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## Review Article

## Impact of COVID-19 on people with physical disabilities: A rapid review

Audrey Lebrasseur<sup>a, b</sup>, Noémie Fortin-Bédard<sup>a, c</sup>, Josiane Lettre<sup>a</sup>, Eve-Line Bussièrès<sup>a, d</sup>, Krista Best<sup>a, b</sup>, Normand Boucher<sup>a, c</sup>, Mathieu Hotton<sup>a, b</sup>, Simon Beaulieu-Bonneau<sup>a, e</sup>, Catherine Mercier<sup>a, b</sup>, Marie-Eve Lamontagne<sup>a, b</sup>, François Routhier<sup>a, b, \*</sup>

<sup>a</sup> Centre for Interdisciplinary Research in Rehabilitation and Social Integration, Centre Intégré Universitaire de Santé et de Services Sociaux de La Capitale-Nationale, Quebec City, QC, Canada

<sup>b</sup> Department of Rehabilitation, Université Laval, Quebec City, QC, Canada

<sup>c</sup> School of Social Work and Criminology, Université Laval, Quebec City, QC, Canada

<sup>d</sup> Departement of Psychology, Université Du Québec à Trois-Rivières, Trois-Rivières, QC, Canada

<sup>e</sup> School of Psychology, Université Laval, Quebec City, QC, Canada

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## ABSTRACT

**Background:** The COVID-19 pandemic caused drastic changes in the lives of the general population. People with physical disabilities, who commonly encounter daily challenges such as barriers to community mobility, reduced access to healthcare services and higher risk of suffering from depression, may face additional challenges in the context of the pandemic.

**Objective:** This study aims to review the impact of the COVID-19 pandemic, and associated isolation and protective measures, among people with physical disabilities.

**Methods:** A rapid review of the published literature was conducted on August 10, 2020 through a search in six online databases to synthesize results from original studies regarding the impact of the COVID-19 pandemic on people with physical disabilities. The International Classification of Functioning, Disability and Health was used to describe the population and the personal and environmental factors with a unified and standard health language.

**Results:** Eleven records were extracted from 1621 individual papers retrieved from the search strategy. Various impacts on daily functioning such as a decrease in access to healthcare have been noted during the pandemic. Changes in social and lifestyle habits, mood changes and decreased levels of physical activity were also noted.

**Conclusions:** Our results highlighted the lack of early research about the impacts of COVID-19 experienced by people with physical disabilities. Future studies should focus on specific consequences and needs of this vulnerable population to ensure their inclusion in public health recommendations and consideration by policy makers.

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## Background

A global pandemic was declared due to the novel SARS-CoV-2 (COVID-19) at the end of 2019, which resulted in more than 22 million cases by August 20, 2020.<sup>1</sup> The ongoing COVID-19 pandemic and associated isolation and protective measures are leading to

drastic changes in the lives of the general population.<sup>2</sup> In addition to the possibility of having COVID-19 and its health-related complications, the general population is experiencing major consequences in their daily lives, such as high stress exposure,<sup>3</sup> low mood,<sup>4</sup> disturbed sleeping patterns<sup>5</sup> and financial worry and depression.<sup>6</sup> Projections show that increased suicide rates may result from this pandemic.<sup>7</sup> In sum, COVID-19 has resulted in tremendous impact among the non-disabled population.

Individuals living with disabilities, who represent 15% of the global population,<sup>8</sup> commonly encounter challenges while carrying out their daily life activities, without the COVID-19 context, such as

\* Corresponding author. Centre interdisciplinaire de recherche en réadaptation et intégration sociale CIUSSS de la Capitale-Nationale 525 Hamel est, Québec, G1M 2S8, Canada.

E-mail address: [Francois.Routhier@rea.ulaval.ca](mailto:Francois.Routhier@rea.ulaval.ca) (F. Routhier).

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barriers to community mobility,<sup>9</sup> difficulties accessing public transportation,<sup>10</sup> reduced access to healthcare services<sup>11</sup> and barriers to communication.<sup>12</sup> Compared to the general population, individuals with disabilities have a higher risk of depression,<sup>11</sup> lower life satisfaction<sup>13</sup> and increased loneliness.<sup>14</sup> Considering the COVID-19 pandemic, the World Health Organization (WHO) stated that additional considerations from governments, healthcare systems, disability service providers, institutional settings, communities and actors are needed for people with disabilities.<sup>15</sup> A global pandemic has the potential to significantly increase the daily challenges of people with disabilities and may have a greater impact compared to the general population.<sup>15</sup> Indeed, people with disabilities are often directly impacted by deficiencies and gaps in the healthcare system.<sup>8</sup> They may have a higher risk of contracting COVID-19 and increased complications associated with additional barriers to respect social distancing measures. For example, people with disabilities may rely on public and adapted transportation, have regular healthcare or rehabilitation appointments, need close contact from caregivers or health professionals to achieve their daily routine, or have reduced ability to communicate with face masks (both speaking and hearing others). People with disabilities were already considered a marginalized group<sup>16</sup> and reduced access to healthcare and community support services, among other restrictions, could amplify their daily difficulties. Given their dependence on services and others to meet specific needs<sup>16</sup> and their increased susceptibility to COVID-19, people with disabilities are considered vulnerable in this crisis.

