



Original Article

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Impact of COVID-19 Pandemic on People With Locomotor Disability in North India: A Cross-Sectional Analysis

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Objective: To assess, analyse, and infer the impact of the coronavirus disease 2019 (COVID-19) pandemic on people living with locomotor disability in North India.

Methods: Patients with locomotor disabilities who met the inclusion criteria received a questionnaire that had already undergone testing and validation. It covered topics highlighting the effect of the pandemic on general health, financial burden, psychological and mental health, social life and behaviour, disability and comorbidity management, transportation, and healthcare accessibility during the pandemic. In order to gauge the pandemic's effects on the population of people with locomotor disabilities, the answers to the questions were collected and analyzed.

Results: The COVID-19 pandemic has adversely affected people living with locomotor disability, ranging from loss of wages and financial crisis to anxiety, depression and lack of sleep. People with disabilities had limited reach to health and community services that were vital for them, including basic life and functional needs, besides risks of mistreatment and other psychological consequences.

Conclusion: This analysis suggests that the root cause of pandemic disparities is the lack of disability-inclusive planning and, more significantly, the pre-existing socioeconomic disparities and challenges that disabled people have been experiencing for a long time. We suggest that unambiguous public health and policy responses should be incorporated, and health, social participation, and socioeconomic disparity causes for disabled people should be addressed in tandem.

Keywords: COVID-19, Disabled persons, Rehabilitation, Quality of life

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INTRODUCTION

In March 2020, the World Health Organization (WHO) declared the outbreak of a novel coronavirus disease, coronavirus disease 2019 (COVID-19), to be a pandemic. More than 200 countries

across the world have been affected in due course. According to the WHO, the definition of “disability” is quoted as, “Disability is an umbrella term, covering impairments, activity limitations, and participation restrictions. An impairment is a problem in body function or structure; an activity limitation is a difficulty

encountered by an individual in executing a task or action; while a participation restriction is a problem experienced by an individual in involvement in life situations” [1]. As per WHO, around 16% of the total population, that is, 1.3 billion people, are currently living with a disability [2]. Specifically, around 80% of these can be traced to middle to low-income countries [3]. While the pandemic has affected people globally, disrupting routine healthcare services, it has disproportionately affected specific populations, like patients who have terminal illnesses, victims of trauma, emergency medical and surgical care services and those with disabilities [4]. Persons with disability (PWD), in particular, those living in developing nations like India, were more at risk of the deleterious impact of the COVID-19 pandemic as these countries have limited resources to counteract the effect of the pandemic [5]. According to a WHO survey, more than half of PWDs are not able to meet the expense of health services as compared to those without disability [6]. This gap further widened during the COVID-19 pandemic as the world tried newer models of patient treatments, such as using a digital platform and telemedicine as alternatives to conventional models.

The promoted methods to contain the spread of COVID-19, like social distancing, self-isolation, repeated washing of hands, and sanitization practices, were not effortless for PWDs. Besides, it has been seen that PWDs are more likely to be living with comorbidities like cardiac and diabetes, making them vulnerable to coronavirus [7]. They also suffer from the fear of economic instability, social insecurity, and social isolation, which could worsen the physical and psychological well-being of PWDs.

In this paper, we have collected and analyzed data through in-depth telephonic interviews and self-administered questionnaires related to the effect of the pandemic on different aspects of life in PWD during the pandemic. The study also demonstrates some of the coping mechanisms used by PWDs during the pandemic, highlighting both issue and intervention opportunities for those participating in the pandemic response. The present study aimed to assess, analyse and infer the impact of the COVID-19 pandemic on PWDs.

METHODS

The present study was a prospective cross-sectional observational design. This multicentric study was conducted at two Level III COVID-19 health care centres in North India from

January 2021 to July 2022. Patients who satisfied the inclusion criteria and agreed to participate in the study after giving verbal consent were included. Due clearance was obtained from the Ethical committees of the SGPGI Ethic Cell and VMMC Ethic Cell (IEC code: 2021-72-IP-EXP-36 and IEC-6/2020). Patients were contacted on their telephone and explained about the study and took consent. Later, they were sent the questions in Google form on WhatsApp (Meta Platforms, Inc.), and their responses were noted. Those who were unable to fill out the Google form were interviewed telephonically. The responses were analyzed to measure the impact of the pandemic on all the above-given parameters, including socioeconomic and demographic parameters.

