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Research Article

Accessible tourism – Nature-based activities for all, needs for assistive devices and information among people with disabilities

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ABSTRACT

Involvement in nature-based activities is shown to increase health and wellbeing. However, some people with disabilities require assistive devices to be able to participate in such activities. By exploring the needs of persons with disabilities regarding assistive devices, this study aims to gain a better understanding of how accessible nature-based experiences for all can be supported. The article builds on a large-scale digital survey of the needs and experiences of persons with disabilities who were contacted through user organizations and a rehabilitation center in Norway. Most of the respondents reported that they brought their own assistive devices for activities of daily living, such as crutches, wheelchairs, hearing aids, or a white cane. However, they wanted to rent or lend assistive devices for sports and outdoor activities. Information about accessibility was reported to be very important but often lacking. To allow for more universally designed services and environments, nature-based travel destinations should aim to provide assistive devices for activities along with ordinary equipment, information about it on their websites, and competent staff to make nature-based experiences accessible for all.

Management implications

This study highlights the importance of improving accessibility in nature-based tourism through the provision of assistive devices for outdoor activities, such as sit-skis and other adaptive equipment. Managers of rural travel destinations are encouraged to collaborate with competence centers for training and adaptation, and to establish loan and reuse schemes to ensure efficient use of such equipment. Providing clear online information about accessibility features can further enhance inclusivity and broaden participation in nature-based activities.

1. Introduction

The World Health Organization (WHO) estimates that 1,3 billion people, about 16 % of the global population, currently experience significant disability. This number is increasing partly due to population aging and to an increase in the prevalence of noncommunicable diseases (WHO, 2025). Nature-based activities are important for human health and wellbeing; however, people with disabilities often face barriers that limit their participation (Wall-Reinius, Kling, & Ioannides, 2022).

This article examines the need for assistive devices and accessible, and reliable information about the availability of such devices among persons with disabilities, to enable participation in nature-based recreational and physical activities during travel in Norway. We also examine whether – and if so, what type of information selected travel destinations provide on their websites. Specifically, we investigate whether they offer

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details about available activities and whether assistive devices for loan or rent are available to enable participation for people with disabilities.

Further, this article presents a sub-study of the research project Accessible tourism for inclusion and value creation in rural areas (ACCESSTOUR), funded by the Norwegian Research Council (NRC ES686251 - Project number:322655 - BIA). The overall aim of the ACCESSTOUR project is to develop sustainable destinations and local communities in rural areas through the development of more accessible tourism (Antonsen et al., 2023). The main objective of ACCESSTOUR is to increase knowledge about how accessible destinations and local communities can create value for tourism industry, visitors and residents in different age groups and with diverse functional abilities. The insights generated will inform the development of models and tools designed for practical applications by both destination management organizations and public sector stakeholders. ACCESSTOUR includes 26 partners from the field of research, rehabilitation, tourism, the public sector and organizational life, and is, thus, both an interdisciplinary and cross-sectoral project (Antonsen et al., 2023). The partners include destination management organizations and tourism providores located in rural coastal regions of northern Norway, as well as in the mountains of southern Norway, where the rehabilitation center which recruited most of the participants of this study is located.

One of the barriers for participation in nature-based activities is the lack of assistive devices for persons with disability. In Norway, assistive devices for activities of daily living are provided free of charge for persons with disabilities by the Norwegian Labor and Welfare Administration (NAV) (NAV, 2015). However, assistive devices for sport and leisure activities are only provided free of charge for persons under 26 years. Persons with disabilities aged 26 and above are required to pay a deductible, and only a limited amount of funding is allocated for this purpose each year (NAV, 2015).

Assistive devices must be individually tailored to each person, which requires skilled professionals. The Norwegian National Audit Office has revealed several weaknesses in the NAV system, and several violations of rules related to the procurement of assistive devices (National Audit Office, 2017). A lack of competence in municipalities regarding adaptations and training in use of assistive devices is also documented (Ministry of Labor and Social Affairs, 2017), in addition to lack of flexible concepts and models, e.g. for rental, multi-use and reuse of such devices. Such discrepancies may lead to undesired variation in the national provision of assistive devices, inadequate adaptation and training in the use of the devices, and an increased risk of suboptimal device use (Bergem, 2018, 2020, Gjessing & Jahnsen, 2021). A recent Norwegian study on the use of assistive devices in families with children (0–12 years) with Cerebral Palsy (CP) found that, on average, each child uses 2.5 aids, and that these are perceived as highly beneficial in daily life, particularly during traveling, in caregiving, self-care, transfer and participation in activities and play (MoenDamkjær & Østensjø, 2023).