It is crucial that governments, healthcare providers and the general population understand the reality of people with disabilities to support their needs with adequate policies, such as ensuring the continuity of necessary community-based social services, providing access to important information and developing adapted guidelines.<sup>17</sup> A review of the impact of the COVID-19 pandemic on people with disabilities is therefore urgent to minimize long-term consequences and optimize their quality of life and social participation in respect to the Convention of the rights of persons with disabilities.<sup>18</sup> The COVID-19 pandemic has impacted and continues to change the daily life of the entire population. This rapid review focusses on changes regarding areas of functioning, health conditions and contextual factors and possible additional burden experienced by people with physical disabilities, defined as people with an impairment of sensory functions and pain, voice and speech functions, or neuromusculoskeletal and movement-related functions.

## Objective

The goal of this knowledge synthesis is to review the impact of the COVID-19 pandemic, and associated isolation and protective measures, on people with physical disabilities.

## Methods

Given the need for rapid answers to support decision making of various stakeholders and public policies, a rapid review was conducted. A rapid review is a knowledge synthesis that uses an accelerated systematic review method, represented by limiting certain aspects of the methodology in order to provide evidence in a policymaker's timeframe.<sup>19,20</sup> The methodology of this rapid review follows the Cochrane Rapid Reviews' guide<sup>20</sup> and the Practical guide for rapid reviews to strengthen health policy and systems.<sup>21</sup> Our methods and results are reported following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Statement.<sup>22</sup> To address the methodological challenges encountered in the conduct of rapid reviews during COVID-19,

suggestions and the eight-step knowledge synthesis proposed by Tricco et al. were followed.<sup>23</sup> The protocol for this rapid review was registered with the PROSPERO database (ID: CRD42020196330). To meet the collaborative recommendations for the inclusion of key stakeholders in rapid reviews, the authors comprised interdisciplinary and intersectoral rehabilitation researchers within a regional health authority.<sup>21</sup>

## Conceptual framework

The International Classification of Functioning, Disability and Health (ICF) was used to identify key terms and construct a search strategy with a unified and standard health language.<sup>24</sup> The level of functioning is defined by the ICF as a dynamic interaction between the health conditions of an individual and his contextual factors (personal and environmental). The term disability is used to define impairments, activity limitations and participation restrictions, which result from a non-optimal interaction between the health conditions, environmental factors, and personal factors. A disability is therefore characterized by difficulties encountered in the following areas of functioning: participation, activities, and body functions and structures. The ICF framework provides a biopsychosocial model of disability, allowing the classification of human level of functioning and the identification of related physiological functions, anatomical structures, actions, tasks, areas of life, and external influences.<sup>25</sup> For this review, the population was narrowed to people with physical disabilities.

## Literature search

Search strategies were developed by two authors and reviewed by three others. The search was developed around three main concepts, which were "COVID-19", "people with physical disabilities" and "impact". Associated key words were selected in coherence with those concepts. The category "COVID-19" was used to limit the results to those related to this pandemic. The category "people with physical disabilities" includes general terms for people of all ages with disabilities and specific diagnosis in coherence with the eligibility criteria. The category "impact" regroups the ICF areas of functioning, health conditions and contextual factors that could be associated with the COVID-19 pandemic and includes elements such as the psychosocial, emotional, environmental, physical and psychological impacts. They can be reported by the person, caregivers, family or healthcare workers, regarding how the impacts are experienced or perceived. If applicable, changes in those outcomes since the beginning of the pandemic were also assessed. Searched databases were MEDLINE via PUBMED, Embase, PsycINFO and PsycARTICLES via Psycnet, and CINAHL and Ageline via EBS-COhost. The searches were conducted on August 10, 2020. See [Appendix 1](#) for detailed search strategies used in each database.

## Eligibility criteria

The Population, Exposure, Comparator, and Outcomes (PECO) framework was used to develop the eligibility criteria (see [Table 1](#)).<sup>26</sup> Physical disabilities, defined with the ICF,<sup>24</sup> included impairments of sensory functions and pain, voice and speech functions, or neuromusculoskeletal and movement-related functions; or of the structures of the nervous system, the eye, ear and related structures, the structures involved in voice and speech, or the structures related to movement. Studies focussing on patients with chronic conditions such as diabetes and hypertension only or with unspecified chronic conditions that cannot ensure a specific diagnosis in the methodology or analysis were excluded.

