the COVID-19 pandemic. Knowledge of availability of this helpline may improve quality of rehabilitation care to children with autism spectrum disorders.

Telehealth or online communication technologies may lessen the gap between intervention requirements for children with autism spectrum disorders (ASDs) and the available resources to provide these services. Tele-rehabilitation offers a quick and effective option to respond to the specialist rehabilitation needs of COVID-19 survivors following hospital discharge [21]

Tele-rehabilitation, delivered through a generic prescription platform and mobile app, can effectively provide rehabilitation to patients. During the COVID-19 pandemic, tele-rehabilitation has been widely and successfully used to prevent service disruptions. The findings also indicate a high level of satisfaction with tele-rehabilitation [16]. In other disabling conditions too such as stroke tele-rehabilitation was used as a promising tool to overcome burdens that restrict the access of stroke survivors to long-term rehabilitative care. Virtual Reality based interventions are game-like and therefore seem to provide a motivational environment which allows longer exercise sessions and greater adherence to therapy [22].

The pandemic has pushed rehabilitation professionals to deliver therapy via tele-practice. In a survey conducted in Finland, 52% of therapists considered using tele-rehabilitation with most of their clients during the first wave of the COVID-19 pandemic, and 46% planned to continue using tele-rehabilitation post-pandemic. Psychotherapists utilized tele-rehabilitation more frequently than other professional groups [10].

Burnout among Rehabilitation Workers

Online rehabilitation intervention also came with emotional costs on part of rehabilitation workers. Online mode of intervention surpasses physical boundaries, timings of availability and personal spaces of therapists.

During the epidemic, a significant number of healthcare professionals experienced signs of professional burnout, with 60% reporting emotional exhaustion. Additionally, 23% showed moderate to severe indicators of depression, 25% exhibited moderate to severe anxiety, and 10% displayed suicidal tendencies. Factors contributing to their emotional distress included negative emotions (such as fear of infection, loneliness, and a sense of isolation), organizational issues (like shortages of personal protective equipment), physical discomfort (due to

inconvenient protective clothing and lack of sleep), and communication difficulties [18].

Burnout is prevalent among healthcare workers caring for COVID-19 patients. Age, gender, job category, and site of practice contribute to the level of burnout that the staff experience [12]. The COVID-19 outbreak had a significant psycho-physical impact on healthcare workers globally. Italian healthcare professionals, in particular, reported experiencing work-related psychological pressure, emotional burnout, and somatic symptoms. Emotional distress is associated with long-lasting effect on professionals' health, including risk of post-traumatic stress disorder [5].

When teachers returned to the classroom for the 2020–2021 school year, they encountered new and challenging environments, instructional methods, and roles as educators. These changes contributed to occupational burnout among them [5].

Methods

Research design

This exploratory study aimed to identify the challenges faced by rehabilitation workers during online interventions with children who have autism spectrum disorder (ASD). Responses of Rehabilitation workers engaged in online intervention of children with ASD were collected using online survey using Google forms. Snowball technique was utilised to collect sample responses. It served purpose of selectively focussing on respondents who are primarily involved in intervention with children with ASD. Intended professionals were approached to share their views and take part in the survey.

Population and sample

The participants for the survey research included special education teachers, student counsellors, psy-

chologists and social workers working at a central government owned special school. Other participants were from integrated schools of Government of Delhi and a prominent Non- Government Organisation.

Sample characteristics

Total of forty-four respondents, who were primarily involved in intervention with children with ASD were surveyed. The group consisted of special education teachers, student counsellors, psychologists, and social workers. Of the respondents, 4.65% were social workers, 74.41% were special educators, 4.65% were rehabilitation psychologists, and 2.32% were psychiatric social workers and 13.95 % of respondents were from other rehabilitation sciences. An online survey form was made using Google form consisting of 15 questions covering awareness on Kiran MHRH, confidence in online intervention, feeling of burden in online intervention, client satisfaction, primary intervention areas choice of technology & methods of change. Google form link was shared with intended responders. Rating scale was used to record responses. Both open and close ended question were employed to seek responses. Whereas closed ended questions were employed to rate different factors associated with online intervention, open ended questions were employed to qualitatively elicit challenges faced by rehabilitation professionals in online interventions.