Both the present article and the overarching ACCESSTOUR project are informed by the United Nations (UN) Convention on the Rights of Persons with Disabilities (UN CRPD, 2006). The UN CRPD Medarić et al., 2021recognizes and promotes the right of persons with disabilities to participate in leisure, recreational, and tourism activities. Therefore, appropriate measures to ensure access to sports, recreational, leisure and tourism activities, venues, resources and services should be taken (UN 2008; CRPD Art.30, 5 a-e). This is widely agreed upon in literature and is supported by various documents by the European Network for Accessible Tourism (ENAT, 2007), as well as in studies by Figueiredo et al., 2012, Chiarelli et al., 2018).

1.1. Relational understanding of disabilities

The UN CRPD defines persons with disabilities as those who have long-term physical, mental, intellectual, or sensory impairments which, in interaction with various barriers, may hinder their full and effective participation in society on an equal basis with others (UN CRPD, 2006, Article 1). Both the wording of the UN CRPD and the emphasis on the interaction between the individual and barriers reflect a relational understanding of disabilities (Lid, 2023). According to the relational understanding of disability, which is also referred to as the Nordic model or gap model, disability is a phenomenon that emerges in the interaction, or rather, in an interactional gap between the person and built and social environment (Lid, 2023). As such, the relational model takes into an account both the materiality of the impairments, which is present in the medical model but wrongly considered the cause of disability, and the built environmental and attitudinal barriers characteristic of the social understanding of disabilities, and importantly, the interplay between them. The ICF model (International Classification of Functioning, Disability and Health) of WHO (2001), also complements the relational perspective.

The fact that people have different abilities and that we interact with the environment in different ways means that accessibility and barriers are experienced differently. It is not a given that individuals with impairments perceive themselves as disabled. Impairments do not necessarily result in activity limitations and/or participation restrictions. Opportunities for participation are contextual and experienced differently across situations. Therefore, a disability is always relative, time-limited and dependent on the environment (Tössebro, 2004), as functioning is an interaction between individual characteristics, environments, and specific situations, understood as the relational model of disability (Lid, 2020). The relational model acknowledges the complex interplay between human beings and their social, cultural, material, and political environments.

WHO (2001) defines four main categories of disability; Motor/-physical, intellectual, visual and hearing, each with various forms and degrees (Katzenholz et al., 2015; Figueiredo et al., 2012). These categories are also used in this article. McKercher and Darcy (2018), however, point out that much of the research treats persons with disabilities as a homogenous group, ignoring the wide range of disability categories.

In this article, disability is conceptualized as a relational phenomenon, arising from the dynamic interaction between the individual and environmental factors. For persons with disabilities to have their rights fulfilled in accordance with the UN CRPD, the environment must be adapted – including tourism destinations.

1.2. Accessible tourism

In this article, we use the lens of accessible tourism to gain a better understanding of how accessible nature-based “experiences for all” can be supported. Internationally, there is an ongoing effort to make public and private travel destinations, activities and services accessible to everyone, regardless of age or functional level. Although accessible tourism does not have an internationally recognized definition, there is broad consensus on avoiding separate services for separate groups of people and instead developing universal options for all (Darcy & Buhalis, 2011. Darcy and Buhalis (2011) however, have attempted to develop an overarching framework to better understand accessible tourism, emphasizing collaboration among various stakeholders. They define accessible tourism as the creation and provision of universally designed products, services, and environments that enable persons with diverse access needs—such as mobility, vision, hearing, and cognitive impairments—to participate independently, equitably, and with dignity. This approach considers accessibility across the lifespan, benefiting not only people with permanent or temporary disabilities, but also older people, families with young children, and those working within safer and more socially sustainable environments.

Globally, the population is aging, leading to a rising prevalence of chronic diseases and injuries (UN Decade of Healthy Ageing, 2020). This trend will likely lead to an increased demand for accessible nature-based activities, and a corresponding increase in the need for assistive devices (UN Decade of Healthy Ageing,2020).