Only original studies with data related to our research question

**Table 1**  
PECO Inclusion Criteria defined with the ICF.

<b>Population (P)</b>	People with physical disabilities, defined with an impairment of sensory functions and pain, voice and speech functions, or neuromusculoskeletal and movement-related functions; or of the structures of the nervous system, the eye, ear and related structures, the structures involved in voice and speech, or the structures related to movement.
<b>Exposition (E)</b>	COVID-19 and associated isolation and protective measures
<b>Comparator (C)</b>	General population, other populations or none
<b>Outcomes (O)</b>	Changes in body functions or structures, limitations, restrictions, capacity or performance regarding the component activities and participation, or facilitators or barriers from environmental factors.

were included, thus excluding opinion papers, reviews and methodological articles and unpublished documents. Publication dates were limited to 2019 and 2020, as the COVID-19 pandemic started in 2019. Papers had to be available in English or French for the full text review.

#### Study selection and data extraction

Data retrieved from the databases were exported to Endnote, and then to Covidence. They were both used to identify duplicates in obtained records. Two reviewers independently screened the titles and abstracts of the obtained records using the Covidence platform, and decisions were recorded using the same platform. The same two reviewers read the full text of the selected papers. When the reviewers disagreed on the inclusion of an article, they consulted with one another to reach consensus, for both the screening and full text phases. The extraction process was done by one reviewer and verified by the other. The extracted data were the title, year, authors, country, study design, objective, participants characteristics (e.g., diagnosis, N), outcomes (before and after the COVID-19 pandemic, if applicable), and funding sources. The references of the included studies (11 final papers) were screened by

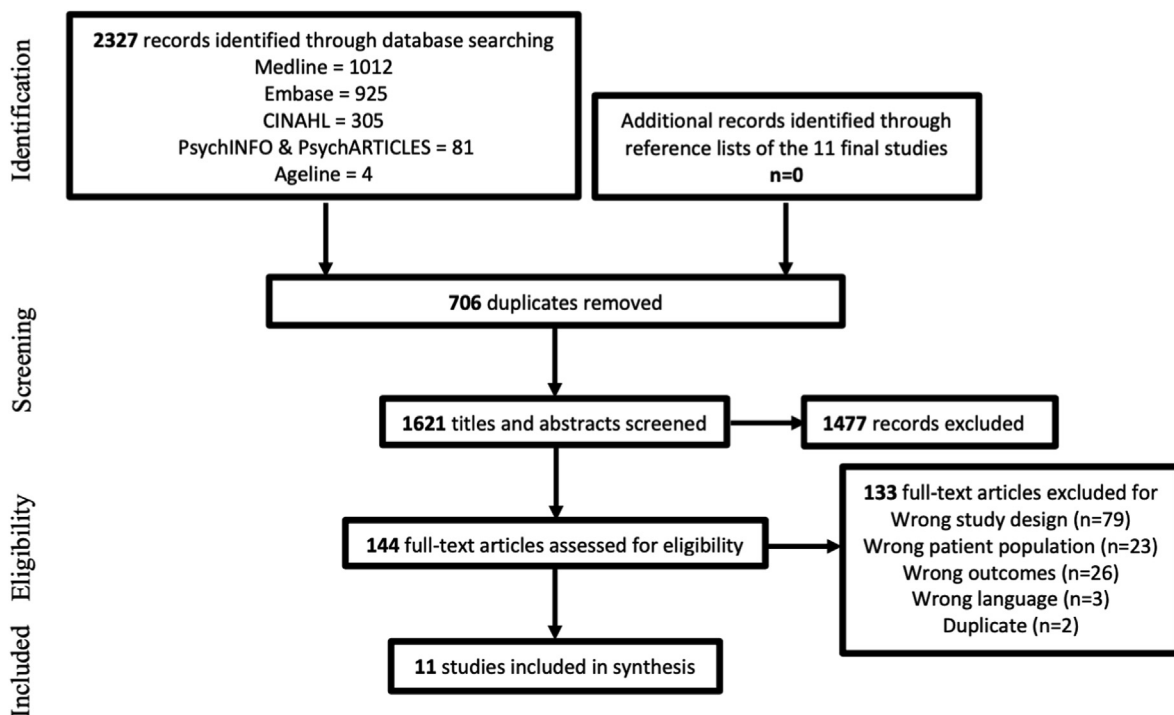
the reviewers (one reviewer by study) and added to the screening of the titles and abstracts if relevant.

#### Methodology appraisal

The Center for Evidence-Based Medicine (CEBM) Levels 1 of Evidence document<sup>27</sup> was used by two reviewers to assess the level of evidence of each selected study and limit the risk of bias. The CEBM enables the grading of the papers, which provides a qualifying of the evidence and assisting in clinical decision-making with recommendations. For example, level I evidence or consistent findings from multiple studies of levels II, III, or IV enables the formulation of strong recommendations, and can therefore be suitable for giving evidence-based advice to decision makers.