Study population

PWDs already enrolled and under treatment at the two study centres were contacted for participation in the study. Those aged between 18 and 65 years and with any type of locomotor disability, including long-term neurological conditions, multiple disabilities, and leprosy, were included in the study. PWDs with low intellect, inability to read or hear, unwillingness to participate in the study, and inability to comprehend Hindi and English were excluded.

Questionnaire designing

Together with a team of four physiatrists, a psychiatrist and a statistician, a questionnaire was created that addressed several topics, including how the pandemic affected people’s general health, financial burden, psychological and mental health, social life and behaviour, managing their disability and comorbidities, and accessibility to transportation and medical care. These experts were asked to grade the overall questionnaires on a 5-point scale of relevance, clarity, simplicity and free of ambiguity. The obtained responses were entered into Microsoft Excel (Microsoft Corp.), and the statistical measures for the external validation of the questionnaire were calculated. From the obtained responses (scores between 1 to 5, where a higher score indicates the goodness of the questionnaires), it was seen that relevance was 93.3%, clarity was 96.7%, and simplicity was 90%, whereas free of ambiguity was 86.7%. The overall agreement among the experts was 91.7%. The questionnaire is added as a [Supplementary Material](#) in the end.

Further, the same questionnaires were used for pilot testing on 20 patients at one of the two study centres. The collected data were entered in Microsoft Excel and analyzed. Based on

the pilot data, Cronbach's alpha, a measure of internal consistency, also called a measure of scale reliability, was calculated. Cronbach alpha was 82.5%, which showed good reliability or internal consistency among the scales.

Sample size estimation

This was an exploratory study, and the prevalence of the disabled population affected by the COVID-19 pandemic was unknown. To get the maximum sample size, we assumed that the pandemic impacted at least 50% of people with disabilities. At a minimum, with a two-sided 95% confidence interval and 15% as a relative error in the assumed prevalence, the sample size was calculated to be 178. The sample size was estimated using PASS 16 (NCSS).

Statistical analysis

Questionnaire responses related to impacts were converted into ordinal scales. Categorical variables were expressed as percentages. Continuous variables were expressed as mean±standard deviation. The association of the impact of COVID-19 on domestic violence was evaluated before and during the COVID-19 pandemic using the McNemar test. Data was analyzed using IBM SPSS Statistics 23 (IBM Corp.).

RESULTS

A total of 450 PWDs under follow-up at 2 study centres were contacted telephonically during the study period. All were delivered validated electronic questionnaires in Google forms through social messaging platforms. Initially, 186 PWDs submitted complete and required details. Another 14 willing PWDs were interviewed telephonically. Therefore, we had 200 PWDs, all with locomotor disabilities, with equal numbers from both the study centres. Most of the patients were young males and belonged to the age group 17–30 years (42.5%). Around 84% of the study population was literate (Table 1). It was alarming to note that approximately 65.5% of the study population was unemployed and entirely financially dependent on others, whereas 8% of the PWDs claimed to be partially dependent on others to meet their financial needs.

Furthermore, this highlights the fact that despite being literate, a significant portion of the population of people with disabilities was unemployed. The mean duration of disability was 8.64±10.21 years. The mean disability percentage calculated according to the Government of India gazette was 58.13±14.53.

COVID appropriate behaviour

All patients said they were aware of the current pandemic and could access the information regarding prevention and precautions advised to prevent COVID-19 infection through digital and print media. Around 36.0% faced difficulty wearing a mask, 12.0% faced difficulty in regular hand washing, and 34.0% faced difficulty accessing a hand sanitiser (Table 2). Maintaining social distancing took much work for 44.0% of respondents.