Tourism and leisure activities are increasingly recognized as

Table 1
Participant characteristics – age groups by type of disability.

Age	Physical disabilities	Visual impairment	Hearing impairment	Intellectual disabilities	Other	Total
<19 years	15 %	39 %	19 %	49 %	37 %	22 %
19–39 years	19 %	21 %	25 %	18 %	16 %	19 %
40–59 years	33 %	21 %	16 %	25 %	40 %	31 %
60+ years	33 %	18 %	41 %	8 %	7 %	29 %
Total	100 %	100 %	100 %	100 %	100 %	100 %
N	264	28	32 %	88	43	330

essential components of a contemporary lifestyle (Kastenholz et al., 2015; McCabe, 2009). However, empirical evidence indicates that persons with disabilities encounter greater barriers and challenges in tourism settings compared to everyday life (Figueiredo et al., 2012; Groulx et al., 2024). These individuals must navigate a complex array of obstacles arising not only from their impairments but also from predominantly non-inclusive societal structures (Kastenholz et al., 2015, p. 1265). The international body of knowledge on accessible nature- and experience-based tourism in rural areas, has revealed several barriers, which restrict or prevent people with disabilities from participating in such tourism activities. Three broad categories of barriers to participation have been identified by Eichhorn and Buhalis (2011).

A) Limited physical access (e.g. inaccessible transportation, accommodation facilities and attractions.
B) Attitudinal barriers, the negative attitudes non-disabled people have regarding people with disability's participation.
C) Lack of information, as people with disabilities require detailed information on accessibility.

These barriers are also supported by Kastenholz et al. (2015), Dickson et al. (2024).

Within accessible tourism research, there has been a call for stakeholder involvement in the development of accessibility (Gillovic & McIntosh, 2015). Yet, there is scarce empirical research on stakeholder involvement, and existing research unveils minimal collaboration between stakeholders in the development of accessible activities for all (Dickson et al., 2024; Harju-Myllyaho & Jutila, 2016; Nyanjom et al., 2018; Hua et al., 2024). Advocating for inclusive tourism is a key strategy to reduce the exclusion of people with disabilities, both in tourism practice and in promotional literature (Benjamin et al., 2020; Nyanjom et al., 2018). To sustain and further advance accessible tourism, collaboration among stakeholders is essential (Dickson et al., 2024; Harju-Myllyaho & Jutila, 2016; Nyanjom et al., 2018; Hua et al., 2024).

The UN CRPD article 30 recognizes that participation in society is the right of all individuals, and postulates that activity participation can be facilitated or inhibited by factors outside the individual (Packer et al., 2007). Related to accessible tourism, participation in nature-based activities is considered to be one of the most significant barriers (European Commission, 2014). The ability to travel is widely regarded as a key indicator of successful rehabilitation and social reintegration, contributing significantly to the enhancement of self-esteem and autonomy among persons with disabilities (Hua et al., 2024). Facilitating accessible travel for this population is both a societal responsibility and a fundamental human rights obligation (Chiarelli et al., 2018). It also aligns well with the United Nations' Sustainable Development Goals (SDGs) in the 2030 Agenda, particularly SDG 3, Good Health and Well-being, and SDG 10, Reduced Inequalities (UN, 2015). Accessible tourism plays a critical role in promoting these objectives, as well as broader social inclusion.

1.3. Assistive devices for activity

Nature-based activities are not always accessible for all. To facilitate participation, some people need assistive devices specifically designed to enable or facilitate participation in physical activities, recreational activities, and sports for individuals with disabilities. Such aids can compensate for reduced functional ability and contribute to increased independence and participation in society. According to Norwegian Ministry of Labor and Inclusion, assistive activity devices are "aids specifically designed to enable individuals with reduced functional ability to participate in physical activities. These devices are intended to directly compensate for a functional impairment, allowing the user to engage in their desired physical activities" (2014–9). Examples of assistive devices for activity include specially adapted bicycles, sit-skis, swimming aids, sports wheelchairs, and various types of orthopedic or technical aids tailored to different activities.