#### Synthesis

A narrative approach was used, including tables illustrating the extracted data (authors (year), country, title, study design, objective, population, outcomes and results, funding sources, and level of evidence), to provide descriptive summaries of selected studies to readers. This type of analysis is suggested for a rapid review.<sup>19</sup> A



**Fig. 1.** PRISMA flow diagram.

**Table 2**  
Synthesis of the eleven selected studies and their level of evidence.

Diagnosis	Author (year)	Country	Title	Study design	Objective
Stroke	Aguiar de Sousa et al. (2020) <sup>31</sup>	Europe	Maintaining stroke care in Europe during the COVID-19 pandemic: Results from an international survey of stroke professionals and practice recommendations from the European Stroke Organisation	Cross-sectional study	Understand the impact of the pandemic on access to and delivery of stroke care in Europe.
	Chudasama et al. (2020) <sup>29</sup>	47 countries (Europe:47%; North America:9% ...)	Impact of COVID-19 on routine care for chronic diseases: A global survey of views from healthcare professionals	Cross-sectional study	Evaluate the global impact of COVID-19 on routine care for chronic diseases.
	Zhao et al. (2020) <sup>38</sup>	China	Impact of the COVID-19 Epidemic on Stroke Care and Potential Solutions	Retrospective and simple descriptive study	Investigate the major changes in stroke care during the COVID-19 outbreak.
Multiple sclerosis	Capuano et al. (2020) <sup>37</sup>	Italy	Psychological consequences of COVID-19 pandemic in Italian MS patients: signs of resilience?	Prospective study, without a control group	Investigate anxiety, depression and quality of life (QoL) changes in people with multiple sclerosis (pwMS) during SARS-CoV-2 outbreak and lockdown in Italy.
	Mateen et al. (2020) <sup>32</sup>	United States and Canada	Impact of COVID-10 on U.S. and Canadian neurologists' therapeutic approach to multiple sclerosis: a survey of knowledge, attitudes, and practices	Cross-sectional study	Report the understanding and decision-making of neuroimmunologist and their treatment of patients with multiple sclerosis (MS) during the early stages of the COVID-19 outbreak.
	Radulovic et al. (2020) <sup>36</sup>	Montenegro	Attitudes of patients with relapsing-remitting form of multiple sclerosis using disease-modifying drugs in Montenegro regarding COVID-19 pandemic	Cross-sectional study	Examine the attitudes and behaviors of RRMS patients on disease-modifying drugs (DMD) in Montenegro in relation to the current pandemic.
	Stojanov et al. (2020) <sup>34</sup>	Serbia	Psychological status of patients with relapsing-remitting multiple sclerosis during coronavirus disease-2019 outbreak	Cross-sectional study	Investigate the possible impact of the COVID-19 pandemic and the state of emergency and the police lockdown in Serbia on psychological status and QoL of relapsing-remitting phenotype of multiple sclerosis (RRMS) patients.
Amyotrophic Lateral Sclerosis	Capozzo et al. (2020) <sup>28</sup>	Italy	Telemedicine is a useful tool to deliver care to patients with Amyotrophic Lateral Sclerosis during COVID-19 pandemic: results from Southern Italy	Cross-sectional study	Evaluate whether multidisciplinary assessment of ALS patients using telemedicine is feasible and acceptable to patients and caregivers in the era of Covid-19.
Chronic neurological diseases	Piano et al. (2020) <sup>30</sup>	Italy	An Italian Neurology Outpatient Clinic Facing SARS-CoV-2 Pandemic: Data From 2167 Patients	Cross-sectional study	Analyze the effect of COVID-19 pandemic and social restriction rules on patients with chronic neurological diseases.
Neuromuscular disease	Di Stefano et al. (2020) <sup>33</sup>	Italy	Significant reduction of physical activity in patients with neuromuscular disease during COVID-19 pandemic: the long-term consequences of quarantine	Cross-sectional study	Explore the impact of COVID-19 lockdown on physical activity (PA) in neuromuscular disease (NMD) and to quantify the expected reduction of PA levels, as well as its effect on the quality of life.
Chronic pain	López-Sánchez et al. (2020) <sup>35</sup>	Spain	Comparison of physical activity levels in Spanish adults with chronic conditions before and during COVID-19 quarantine	Cross-sectional study	Compare moderate-intensity and vigorous-intensity physical activity levels in Spanish adults with chronic conditions before and during COVID-19 quarantine.

minimum of two studies were required for the data synthesis.

## Results

### Literature search

The search strategy identified a total of 1621 records, after removing obtained duplicates ( $n = 706$ ). No records were added to the title and abstract screening after the review of the references lists of the studies included in the synthesis. The title and abstract screening reduced the number of papers to 144, associated with the exclusion of 1477 records, due to their irrelevance with the eligibility criteria. The full text screening allowed the extraction of eleven final records (see Fig. 1 for the PRISMA flow diagram). A list of the excluded studies at the full text screening, with the justification for exclusion, was added in the supplementary material of the paper.

### Characteristics of included studies

Table 2 contains a synthesis of the selected records and their level of evidence, grouped accordingly to the diagnosis reported in the papers.