Financial stress during pandemic

Forty percent of the patients agreed that the pandemic had increased their dependency on others. Around 73% of employed respondents said they faced decreased wages during the pandemic. Consequently, around 37% of the patients struggled to get a balanced and nutritious diet during the same period. However, 27.5% of the disabled population reported an increase

Table 1. Socio-demographic profile of the study subjects

	Value (n=200)
Age (yr)	
17–30	85 (42.5)
31–40	33 (16.5)
41–50	46 (23.0)
51–60	27 (13.5)
61–70	9 (4.5)
Sex	
Female	64 (32.0)
Male	136 (68.0)
Literacy status	
Illiterate	32 (16.0)
High school	87 (43.5)
Senior secondary	46 (23.0)
Graduate	23 (11.5)
Post-graduate or above	12 (6.0)
Occupation	
Unemployed	131 (65.5)
Self-earning	17 (8.5)
Housewife	3 (1.5)
Job	49 (24.5)

Values are presented as number (%).

Table 2. Distribution of study subjects according to their ability to practice appropriate behaviour related to COVID-19 (n=200)

COVID appropriate behaviour follow	Yes	No
Wear a mask	128 (64.0)	72 (36.0)
Wash hands	176 (88.0)	24 (12.0)
Use sanitiser	132 (66.0)	68 (34.0)
Social distancing	112 (56.0)	88 (44.0)

Values are presented as number (%).
COVID-19, coronavirus disease 2019.

in weight during this period, and 18% had a decrease in weight. 28% of the population felt a worsening in the general health conditions during the pandemic compared to before.

Psychological and social issues during pandemic

During the period, 43% of the PWD felt anxious, while before the pandemic, only 21% had any form of anxiety in their daily life. Approximately 59.5% of the PWD felt more isolated as compared to before. Around 55% of the study group felt depressed, and 40% faced difficulty in sleeping during the pandemic. Nearly 44% of respondents said they had decreased interest in leisure activities. Around 27.5% of the respondents had faced domestic violence in some form during the pandemic, whereas before it was faced by 11.5% of the respondents (Table 3).

Public transport, health care service and telemedicine accessibility

A total of 58% of the respondents had difficulty accessing public transport. Nearly 32% felt that the pandemic had worsened their comorbidities, 22% felt it was more costly to get treatment, and 39% found it challenging to manage their comorbidities. Overall, 28% felt worsening general health conditions compared to pre-COVID levels. Although many hospitals, including centres of the study, had started facilities for telemedicine, including tele-rehabilitation, during the pandemic, only 24.5% were aware of it. Of those who availed of the facility, 95.9% were satisfied with the system, 81.6% preferred tele-rehabilitation over conventional treatment, and felt it was cheap. Two percent of patients faced difficulty accessing tele-rehabilitation (Table 4).

DISCUSSION

The 2011 Census shows 26.8 million PWD live in India [7]. They comprise one of the largest marginalised groups in India. India's population of PWD has marginally increased over the past ten years, going from 21.9 million in 2001 to 26.8 million [8].

Through the establishment of secure lockdown and social segregation measures, some of which are still in effect today, the

epidemic altered the social landscape around the world. People with disabilities were at a higher risk of suffering from the pandemic due to both direct health effects and consequences of the pandemic response [9]. Factors associated with disability, like older age, underlying comorbidities, poverty and rural living, made this group more vulnerable to adverse health outcomes [10]. Furthermore, the pandemic hurt people with disabilities who needed personal care assistance with daily activities or routine medical treatment, especially for diseases and needs that approaches could not successfully treat like telemedicine [11,12].

Data from 200 PWD, primarily young males, revealed that 65.5% were unemployed, and 73% were financially dependent on their caregivers. Therefore, if earning family members lost their jobs or could not go to work, it adversely affected the dependent members of the family. This made them more vulnerable to the financial crisis during the pandemic time. Around 40% of respondents felt that the pandemic had increased their dependency on others.