As outlined earlier, persons with disabilities often face problems in undertaking several recreational activities because of products and technology, inaccessible sites, facilities and lack of appropriate information (Burns et al., 2009; Packer et al., 2007). Common faced barriers and constraints are related to assistive technology/equipment requirements (Dickson et al., 2024). A frequently encountered barrier for persons with special access needs when traveling is lack of information concerning accessibility at travel destinations (Benjamin et al., 2020; Chiarelli et al., 2018; Dickson et al., 2024; Gomes & Eusébio, 2023; Groulx et al., 2024; Nyanjom et al., 2018). This means that credible sources of information become particularly important (Figueiredo et al., 2012; Packer et al., 2007; European Commission, 2014). According to Packer et al. (2007), it is critical to have access to accurate and reliable information about products and technology. It also concerns the need to make existing information accessible to all (ETOUR, 2020).

In the context of accessible tourism, ensuring the availability of adaptive equipment should be considered a priority (Hua et al., 2024). This aligns with the assertions of Figueiredo et al. (2012) and Kastenholz et al. (2015) that assistive devices which allow persons with disabilities to perform leisure activities and exercise should be included in activities offered. This could also be one of the reasons for the frequent disparity between activity preferences and actually performed activities (Burns et al., 2009; Figueiredo et al., 2012; Kastenholz et al., 2015).

The objectives of this article are.

1.3.1. To explore

- *to what extent people with disabilities are dependent on assistive devices to participate in nature-based activities at travel destinations,*
- *what their needs for lending/renting such assistive devices are related to type of disability and age*
- *and whether partners in the ACCESSTOUR project inform about accessibility and available assistive devices at the travel destinations' website*

2. Materials and methods

2.1. Design

Drawing on a cross-sectional and multi-dimensional digital survey, this article presents selected findings regarding the need for and use of assistive devices in travel contexts. The survey was based on hypotheses and notions based on a previous qualitative study (Fabritius et al., 2023)

Table 2
Participant characteristics – type of disability and combinations of disabilities Number of observations, and per cent of total[a].

	Physical disabilities	Visual impairment	Hearing impairment	Intellectual disabilities	Other
In total	264 (100 %)	28 (100 %)	32 (100 %)	88 (100 %)	43 (100 %)
No other disability	190 (72 %)	1 (4 %)	6 (19 %)	23 (26 %)	17 (40 %)
Physical disability		19 (68 %)	23 (72 %)	48 (55 %)	15 (35 %)
Visual disability	19 (7 %)		11 (34 %)	15 (17 %)	5 (12 %)
Hearing disability	23 (9 %)	11 (39 %)		11 (13 %)	1 (2 %)
Intellectual disability	48 (18 %)	15 (54 %)	11 (34 %)		18 (42 %)
Other disability	15 (6 %)	5 (18 %)	1 (3 %)	18 (20 %)	

[a] Multiple answers possible.

and workshops including tourism operators during the ACCESSTOUR project (Antonsen et al., 2023). The multi-dimensional questionnaire included topics related to the entire customer journey; from planning the journey, through experiences while traveling, to returning home: travel habits – business and leisure travels, travel companions, travel frequency, preferences (rural-urban), experiences with information, booking solutions, transport and accommodation, need for assistive devices and information in general and concerning accessibility in particular. Participant characteristics, experiences of consistency between information and reality, as well as feedback and follow-up, were also requested in the survey.

2.2. Recruitment and data collection

The survey was distributed as a link via e-mail to 1190 current and former users of a rehabilitation center in a rural part of Norway, with one reminder. In addition, the Norwegian Federation of Organizations of Disabled People (FFO) sent the link to 21 of its member organizations with a request to forward the survey to their members. Four organizations reported that they had sent the survey to 1114 members. Thus, the survey was sent to 2304 people in total, and 330 people responded (14 %). Most of them (71 %) had a disability themselves, while 26 % responded on behalf of a child with disability, and 2 % responded on behalf of a child as well as on behalf of themselves.

2.3. Analysis

The results from the survey were analyzed with descriptive statistics including cross tables for relevant variables according to the aims of the study. Data were analyzed by using Statistical package of Social Sciences (IBM SPSS), version 27. Associations were tested with chi square tests. The level of significance was set to $p < 0.05$. The variables, type of disability and age were considered most relevant in line with clinical experience and former research (Darcy & Buhalis, 2011; Gjessing et al., 2022b). Age was categorized into four groups as presented in Table 1. Types of disability were categorized into five groups according to The World Health Organization's categories of disabilities, in addition to categories of combined disabilities as presented in Table 2.