Nine of the eleven selected studies were cross-sectional studies,<sup>28–36</sup> one was a prospective study<sup>37</sup> and one was a retrospective descriptive study.<sup>38</sup> Six studies were conducted in Europe,<sup>28,30,31,33,35,37</sup> one worldwide,<sup>29</sup> one in China,<sup>38</sup> one in the United States and Canada,<sup>32</sup> one in Serbia<sup>34</sup> and one in Montenegro.<sup>36</sup> Regarding the diagnosis of the included populations, three studies included stroke survivors,<sup>29,31,38</sup> one included individuals with amyotrophic lateral sclerosis (ALS),<sup>28</sup> four included individuals with multiple sclerosis,<sup>32,34,36,37</sup> one included individuals with chronic neurological diseases,<sup>30</sup> one included individuals with chronic pain<sup>35</sup> and one included individuals with neuromuscular disease.<sup>29,31–33</sup> Four studies were focused on the perception of healthcare workers and health centers.<sup>29,31,32,38</sup>

The level of evidence of ten of the eleven studies was 4 on the CEBM levels of evidence,<sup>27</sup> because relevant data were taken in a specific point in time in the studies (even in the retrospective descriptive study where the relevant data was the one-time survey and not the analysis of the decrease in stroke admission<sup>38</sup>). The level of evidence of the prospective study was 2b, because it was an individual cohort study.<sup>37</sup> At this point, it is hard to formulate specific recommendations regarding the CEBM levels of evidence,



Population	Outcomes and results	Funding	Level of evidence
426 participants 303 (81%) were stroke physicians/ neurologists and 111 (30%) reported having treated patients with stroke and COVID-19.	289 (77%) reported that not all stroke patients were receiving the usual care in their centers. 266 (71%) estimated that functional outcomes and recurrence rates of stroke patients would be affected by the changes in stroke care related to the COVID-19 outbreak. The areas of stroke care considered as being the most affected by the current situation were rehabilitation (n = 179 (48%)) and acute stroke care (n = 125(33%))	None	4
202 healthcare professionals. 75 (37%) were primary care physicians, 40 (20%) hospital physicians, 46 (23%) nurses, and 41 (20%) other healthcare professionals. 227 valid and complete datasets from the survey of the 280 stroke centers.	1% of respondents said that, within chronic diseases, the stroke area was the most impacted by COVID-19 due to the reduction of care.  Potential reasons for decreased stroke care admission: No change (3.1%), patients' and their families' fear in coming to hospital (93.8%), insufficient ambulance resources (14.1%), insufficient public transportation (46.7%) or lack of stroke first aid knowledge (35.2%)	The National Institute for Health Research (NIHR) Applied Research Collaboration East Midlands (ARC-EM)  The National Natural Science Foundation of China, Shanghai Natural Science Foundation, and China Research Engagement Funding from the University of Pennsylvania	4
67 pwMS, who had a neuropsychological evaluation before SARS-CoV-2.	57 (85.1%) reported significant changes in social and lifestyle habits and 39 (58.3%) reported more difficulties in daily life. No differences in levels of depression or anxiety were found between before (T0) and during the lockdown (T1). At T1, patients reported higher satisfaction with sexual function and higher social function score compared with T0.	Open access funding provided by Università degli Studi della Campania Luigi Vanvitelli within the CRUI-CARE Agreement	4
243 neurologists who had seen at least 10 MS patients per month in the past 6 months.	Among the 23% of specialists stating that they are aware of any of their MS patients self-discontinuing DMTs due to worries about contracting the virus, an estimated 7% of patients had self-discontinued their prescribed DMT in the setting of COVID-19. In 43% of cases, this was against medical advice.	Unrestricted investigator-initiated grant from Biogen, Inc.	4
101 patients with RRMS who were in the databases held by the Clinical Center of Montenegro.	On a scale of 1–5, some patients reported frequent mood changes ( $2.19 \pm 1.32$ ), fear of coming to regular check-ups with their doctors because of the COVID-19 pandemic ( $2.49 \pm 1.53$ ) and worry about the further course of their illness due to the current situation with COVID-19 ( $2.74 \pm 1.44$ ).	None	4
95 adult RRMS patients and a control group of 99 healthy individuals (HC).	43.1% of patients answered that they were sleeping worse than before the pandemic. 45.7% of patients did not experience any change in their daily activities. 43.6% reported that they were concerned they would experience some difficulties in medication availability and 72.4% were concerned they could not go to the hospital as usual. Patients who would not go to the hospital and try to find their doctor stated the fear of getting infected as the main reason (85.5%).	None	4
32: 23 with patients' caregivers and 8 with the patients; 1 had died. Predominantly males, 25 had a classical phenotype of ALS, 3 had Primary Lateral Sclerosis and 4 ALS-FTD.	13 out of 31 patients were performing physiotherapy at home before the outbreak and all of them reported a subjective feeling of discomfort after its discontinuation because of Covid-19 pandemic restrictions. Behavioral disturbances (irascibility, anger attacks) and sleep disturbances (difficulty falling asleep, frequent awakenings) were also reported in 15% and 20% of patients respectively, since the start of quarantine time.	Regione Puglia and from Italian Ministry of Health (Ricerca Corrente), and Regione Puglia and CNR for Tecnomed Puglia per la Medicina di Precisione	4
2167 patients with chronic neurological diseases, such as ALS (4%), dystonia (5%), multiple sclerosis (9%), myopathies (17%), Parkinson's disease (12%), stroke (11%) ...	Patients experienced subjective worsening of neurological condition (19%; 48% for ALS patients), suspension of hospital treatments or physiotherapy (30%; 97% for dystonia patients), difficulty finding medications (4%; 8% for Parkinson and Huntington patients) and a need for urgent consultation (7%; 14% for ALS patients), at different degrees depending on their disease.	Not declared	4
268 Italian subjects: 149 had a NMD, while 119 healthy subjects were recruited as a control group. 163 participants with chronic conditions such as chronic neck pain (n = 14) and chronic low back pain (n = 18).	A significant reduction of PA was reported for walking activity, total PA levels and MVPA levels, while no difference was found for vigorous-intensity PA and moderate-intensity PA in patients with NMD. Time of moderate-intensity PA in minutes/day was $109.3 \pm 126.10$ before and $77.5 \pm 57.5$ after COVID-19 in participants with chronic neck pain and was $106.1 \pm 70.9$ before and $87.7 \pm 63.2$ after COVID-19 in patients with chronic low back pain. Time of vigorous-intensity PA in minutes/day was $41.8 \pm 46.4$ and $40.4 \pm 36.8$ before and after COVID-19 in participants with chronic neck pain and was $61.1 \pm 48.5$ and $51.4 \pm 40.8$ before and after COVID-19 in patients with chronic low back pain. However, no decreases were statistically significant.	Open access funding provided by Università degli Studi di Palermo within the CRUI-CARE Agreement  None	4