The results from a previous work suggest that working-age PWDs were particularly affected financially by the lockdown

Table 4. Tele-rehabilitation responses from the study population

	Yes	No
Awareness of tele-rehabilitation services (n=200)	49 (24.5)	151 (75.5)
Satisfaction with the management offered (n=49)	47 (95.9)	2 (4.1)
	Value (n=49)	
Preference for tele-rehabilitation or conventional rehabilitation		
Tele-rehabilitation is more convenient	40 (81.6)	
Conventional rehabilitation is more convenient	9 (18.4)	
Difficulties encountered while accessing tele-rehabilitation services		
No issues	47 (96.0)	
Lack of device	1 (2.0)	
Unable to understand	1 (2.0)	
Cost preference for tele-rehabilitation services over conventional treatment		
Yes	45 (91.8)	
No	2 (4.1)	
Both are same	2 (4.1)	

Values are presented as number (%).

Table 3. Frequency of domestic violence during and before the pandemic (n=200)

Frequency	Domestic violence during the pandemic	Domestic violence before the pandemic	p-value
Never	145 (72.5)	177 (88.5)	<0.001
Sometimes	28 (14.0)	17 (8.5)	0.082
Fairly often	27 (13.5)	6 (3.0)	<0.001

Values are presented as number (%).

McNemar test: p<0.0001.

[13]. According to another study, people with disabilities were disproportionately impacted by lockdown-related efforts to contain the COVID-19 pandemic in terms of their socioeconomic status, health, educational opportunities, social support, and engagement in society [14]. Disabled people often have a small social circle, became more socially isolated due to the pandemic, and found it challenging to access crucial communications during emergencies, such as those relating to transport and public health [14]. Our study also inferred similar results concerning social isolation and means of transportation.

According to results from an additional study, the pandemic made it difficult for PWDs to get transport and other essential goods and services [15]. Fifty-eight percent of the respondents said that using public transport during the pandemic was difficult due to social distancing behaviour. As a result, it became challenging to obtain healthcare services. According to one study, individuals with disabilities face more difficulties and concerns during the COVID-19 pandemic, increasing their risk of experiencing stress and trauma from the disease itself as well as the pandemic's social repercussions [7]. Due to the pandemic, many persons with impairments lost their occupations, which left them in financial hardships. Since small businesses and non-profit organisations were mainly closed during the lockdown, their employees with disabilities lost their jobs [16]. People with disabilities in lower-middle-income countries frequently labour in the informal sector, particularly women, and suffer food insecurity as well as the lack of sick leave and unemployment benefits [17]. In developing countries like ours, a large proportion of people with disabilities live in single-income households; therefore, COVID-related unemployment provides economic hardship. In our study, around 73% of employed respondents said they faced decreased wages during the pandemic. It was primarily due to job loss, job change, decreased work and demand for their service. This added to their financial burden. Consequently, around 37% of the patients struggled to get a balanced and nutritious diet during the same period.

Anxiety, melancholy, malnutrition, dementia, and cognitive decline are all established risk factors for health-related effects and have been linked to social isolation and loneliness in older persons [18,19]. Disruptions to routines, activities, and support networks and loss of financial support can have various psychological effects on people with disabilities, making them particularly vulnerable to these effects. In addition, there is perpetual stress and worry due to the worry of contracting COVID-19 infection or from a general ignorance about the pandemic

and its restrictions. The pandemic led to social isolation and a depressed environment. People lost their loved ones and saw sickness all around. Forty-three percent felt anxious during this period, and 59.5% felt more isolated than before. Nearly 44% said they had decreased interest in doing leisure activities, 55% of the study population felt depressed, and around 40% faced difficulty sleeping. A study demonstrated how increases in anxiety, stress, and despair are associated with financial hardship brought on by COVID-19 and increased social isolation as a result of observing protective measures, highlighting mental health struggles among people with disabilities and chronic health conditions [20]. Studies have shown that isolation can cause disabled people to become anxious, angry, stressed, and agitated [21], and consequent increased risk for suicidal behaviours [22]. During the pandemic, it was also found that there was an increase in stress and burden of care for family members and caregivers. We also found a 16% increase in the incidence of domestic violence against PWD during the pandemic. A survey-based study found that 86.3% of respondents had reservations about the COVID-19 pandemic's impact on their lives and that 44% of participants claimed the COVID-19 pandemic had presented them with new health concerns [12].