A large number of tourism destinations in Norway have dedicated destination companies (destination management organizations) responsible for managing the destination's marketing, information and booking channels. These are often so-called "Visit" websites – such as Visit Norway at the national level or Visit Lofoten at a regional or local level. In this context, we examined the "Visit" websites of the four destinations involved in the ACCESSTOUR project. The aim was to investigate whether these websites provide information about accessibility for people with diverse disabilities regarding the possibility to participate in nature-based activities, and the availability of assistive devices for activity for loan or rent. Two of the authors systematically examined the websites to search for information on accessibility for wheelchair users, and accommodation for people with visual or hearing impairment, and people with intellectual disability. After conducting individual reviews, the two authors compared their findings and reached a shared consensus, which is presented in Chapter 3.4.

2.4. Ethics

The survey was approved by Norwegian Agency for Shared Services in Education and Research (NSD) (NSD ref number 693228). Participation was voluntary, and all participants were informed about the details of the study and how the data will be used before providing their informed consent. All the responses were anonymous. For participants in the study who were under the age of majority, their parents responded on their behalf. Given that the participants in the study can be considered a vulnerable group, the ethical guidelines outlined in the Declaration of Helsinki from the World Medical Association (WMA) (WMA, 2024) have been adhered to at all times.

3. Results

Participant characteristics are presented in Tables 1 and 2 The 330 respondents were categorized in age groups; under 19 years, 19–39 years, 40–59 years, and 60+ years.

Types of disability were categorized into physical, visual, hearing, intellectual, and other kinds of disability. The following table shows the age distribution by type of disability.

Several of the participants had more than one type of disability. This

Table 4
Responses to the question: Do you need individually adapted assistive devices at travel destinations? Presented by age group.

	<19 years	19–39 years	40–59 years	60+ years	Total
Yes	81 %	84 %	82 %	78 %	81 %
No	4 %	0 %	0 %	0 %	1 %
Sometimes	15 %	16 %	18 %	22 %	18 %
Total	100 %	100 %	100 %	100 %	100 %
N	72	63	101	94	330

Table 3
Responses to the question: Do you need individually adapted assistive devices at travel destinations? Presented by type of disability.

	Physical disabilities	Visual impairment	Hearing impairment	Intellectual disabilities	Other	Total
Yes	80 %	71 %	81 %	82 %	77 %	81 %
No	1 %	4 %	0 %	1 %	0 %	1 %
Sometimes	19 %	25 %	19 %	17 %	23 %	18 %
Total	100 %	100 %	100 %	100 %	100 %	100 %
N	264	28	32	88	43	330

Table 5
Responses to the question: Do you need to lend/hire assistive devices at travel destinations? Presented by type of disability.

	Physical disabilities	Visual impairment	Hearing impairment	Intellectual disabilities	Other	Total
Yes	11 %	7 %	16 %	6 %	5 %	9 %
No	60 %	71 %	63 %	74 %	70 %	65 %
Sometimes	30 %	21 %	22 %	21 %	26 %	26 %
Total	100 %	100 %	100 %	100 %	100 %	100 %
N	264	28	32	88	43	330

Table 6
Responses to the question: Do you need to lend/hire assistive devices at travel destinations? Presented by age group.

	<19 years	19–39 years	40–59 years	60+ years	Total
Yes	7 %	6 %	7 %	14 %	9 %
No	72 %	67 %	61 %	63 %	65 %
Sometimes	21 %	27 %	32 %	23 %	26 %
Total	100 %	100 %	100 %	100 %	100 %
N	72	63	101	94	330

is presented in Table 2, and thus, the categories are not mutually exclusive.