because of the limited number of papers that assessed different factors.

### Outcomes of included studies

Table 3 presents a synthesis of the outcomes of the studies, grouped accordingly to the PECO and ICF frameworks.

The outcomes of the selected studies mostly included environmental factors, specifically regarding the services, systems and policies. Indeed, four out of the eleven studies' outcomes were exclusively about healthcare access<sup>29,31,32,38</sup> and four others included questions about this element.<sup>28,30,34,36</sup> Examples of barriers related to services addressed in studies were the cessation of home-based physiotherapy,<sup>28,30</sup> insufficient ambulances and public transportation resources to go to the hospital,<sup>38</sup> difficulty finding medications<sup>30</sup> and changes in usual care.<sup>31</sup>

Authors also reported changes in body functions and structures. Regarding mental functions, more precisely emotional, temperament and personality functions, some people with disabilities and caregivers reported behavioral disturbances (irascibility, anger attacks)<sup>28</sup> and frequent mood changes.<sup>36</sup> Patients' and families' fear of coming to hospital was also discussed.<sup>34,36,38</sup> For the sleep functions, sleep disturbances (difficulty falling asleep, frequent awakenings)<sup>28</sup> and a worsening of sleep<sup>34</sup> were reported. For the structures of the nervous system, a subjective worsening of neurological condition was noted.<sup>30</sup> Finally, regarding the genital and reproductive functions, patients in a study reported higher satisfaction with sexual function during the lockdown than before.<sup>37</sup>

Regarding activities and participation, restrictions for the acquisition of goods and services and limitations for the use of transportation were noted in the sections about barriers from environmental factors. A reduction of physical activity was also reported, and the changes were statistically significant in one study<sup>33</sup> and non-statistically significant in another.<sup>35</sup> Some people also reported significant changes in their social and lifestyle habits and more difficulties in their daily life.<sup>37</sup>

### Discussion

The objective of this paper was to review the impact of the COVID-19 pandemic and associated isolation and protective measures on people with physical disabilities. Multiple studies have been conducted since the start of this global pandemic, with more than 40 000 papers resulting from the search of the term "COVID-19" on PubMed on August 20, 2020. Even if approximately 15% of the global population lives with a disability,<sup>8</sup> only eleven studies were included in this paper after the literature search. This highlights the lack of research about the impacts experienced by people with physical disabilities during the COVID-19 pandemic.

Findings from this review provide examples of impacts experienced by this group, with a certain focus on access to healthcare. Four out of the eleven studies were exclusively about healthcare access and four others included questions about this element. Significant decreases in stroke admissions were noted<sup>39</sup> and might suggest that people's fear of consulting during the COVID-19 pandemic<sup>38</sup> will result in long-term effect, because people may not have received the required medical and rehabilitation services. This could in turn lead to a decrease in the level of autonomy and functioning of stroke survivors. While these studies were restricted to stroke services, it appears likely that similar phenomenon occurred in other clinical populations. It will thus be important that future studies assess the reduction of rehabilitation, community support and home-based services during the pandemic and get conclusions about the various impacts of this scarcity of services on

the individuals with disabilities, their relatives and the healthcare system regarding different conditions and countries.