Results

1.1 Ratings Expressed by Rehabilitation Professionals. Closed ended question were used to get response from rehabilitation professionals. The results are summarised as under.

Table 1

Ratings Expressed by Rehabilitation Professionals

Awareness on Kiran MHRH	Confidence in Online Intervention	Feeling of Burden in Online intervention	Client satisfaction after online intervention	Primary Intervention Areas	Choice of technology & Methods
Very Much (23.25 %)	Very Much (25.58 %)	Very much (2.32 %)	Highly (16.27 %)	Anxiety (4.65 %)	Telephone Call (4.65%)
Highly (13.95 %)	Highly (6.97 %)	Somewhat (58.13 %)	Very Much (53.48 %)	Behaviour Problems (39.53%)	Blended Learning (30.23 %)
Somewha (51.16 %)	Somewhat (46.51 %)	Not burdened (38.55%)	Somewhat (30.23 %)	Activities of Daily Living (41.86%)	Video Call (13.95 %)
No (6.97%)	Can't say (4.65%)			Functional Academics (9.30 %)	Behaviour Modification (4.65 %)
	No (16.27%)			COVID-19 Related (2.32 %)	Parent Training Program (34.88%)
				Any other (2.32 %)	Webinar (6.97%)
					WhatsApp Call (2.32 %)
					Sensory Integration Guidance (2.32 %)

1.2 Perceived challenges in online intervention with children with ASD. Open ended questions were used to get responses on perceived challenges faced by them. Responders were asked to mention biggest challenge faced by them while providing online intervention to children with ASD. Qualitative descriptions written by rehabilitation professionals were recorded and then classified into broad themes.

Discussion

The COVID-19 pandemic has prompted rehabilitation professionals to deliver therapy via online platforms. Similarly, therapists around the world also adopted tele-rehabilitation for the majority of their clients during the first wave of the pandemic [10]. Online rehabilitation intervention has definite advantage of reaching out to many audiences at once.

Mere knowledge of existence of dedicated mental health helpline is likely to augment intervention efforts aimed at betterment of children with ASD. Many rehabilitation workers were found to be not aware of existence of such helpline. After COVID-19 pandemic DEPwD, Ministry of Social Justice & Empowerment Govt. of India had launched Kiran Mental Health and Rehabilitation Helpline (MHRH) to provide psychological and allied intervention free of cost. The Kiran MHRH number, 1800-599-0019, continues to provide callers support for early screening, first-aid, psychological support, distress management, mental well-being, preventing deviant behaviours, psychological crisis management, behaviour modification, positive behaviour support etc. The results of the survey reported that 48.8 percentages of the respondents were somewhat aware of provision of Kiran Mental Health and Rehabilitation Helpline (MHRH). Another 23.3 percentage of respondents were very much aware of services of the helpline. The awareness of Kiran MHRH may ensure

that children with ASD may get quality care through specialised hands.

Online intervention with any treatment group requires certain prerequisites on part of therapists especially information technology skills and telecommunication knowledge. It appears that almost half of rehabilitation professionals had expressed less confidence in online intervention. 46.5 percentages of respondents had somewhat confidence in online intervention for children with ASD. 25.6 percentage of respondents were very much confident in online intervention for children with ASD. A training module on online educational technologies may benefit professionals to manage technology human interface/

Online intervention is perceived as a source of burden by a sizeable portion of rehabilitation professionals. Almost half of the respondents, 55.8 percent, sometimes feel burdened by the online intervention. Online intervention surpasses physical barriers. As a result of online rehabilitation activities, 41.9 percentages of respondents feel occupational burnout whereas an equal percentage of respondents did not feel any burnout presenting a mixed pattern of response. Parents and caregivers of children with autism spectrum disorders administrators might access rehabilitation professionals at all times and this could be the contributing factor towards feeling of burden.

Despite many novel challenges that involves online intervention, rehabilitation professionals left a happy and satisfied client. 55.3 percent of respondents leave a happy and well satisfied child after intervention. Our research findings are in line with previous studies highlighting a high level of satisfaction with tele-rehabilitation [16]. Rehabilitation professionals continue to remain committed to their cause.