3.1. Assistive devices for daily living

The questions in Tables 3–4 examine the participants' need to use individually adapted assistive devices for daily living at travel destinations, and in Tables 5–6 whether they wanted to borrow or rent such equipment at the destination. The association between age and the four dependent variables was not statistically significant for any of the types of disability. Trivariate analyses combining age group, type of disability and the need for assistive devices are provided in a supplementary file, Table S1, Table S2, Table S3 and Table S4. A few associations were statistically significant, but due to many cells with very low n, these results do not add any important information. The types of disability seem to overrule age in most cases. The vast majority of the respondents reported that they needed individually adapted assistive devices, 81 % always and 18 % occasionally. Only one percent did not need individually adapted assistive devices and could use general mass-produced aids. Only eight percent responded that they always wanted to borrow or rent such aids at the travel destination, while 26 % needed it occasionally. In Norway, such aids are provided free of charge from NAV. The aids that the respondents needed to borrow or rent at the travel destination were primarily mobility aids and bathroom/toilet equipment, such as shower chairs, toilet seats, electric wheelchairs/scooters. In addition, a telecoil was often needed.

3.2. Assistive devices for sport and leisure activities

The questions presented in Tables 7–10 examine the need for assistive devices for sport and outdoor activities at the destination. To what extent are people dependent on using such aids in order to participate in various activities, and to what extent do they want to borrow or rent such aids at the destination?

As illustrated in Tables 7 and 8, 76 % responded that they needed individually adapted aids for sport and leisure activities, while 23 % needed such aids occasionally. This applies to aids such as sit-skis, special bicycles or tricycles and the like. The need for individual adaptation of the aids is also present when it comes to assistive devices for sport and outdoor activities. However, a clear difference emerges in the demand for renting such devices at travel destinations. Only 8 % needed to borrow or rent regular aids, whereas 72 % reported that they always wanted to rent assistive devices for sport and outdoor activities, and 27 % wanted to do so occasionally.

The results of the survey show that the target group has a strong need to rent adapted assistive devices for sport and outdoor activities in order to participate in their desired activities at travel destinations. Such equipment is not typically used in everyday life and is therefore not necessarily owned by individuals. Most of the respondents reported that they brought their own assistive devices for daily living, such as crutches, wheelchairs, hearing aids, or a white cane. However, they wanted to rent or lend assistive devices for sports and outdoor activities. The needs were greatest related to special bicycles, tricycles, boats and skiing equipment, such as toboggans and sit-skis. Information about accessibility was reported to be very important but often lacking.

3.3. Information needs

More than half (55 %) of the respondents answered that available information about assistive devices is important or very important to them. Only 33 % responded that they usually find sufficient information. However, only 17 % responded that there is usually a good consistency between available information on accessibility in general, and about the opportunity to borrow or rent assistive devices for activities of daily living or for sports and outdoor activities, and the actual conditions at the destination. There was no difference between the age groups regarding the importance and their need for specific information on accessibility.

Table 8
Responses to the question: Do you need individually adapted assistive devices for sport and leisure activities? Presented by age group.

	<19 years	19–39 years	40–59 years	60+ years	Total
Yes	68 %	73 %	77 %	84 %	76 %
No	3 %	0 %	0 %	0 %	1 %
Sometimes	29 %	27 %	23 %	16 %	23 %
Total	100 %	100 %	100 %	100 %	100 %
N	72	63	101	94	330

Table 7
Responses to the question: Do you need individually adapted assistive devices for sport and leisure activities? Presented by type of disability.

	Physical disabilities	Visual impairment	Hearing impairment	Intellectual disabilities	Other	Total
Yes	77 %	79 %	84 %	73 %	70 %	76 %
No	0 %	4 %	0 %	0 %	0 %	1 %
Sometimes	23 %	18 %	16 %	27 %	30 %	23 %
Total	100 %	100 %	100 %	100 %	100 %	100 %
N	264	28	32	88	43	330

Table 9
Responses to the question: Do you need/use to hire assistive devices for sport and leisure activities at travel destinations? For example, ski equipment, bikes etc. Presented by type of disability.

	Physical disabilities	Visual impairment	Hearing impairment	Intellectual disabilities	Other	Total
Yes	73 %	79 %	81 %	69 %	63 %	72 %
No	1 %	7 %	3 %	2 %	0 %	1 %
Sometimes	26 %	14 %	16 %	28 %	37 %	27 %
Total	100 %	100 %	100 %	100 %	100 %	100 %
N	264	28	32	88	43	330

Table 10
Responses to the question: Do you need/use to hire assistive devices for sport and leisure activities at travel destinations? For example, ski equipment, bikes etc presented by age group.

