

# Requirements to develop an online platform supporting access to outdoor leisure activities for people with disabilities

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## INTRODUCTION

Fifteen percent of the world population lives with one or multiple disabilities [1]. With an aging population, this number is expected to grow. “Disability” is an umbrella term that designates the limitation experienced by an individual to perform activities, restrictions or the negative interaction between an individual and their environment [1]. People with disability (PWDs) can encounter diverse challenges to access their social and physical environment, leading to social isolation and reduced participation, including for outdoor physical activities (e.g., hiking, skiing) [2–4]. Participation to outdoor leisure activities brings individual benefits (e.g., physical health, autonomy) and collective benefits to the communities in which PWDs live (e.g., development of new social network, disability awareness) [5–7]. Outdoor physical includes non-motorized activities practiced in a dynamic relationship with the elements of nature and according to modalities other than sports competition [8]. Access to outdoor physical activities is often compromised by barriers from the individuals themselves, such as lack of financial or human resources [9–11]. The provision of outdoor physical activities often has additional barriers, such as inaccessible facilities or inappropriate programs for people with mobility impairments [10,11]. Initiatives exist to facilitate access to outdoor activities: the Jooay app, for instance, promotes recreation for children and youth living with disabilities by enabling them to locate appropriate activities and providing a supportive community for their families (<https://jooay.com/about-us/>). But these initiatives have limitations: Jooay target only children; other platforms do not focus on PWDs, therefore not fully answering their needs. In their qualitative study, Menzies et al. revealed that the need for accompaniment as one of the main barriers to outdoor physical activity for people with mobility impairments [7]. Quality accompaniment is essential since PWDs report concerns about their health and safety during outdoor activities, such as difficulties during transfers [7]. L’Association Régionale de Loisir pour Personnes Handicapées de la Capitale-Nationale (ARLPH de la Capitale-Nationale (03), <https://arlp03.com>), a not-for-profit organization from Canada (Quebec City) promote access to leisure activities to PWDs, report a strong need for PWDs to be accompanied by trained volunteers when they participating in outdoor recreational physical activities. However, PWDs and volunteers face challenges to reach each other. To this end, the ARLPH03, our community partner for this study, specific objectives to develop an online platform that offers: 1. Training resources for PWDs and volunteers to favor a safe practice of outdoor activities, 2. Matching between PWD and volunteer and 3. A list of available adapted equipment. Therefore, the aim of this study was to identify factors to consider in the development of such platform to address users’ needs.

## METHODS

This study is part of a larger research-action study and includes two steps. 1. A scoping review following the framework of Levac et al. [12]. The search was conducted in four databases and in Google advance search for the grey literature with the support of a librarian. Every step of the review was independently conducted by two co-authors; they then compared their results to reach a consensus. The references of the scientific sources included in the final analysis were checked for relevant studies to add into the analysis. Descriptive data analyses were performed. 2. In parallel, a qualitative descriptive study was conducted with potential users of the platforms (PWDs and volunteers). Recruitment continued to represent a diversity of profiles until data saturation was reached. Participants were individually interviewed (audio recorded) either in person or via Teams© or Zoom© and completed a questionnaire that includes socio-demographic data (i.e., age, gender), their profile towards disability and outdoor activities (i.e., for all, their experience about outdoor activities; for PWDs, the type of disability and their needs for accompaniment; for volunteers, their experience of accompaniment of PWDs) and their inclination to accept technological innovations with the classification of Rogers [13]. Then, an interview guide (previously developed with our partner the ARLPH03) was used for the semi-structured interviews. This guide

focused on users' needs towards the platform content and design. Quantitative data were descriptively analyzed to draw the profile of the participants. Qualitative interviews were integrally transcribed and an inductive thematic analysis was then performed [14]. All the verbatims were assigned to codes translating what the participants said. Samples of the transcription were independently coded with NVivo by two different co-authors who then discussed their results with the research team to ensure a reflexive process during the analysis and minimize the impact researchers' opinions on the result interpretation. Then these codes were categorized into themes which are presented in the results.