Behaviour problems and activity of daily living or self- help skills remained as major focus areas of online intervention. Majority of online intervention has focussed on activities of daily living (41.9%) followed

Table 2

Challenges in Online Interventions. General Themes

S. No	Broad Domains	Number of Reporting	Percentage	Qualitative Reporting
1	Technology	6	13.63 %	The reporting concentrated on individualized interactions with children through computers, self-harming behaviors in children with ASD, online interventions, sensory processing issues, and the difficulty in demonstrating practical elements of training
2	Maladaptive Behaviours	19	43.18 %	Attention, Non-verbal child, Attention of student , Behavioural issues, Retention, Self-injurious behavior, Sensory issues, slow response of student
3	Home environment	5	11.36 %	Home environment, Irregular attendance, Lack of attendance, Irregular attendance, Maintaining scheduling
4	Parental attitude	8	18.18 %	Parental environment, Lack of awareness, Lack of parental cooperation, Parent training, Disability acceptance
5	No issues	6	13.63 %	Achievement, No issues with children
		N = 44		

by behaviour modification (39.5%) and functional academics (9.3%). The major modalities of online intervention with children with ASD were found to be Parent Training Programs and Blended learning adding online and physical modes of intervention. 34.9 percent of respondents chose webinars as preferred mode for communicating with children with ASD followed by blended learning (30.2%) and video call (14 %). Almost 72.1 percent of respondents expressed that if they are given a choice, they would combination of both online and physical mode of intervention while educating Children with Autism Spectrum Disorder. Almost half of the respondents (46.5%) found Google Meet as preferred IT tool. Zoom meetings remained at third spot (23.3%) in delivering intervention to children with autism spectrum disorder.

Behaviour problems namely attention, non-verbal behaviour, memory issues and sensory functions were perceived as most challenging areas of intervention by rehabilitation professionals in online intervention. Parental attitude towards disability viz parent training and disability acceptance too were second most challenging

area of online intervention. Behaviour problems in n and lack of parent training in transfer of training came out to be most prominent problems faced by professionals who are engaged in online intervention for children with ASD. The finding is in line with recommendation for teachers to focus on Social Emotional Learning, Parent Training and field experiences with a mentor [25].

It appears that online interventions have the potential to serve as a broad-based prescription platform and can be an effective method for delivering rehabilitation to patients. During the COVID-19 pandemic, tele-rehabilitation was widely and effectively utilized to minimize disruptions in services. The survey presents a nice insight on various tools behind successful delivery of different educational interventions targeted at children with autism spectrum disorders. However, the broad reasons for such choice still remains open to further investigations.

Conflict of interest

First author worked as first line officer in Kiran Mental Health and Rehabilitation Helpline. There is no conflict of interest between authors. ■■■