There was a clear medical focus in published papers during this pandemic, which makes sense regarding the nature of this global event and the urgent need for a vaccine.<sup>40</sup> The nature of COVID-19, which was first appraised as a respiratory and inflammatory disease, might also explain why the few studies about people with physical disabilities included neurological diagnosis such as stroke, ALS, multiple sclerosis and chronic neurological diseases. The possible neurological consequences of COVID-19 on those diseases<sup>41–43</sup> might have made them a population of interest for researchers during the crisis. Certain populations, such as amputees and people with visual and hearing impairments, may be less susceptible to medical complications due to COVID-19 than people with neurological disabilities. This, in turn, might explain the lack of published studies regarding non-neurological conditions. However, measures associated to the pandemic, such as social isolation or generalized use of face masks, might have important social impacts on these groups.<sup>44,45</sup> Therefore, more studies are needed to address these questions, and it is urgent that we get more insight on the experience of these marginalized but prevalent subgroups of the population, to improve policies and procedures and to reduce potential inequality in future crisis management.

Behavioral and sleep disturbances were also reported in people with ALS<sup>28</sup> and multiple sclerosis,<sup>34,36</sup> but it may be partially associated with the evolution of the diseases and not with the COVID-19 pandemic. It is thus important to distinguish the impact of the pandemic of the natural course of a disability to adjust care pathways regarding the needs of this population or to plan healthcare services responses for such issues in the future. However, similar effects were noted in studies about the general population,<sup>5,46</sup> suggesting that sleep disturbances and mood changes may be influenced or accentuated by the COVID-19 pandemic.

Reported higher satisfaction with sexual function in individuals with multiple sclerosis<sup>37</sup> also suggests there may be positive impacts of the COVID-19 pandemic on the population. Although this finding should be explored in different populations and confirmed with more research, future studies should consider this aspect in order to have an overview of all the impacts of the pandemic, both negatives and positives. This could enable the retention of certain measures taken during the pandemic, for example the increase of telemedicine and delivery services.

Despite the limited empirical evidence found regarding the impact of COVID-19 on people with disabilities, the subject was not entirely absent in the scientific literature. Some commentaries, for example, urged governments to provide adequate health resources to populations particularly vulnerable to the development of psychological disorders such as the deaf community.<sup>45</sup> Other authors highlighted the need to ensure equity in medical decisions<sup>47</sup> and the necessity to gather information about infection and mortality rates for people with physical disabilities coupled with other health conditions.<sup>48</sup> It is thus likely that those concerns will result in a larger number of studies about this topic in the forthcoming years. However, a gap in knowledge might remain with regards to the immediate impact of the COVID-19 pandemic on our population of interest.

Furthermore, available data regarding people with physical disabilities could not be included in this rapid review because they were not yet published in a peer-reviewed paper. For instance, preliminary results of a study regarding people with visual impairments<sup>49</sup> highlighted potential problems in that population, such as people's fear of having a breakdown, increased anxiety, and concerns about others assisting them in physical tasks like going to the grocery store during the COVID-19 pandemic.<sup>50</sup> Such studies should therefore be kept in mind in order to keep track of future

**Table 3**  
Synthesis of the outcomes of included studies.

Outcomes			Population	Reported by	
ICF components		Description			
Environmental factors	Transportation services, systems and policies	Insufficient ambulance resources were a potential reason for decreased stroke admission	Stroke <sup>38</sup>	Stroke centers	
		Insufficient public transportation was a potential reason for decreased stroke admission	Stroke <sup>38</sup>	Stroke centers	
	Health services, systems and policies	Discontinuation of physiotherapy because of Covid-19 pandemic restrictions	Amyotrophic Lateral Sclerosis <sup>28</sup> and chronic neurological diseases <sup>30</sup>	Patients <sup>28,30</sup> and caregivers <sup>28</sup>	
		Suspension of hospital treatments	Chronic neurological diseases <sup>30</sup>	Patients	
		Need for urgent consultation	Chronic neurological diseases <sup>30</sup>	Patients	
		Concerned they could not go to the hospital as usual.	Relapsing-remitting multiple sclerosis (RRMS) <sup>34</sup>	Patients	
		Fear of coming to regular check-ups with their doctors because of the COVID-19 pandemic	RMMS <sup>36</sup>	Patients	
		Not all patients were receiving their usual care in their centers	Stroke <sup>31</sup>	Stroke professionals	
	Products or substances for personal consumption	The areas of stroke care considered as being the most affected by the current situation were rehabilitation and acute stroke care	Stroke <sup>31</sup>	Stroke professionals	
		1% of respondents said that, within chronic diseases, the stroke area was the most impacted by COVID-19 due to the reduction of care	Stroke <sup>29</sup>	Healthcare professional	
Difficulty finding medications		Chronic neurological diseases <sup>30</sup>	Patients		
Concern about medication availability		RMMS <sup>34</sup>	Patients		
Body functions	Emotional, temperament and personality	Self-discontinuation of prescribed DMT, against medical advice in some cases	Multiple sclerosis <sup>32</sup>	Neurologists	
		Frequent mood changes	RMMS <sup>36</sup>	Patients	
	Genital and reproductive	Behavioral disturbances (irascibility, anger attacks)	Amyotrophic Lateral Sclerosis <sup>28</sup>	Patients and caregivers	
		No differences in levels of depression or anxiety were found	Multiple sclerosis <sup>37</sup>	Patients	
		Patients' and their families' fear in coming to hospital was a potential reason for decreased stroke care admission	Stroke <sup>38</sup>	Stroke centers	
		Awareness of MS patients self-discontinuing DMTs due to worries about contracting the virus	Multiple sclerosis <sup>32</sup>	Neurologists	
	Sleep	Worry about the further course of their illness due to the current situation with COVID-19	RMMS <sup>36</sup>	Patients	
		Sleep disturbances (difficulty falling asleep, frequent awakenings)	Amyotrophic Lateral Sclerosis <sup>28</sup>	Patients and caregivers	
	Body structures	Nervous system	Worsening of sleep	RMMS <sup>34</sup>	Patients
			Higher satisfaction with sexual function during the lockdown than before	Multiple sclerosis <sup>37</sup>	Patients
Activities and participation	Acquisition of goods and services	Subjective worsening of neurological condition was noted	Chronic neurological diseases <sup>30</sup>	Patients	
		Estimation that functional outcomes and recurrence rates would be affected by the changes in stroke care	Stroke <sup>31</sup>	Stroke professionals	
	Use of transportation	See environmental factors.			
		Looking after one's health	Significant reduction of physical activity (PA) was reported for walking activity, total PA levels and moderate-to-vigorous PA levels.	Neuromuscular disease <sup>33</sup>	Patients
	Carrying out daily routine	Non-significant reduction of PA	Chronic neck pain and chronic low back pain <sup>35</sup>	Patients	
		Experience of change in daily activities	RMMS <sup>34</sup>	Patients	
	Interpersonal interactions and relationships	Significant changes in social and lifestyle habits	Multiple sclerosis <sup>37</sup>	Patients	
		More difficulties in daily life	Multiple sclerosis <sup>37</sup>	Patients	
	Higher social function score	Multiple sclerosis <sup>37</sup>	Patients		