Additionally, in another online survey on how the pandemic was affecting the lives of people with disabilities, three-quarters of respondents said that the pandemic had negatively impacted their health in some way, with problems like limited access to healthcare facilities and secondary deterioration in comorbidities [23]. In addition to obstructing access to treatment for acute and chronic medical conditions, it was found in a study that the pandemic also disrupted the approach to preventative health care and screenings, such as cancer screenings, theoretically leading to later cancer diagnosis and increased mortality [24]. Additionally, disabled people also earned lower wages and had to face financial crises during the pandemic. In India, those without proper documentation, including refugees and migrants with disabilities, have more difficulty gaining healthcare owing to lockdown restrictions [25]. Our study found that 28% of the respondents complained of a worse general health condition than before.

Unfortunately, it was often seen that many people with disabilities had certain primary or secondary health conditions, such as cardiovascular disease and pulmonary disease. In our study, around 39% found it challenging to manage comorbidities during this period, and 32% felt it was more costly to get treated for their existing comorbidities. They experienced

chronic stress and moderated access to resources during the pandemic. For example, for people with lower socioeconomic standing, meal delivery services were not easily accessible or affordable, and the congested living circumstances that are a fact of life in many low-income housing complexes made social isolation even more challenging [26].

During the pandemic, many essential healthcare services for individuals with disabilities, such as outpatient care, daycare, and some in-patient services, were either shut down or maintained at a reduced capacity as a result of the lockdown. Due to a lack of transportation during lockdowns, people with disabilities had limited access to in-person healthcare treatments [27,28]. This reduction in physical inactivity leads to deconditioning and new disability risks and exacerbates existing ones [16,29]. In our study, 27.5% had found an increase in weight due to less physical activity. Besides, 18.5% had an overall reduction in weight, which could be attributed to financial stress and lack of nutritious diet by 15% of the study group.

Disabled people are frequently excluded from discussions concerning social policy, especially issues regarding disability [30]. This becomes more important during difficult times like a pandemic when the marginalised and vulnerable populations are, more often than not, disregarded and given less priority. Therefore, it is not surprising that the disabled community has experienced intense worries and concerns as a result of this pandemic.

To the best of our knowledge, this is the first study conducted in India that uses a validated questionnaire created by subject-matter experts to highlight the impact of a pandemic on people with disabilities. The study includes a sizable sample size from two distinct northern Indian regions. The study's findings will aid in improving plans for PWD in the event of a pandemic of this size in the future. The study draws attention to some PWD-related issues that were previously overlooked, such as financial strain during pandemics, domestic abuse, and accessibility to healthcare services. However, our sample population does not represent the country as a whole. We could not evaluate issues unique to PWDs from rural backgrounds since we could not include them. Furthermore, persons with disabilities other than locomotor disabilities have not been included. Future reviews must take into account and evaluate the impacts faced by individuals with other forms of disabilities, too, given that they are a population that is particularly susceptible to adverse consequences amidst this crisis.

In conclusion, the study examined a wide variety of inter-

connected socioeconomic and health inequities that affected people with disabilities for three years during the COVID-19 pandemic in India. People with disabilities had limited access to health and community services that were necessary for them, including addressing basic functional and life needs in addition to the dangers of maltreatment and psychological effects. Their families and caregivers also experienced an inconsistent burden and stress. According to this analysis, all of these pandemic disparities result from a lack of disability-inclusive preparedness and responses and, more importantly, from long-standing socioeconomic disparities that affect persons with disabilities. We propose that precise public health and policy interventions are required to prevent or minimise them. These must simultaneously address socioeconomic inequality, social involvement, and health.

CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

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AUTHOR CONTRIBUTION

Conceptualization: Rai S, Uppal H, Gunjiganvi M. Methodology: Rai S, Uppal H, Gunjiganvi M. Formal analysis: Rai S, Uppal H, Mishra P. Project administration: Rai S, Uppal H, Gunjiganvi M, Joshi N. Writing – original draft: Uppal H, Mishra P, Joshi N. Writing – review and editing: Rai S, Uppal H, Gunjiganvi M. Approval of final manuscript: all authors.

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SUPPLEMENTARY MATERIALS

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