## **RESULTS**

### **Scoping review**

Seven scientific studies and ten websites were included in the final analysis of the scoping review. The scientific studies included were published between 2011 and 2020 and mainly conducted in large urban centers (n=3) and in the US (n=5). These studies included a mean of 35 participants, all PWDs with a majority of women (52%) with a mean age of 51 years old. Five of the seven studies presented mobile apps; two presented a website. Studies have reported multiple obstacles to the use of online platforms supporting access to physical activities including the following: lack of digital literacy, technical issues (e.g., automatic shut-down of the app), unintuitive design and the lack of confidence towards the technology by the users. Facilitators reported were the following: possibility to personalize your online space, accessibility features of the navigation and facilitators to social interactions. Regarding the websites included from the Google search, they reported initiatives from the UK, France and Canada (n=3 respectively). Seven presented platforms in the form of websites (70%) and two mobile apps (20%). None of the included sources from Google reported obstacles to the use of their platforms; the facilitators reported were the following: social interaction, online recording of the practice and information resources. Among these sources, a trend emerged in terms of visuals and navigation within the platform (e.g., a color palette in shades of blue and green, a navigation following the recommendations of Web Content Accessibility Guidelines [15]).

### **Qualitative study**

Thirty-one individuals (n=16 PWDs (physical and visual disabilities)) and n=15 volunteers) participated in the study. The activities the most practiced among the whole sample were hiking (n=24 participants) and riding a bike (n=18). PWDs needed support mainly for mobility (e.g., support for transferring from a wheelchair to the adapted equipment). Volunteers had a mean experience in accompanying PWDs of 8.6 years. Early adopters were the most represented among the categories of Rogers (n=16), only one person identified as a laggard (i.e., less likely to adopt innovation). Five main themes emerged from the qualitative interviews to represent the participants' needs and for the development of an online platform. 1. Offering multiple features (e.g., technical support, different ways to book the activity, reminders of the activity) was essential to cover the variety of needs participants may have. 2. Providing various training resources including training about the specific needs of certain PWDs was required by both groups; they also suggest offering these resources in multiple formats (e.g., audio capsule, video, summary cards). 3. Providing information, such as places of adapted practice, available adapted equipment or group practice events, directly into the platform was said to have the potential of greatly improve access to outdoor activities. 4. Offering multiple ways to match PWDs with trained volunteer would address the needs of all users; the possibility of applying different criteria or filters according the activity, the type of needs or the area of practice was suggested. 5. Finally, the way the platform is presented and its navigation were reported as a paramount aspect to consider, not so much in term of esthetics but in term of accessibility.

## **DISCUSSION**

Combining the results from the scoping review and the qualitative interpretative study identified the features necessary to create a platform that will facilitate access to outdoor activities for PWDs by matching them with a volunteer who can accompany and support them. Our community partner and a previous study report that PWDs need to be accompanied during outdoor activities [7]. However, existing online solutions do not meet their needs. The platform that will be developed based on the elements identified through the two studies has, according to the participants, the potential to make a difference for a safe and enjoyable access to outdoor activities. One of the strengths of the review is its exhaustivity since four databases and Google have been searched. In addition, the qualitative study gathers the PWDs' opinions and needs as well as those of the volunteer, which is, to our knowledge, a first in this area of research. However, the review has only been conducted in French and English, therefore relevant sources published in other languages may have been omitted. Another limitation of this study is

that, despite efforts to represent various disabilities and experiences, a lack of diversity exists in terms of ethnicity and appetite for innovation among the participants. Moreover, no individual with hearing impairment was included in the qualitative study. Result interpretation has taken these limitations into consideration to build the future online platform.

## CONCLUSION

This project builds on community engagement and co-creation to support PWDs' participation in outdoor physical activities through the development of an online platform facilitating the matching of PWDs and volunteers and providing them with information and training resources. Future research steps will focus on testing a prototype of the online platform developed based on the results of the scoping review and the qualitative study.

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