References

1. Aishworiya R., Valica T., Hagerman R. et al. An Update on Psychopharmacological Treatment of Autism Spectrum Disorder. *Neurotherapeutics*, 2022, vol. 19, no. 2, pp. 242–262. DOI:10.1007/s13311-022-01183-1
2. Alhuzimi T. Stress and emotional wellbeing of parents due to change in routine for children with Autism Spectrum Disorder (ASD) at home during COVID-19 pandemic in Saudi Arabia. *Research in Developmental Disabilities*, 2021, vol. 108, article no. 103822. 12 p. DOI:10.1016/j.ridd.2020.103822
3. Bahl S., Singh R.P., Javaid M. et al. Telemedicine technologies for confronting COVID-19 pandemic: A review. *Journal of Industrial Integration and Management*, 2020, vol. 5, no. 4, pp. 547–561. DOI:10.1142/S2424862220300057
4. Banerjee D., Bhattacharya P. “Pandemonium of the pandemic”: Impact of COVID-19 in India, focus on mental health. *Psychological Trauma: Theory, Research, Practice, and Policy*, 2020, vol. 12, no. 6, pp. 588–592. DOI:10.1037/tra0000799
5. Barello S., Palamenghi L., Graffigna G. Burnout and somatic symptoms among frontline healthcare professionals at the peak of the Italian COVID-19 pandemic. *Psychiatry Research*, 2020, vol. 290, article no. 113129. 4 p. DOI:10.1016/j.psychres.2020.113129
6. Baweja R., Brown S.L., Edwards E.M. et al. COVID-19 Pandemic and Impact on Patients with Autism Spectrum Disorder. *Journal of Autism and Developmental Disorders*, 2022, vol. 52, no. 1, pp. 473–482. DOI:10.1007/s10803-021-04950-9
7. Fusar-Poli L., Brondino N., Politi P. et al. Missed diagnoses and misdiagnoses of adults with autism spectrum disorder. *European Archives of Psychiatry and Clinical Neuroscience*, 2022, vol. 272, no. 2, pp. 187–198. DOI:10.1007/s00406-020-01189-w
8. Gladfelter A., Barron K.L. How children with autism spectrum disorder, developmental language disorder, and typical language learn to produce global and local semantic features. *Brain Sciences*, 2020, vol. 10, no. 4. 20 p. DOI:10.3390/brainsci10040231
9. Goel I., Sharma S., Kashiramka S. Effects of the COVID-19 pandemic in India: An analysis of policy and technological interventions. *Health Policy and Technology*, 2021, vol. 10, no. 1, pp. 151–164. DOI:10.1016/j.hlpt.2020.12.001
10. Heiskanen T., Rinne H., Miettinen S. et al. Uptake of tele rehabilitation in finland amongst rehabilitation professionals during the COVID 19 pandemic. *International Journal of Environmental Research and Public Health*, 2021, vol. 18, no. 8, article no. 4383. 14 p. DOI:10.3390/ijerph18084383
11. Iqbal N., Dar K.A. Coronavirus disease (COVID-19) pandemic: Furnishing experiences from India. *Psychological Trauma: Theory, Research, Practice, and Policy*, 2020, vol. 12, no. S1, pp. S33–S34. DOI:10.1037/tra0000770
12. Jalili M., Niroomand M., Hadavand F. et al. Burnout among healthcare professionals during COVID-19 pandemic: a cross-sectional study. *International Archives of Occupational and Environmental Health*, 2021, vol. 94, no. 6, pp. 1345–1352. DOI:10.1007/s00420-021-01695-x
13. Jena P.K. Impact of Pandemic COVID-19 on Education in India. *International Journal of Current Research*, 2020, vol. 12, no. 7, pp. 12582–12586.
14. Jude H.D., Balas V.E. Telemedicine technologies: Big data, deep learning, robotics, mobile and remote applications for global healthcare. Cambridge: Publ. Academic Press, 2019. 260 p. ISBN 978-0-12-816948-3.