papers that could help people understand the impacts and needs of people with physical disabilities.

A major lack of evidence regarding the impacts on children with physical disabilities was noted. Indeed, none of the selected papers included children, despite their vulnerability during this crisis. The closure of schools may have stopped services, such as occupational therapy or speech therapy, which are often delivered in class. The impacts on children with physical disabilities should be assessed to assure an adequate response towards their needs and to minimize possible developmental impacts.

The impact of COVID-19 should be considered by governments and institutions when taking actions and decisions about the healthcare access and the public health measures to implement during the pandemic and during future health crisis. Mental health

concerns have been mostly reported among the elderly,<sup>51</sup> health-care workers<sup>52</sup> and the youth.<sup>53</sup> People with physical disabilities should not be forgotten, especially since they already face substantial barriers in their everyday life<sup>10</sup> and have higher risks of mental health issues.<sup>11,13</sup>

#### Strengths and limitations

Our rapid review, performed and reported in accordance with PRISMA guidelines, is a starting point for a more complete agenda of research in disability sciences. Its relevance for scientists, clinicians and decision makers should be emphasized. However, some limitations might have affected our conclusions. Studies about people with physical disabilities might have been excluded because



they did not provide specific descriptions of the assessed population. For example, some studies did not differentiate people with strokes from those with diabetes and hypertension in their analyses,<sup>54,55</sup> or children with physical disability from children with attention deficit disorder,<sup>56</sup> resulting in their exclusion from the review. Furthermore, letters to the editor and position papers containing original data were excluded because of our eligibility criteria.<sup>57,58</sup> Only peer reviewed papers were included, therefore excluding grey literature. The search strategy was limited in six online databases and was not conducted in trial registries. Language restrictions (English or French) might also have resulted in the exclusion of important data. Moreover, we decided to limit the review to people with physical disabilities. However, impacts experienced by people with intellectual and developmental disabilities should also be considered and assessed in future reviews, as they are also considered as a population vulnerable to negative outcomes during this crisis.<sup>59–61</sup> Another limitation of this review is the lengthy publishing process of some journals, which might result in a lack of studies about the impact of COVID-19 on people with physical disabilities in the short term. Indeed, some medical journals have accelerated their publishing process for studies about COVID-19, but it does not seem to be the case for all rehabilitation journals, which generally publish studies about people with physical disabilities. An update of this review will therefore be needed to confirm and expand the results.

### Implication for practice and policy

Results obtained with this rapid review have highlighted difficult access to services for people with disabilities during the pandemic. It is of utmost importance to better understand the motives under this situation (avoidance of services by users, difficulty accessing the services, etc.) to rethink the question of access to rehabilitation services in context of crisis, such as pandemic, war or natural disaster. Our review also underlines the lack of research about the impacts of the COVID-19 pandemic on people with physical disabilities, a population that is too often forgotten in governmental decisions<sup>62</sup> and that should be included in future crisis strategies and response planning.<sup>63</sup> Studies with the main goal of investigating the impacts on this population should therefore be conducted if we want to better respond to their specific and unique needs.

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The authors declare no conflict of interests.

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### Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.dhjo.2020.101014>.

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