15. Kene P. Mental health implications of the COVID-19 pandemic in India. *Psychological Trauma: Theory, Research, Practice, and Policy*, 2020, vol. 12, no. 6, pp. 585–587. DOI:10.1037/tra0000750
16. Ku B.P.S., Tse A.W.S., Pang B.C.H. et al. Tele-rehabilitation to combat rehabilitation service disruption during COVID-19 in Hong Kong: Observational study. *JMIR Rehabilitation and Assistive Technologies*, 2021, vol. 8, no. 3, article no. e19946. 16 p. DOI:10.2196/19946
17. Manning J., Billian J., Matson J. et al. Perceptions of Families of Individuals with Autism Spectrum Disorder during the COVID-19 Crisis. *Journal of Autism and Developmental Disorders*, 2021, vol. 51, no. 8, pp. 2920–2928. DOI:10.1007/s10803-020-04760-5
18. Petrikov S.S., Kholmogorova A.B., Suroegina A.Y.U. et al. Professional Burnout, Symptoms of Emotional Disorders and Distress among Healthcare Professionals during the COVID-19 Epidemic. *Counseling Psychology and Psychotherapy*, 2020, vol. 28, no. 2, pp. 8–45. DOI:10.17759/PPP.2020280202
19. Pfeiffer B., Brusilovskiy E., Hallock T. et al. Impact of COVID-19 on Community Participation and Mobility in Young Adults with Autism Spectrum Disorders. *Journal of Autism and Developmental Disorders*, 2022, vol. 52, no. 4, pp. 1553–1567. DOI:10.1007/s10803-021-05054-0
20. Prizant B.M., Wetherby A.M., Rubin E. et al. The SCERTS Model: A Transactional, Family-Centered Approach to Enhancing Communication and Socioemotional Abilities of Children With Autism Spectrum Disorder. *Infants & Young Children*, 2003, vol. 16, no. 4, pp. 296–316. DOI:10.1097/00001163-200310000-00004
21. Salawu A., Green A., Crooks M.G. A proposal for multidisciplinary tele-rehabilitation in the assessment and rehabilitation of COVID-19 survivors. *International Journal of Environmental Research and Public Health*, 2020, vol. 17, no. 13, article no. 4890. 13 p. DOI:10.3390/ijerph17134890
22. Schröder J., van Crielinge T., Embrechts E. et al. Combining the benefits of tele-rehabilitation and virtual reality-based balance training: a systematic review on feasibility and effectiveness. *Disability and Rehabilitation: Assistive Technology*, 2019, vol. 14, no. 1, pp. 2–11. DOI:10.1080/17483107.2018.1503738
23. Sharma S., Basu S., Shetti N.P. et al. Current treatment protocol for COVID-19 in India. *Sensors International*, 2020, vol. 1, article no. 100013. 3 p. DOI:10.1016/j.sintl.2020.100013
24. Shaughnessy M.F. An Interview with Ajay Singh: The Ages and Stages Questionnaire (ASQ). *Education, Society and Human Studies*, 2020, vol. 1, no. 1, pp. 6–11. DOI:10.22158/eshs.v1n1p6
25. Singh A., Yeh C.J., Boone Blanchard S. Ages and Stages Questionnaire: a global screening scale. *Boletín Médicodel Hospital Infantil de México*, 2017, vol. 74, no.1, pp. 5–12. DOI:10.1016/j.bmhmx.2016.07.008
26. Singh U., Rawat K., Singhla A.R. Dynamics of e-Governance in post COVID era: India. *Electronic Journal of Information Systems in Developing Countries*, 2021, vol. 87, no. 4, article no. e12168. 16 p. DOI:10.1002/isd.12168
27. Soni P. Effects of COVID-19 lockdown phases in India: an atmospheric perspective. *Environment, Development and Sustainability*, 2021, vol. 23, no. 8, pp. 12044–12055. DOI:10.1007/s10668-020-01156-4
28. Sridhar K.S. Urbanization and COVID-19 Prevalence in India. *Regional Science Policy and Practice*, 2021, vol. 15, no. 3, pp. 493–506. DOI:10.1111/rsp.12503
29. Syriopoulou-Delli C.K., Gkiolnta E. Review of assistive technology in the training of children with autism spectrum disorders. *International Journal of Developmental Disabilities*, 2022, vol. 68, no. 2, pp. 73–85. DOI:10.1080/20473869.2019.1706333

Information about the authors

Dattatreya Rai, Vocational Counsellor, Rehabilitation Professor, Department of Rheumatology, All India Institute of Medical Sciences, New-Delhi, India, ORCID: <https://orcid.org/0000-0002-8975-2609>, e-mail: dattatreyai@yahoo.co.in

Jayanti Pujari, PhD. Professor, Department of Rehabilitation Sciences, Amity University, Noida, India, ORCID: <https://orcid.org/0000-0003-1414-5764>, e-mail: jpujari@amity.edu

Информация об авторах

Рай Даттатрея, консультант, профессор реабилитации, отделение ревматологии, **Всеиндийский институт** медицинских наук, г. Нью-Дели, Индия, ORCID: <https://orcid.org/0000-0002-8975-2609>, e-mail: dattatreyai@yahoo.co.in

Пуджари Джаянти, PhD, профессор Департамента реабилитационных наук, Университет Амити, г. Нойда, Индия, ORCID: <https://orcid.org/0000-0003-1414-5764>, e-mail: jpujari@amity.edu

Получена 24.07.2024

Received 24.07.2024

Принята в печать 17.12.2024

Accepted 17.12.2024