	<19 years	19–39 years	40–59 years	60+ years	Total
Yes	68 %	64 %	72 %	80 %	72 %
No	4 %	0 %	1 %	0 %	1 %
Sometimes	28 %	37 %	27 %	20 %	27 %
Total	100 %	100 %	100 %	100 %	100 %
N	72	63	101	94	330

3.4. Results from the information mapping

The review of the travel destinations' websites showed that one of four destination websites had a clear accessibility guide that covered accessibility in general, also all the activities in the area were structured based on the "customer journey" model. On another destination's website, specific search for "accessibility" was necessary to find information about certain places and activities that were accessible for wheelchair users to varying degrees. There was no information to be found about accessible accommodation for people with other disabilities. The remaining two destination websites stated that destination management organizations were collaborating with the ACCESSTOUR project to improve accessibility in the future. However, one of them featured a customer story describing a wheelchair user's journey in the area.

3.5. Summary of results

Across disability types, daily living aids are widely needed but rarely sought for rental, while sport/activity aids are both needed and frequently requested for rental. Age was not a significant factor in the analysis; therefore, results are presented by disability type. See Fig. 1. Main barriers reported include limited physical access, attitudes, and lack of reliable information (only 17 % reported consistency between information and on-site conditions). A supplementary website scan showed that only one out of four destination websites provided a comprehensive accessibility guide.

4. Discussion

This study explored needs for, availability of, and information concerning assistive devices when traveling among persons with disabilities, with the aim of gaining a better understanding of how participation in accessible nature-based activities for all can be supported. The types of disability include conditions such as cerebral palsy, autism, Downs syndrome, stroke, multiple sclerosis, spinal cord injury, and neuromuscular diseases, in addition to diverse degrees of visual and hearing impairments. Some of these conditions have combined physical, sensory

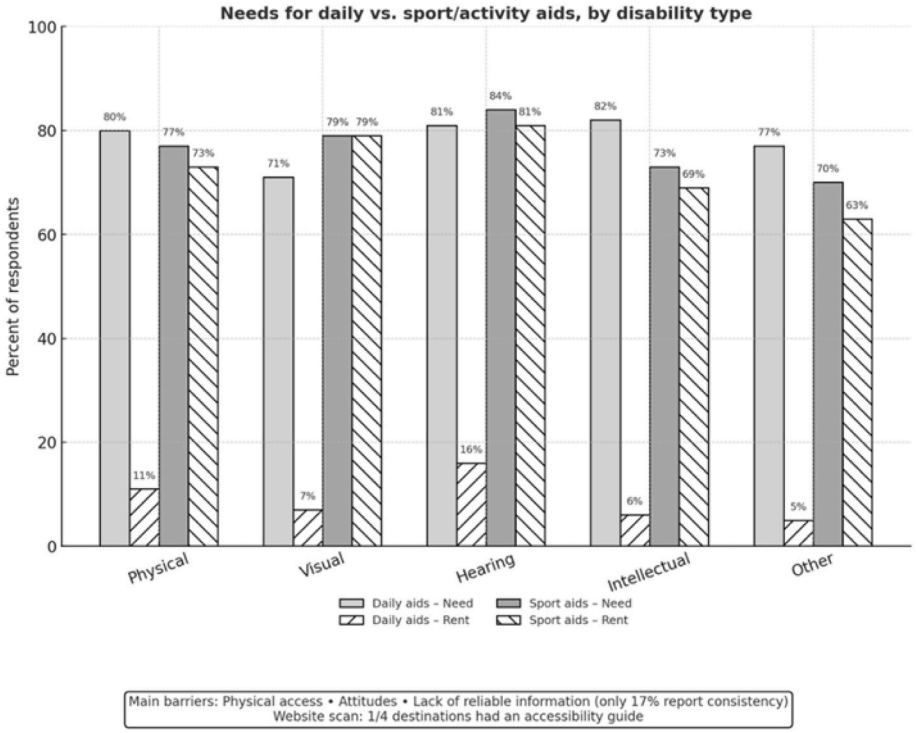

Fig. 1. Synthesis of needs and main barriers for accessible nature-based activities, organized by disability type. Grey bars indicate "Needs", hatched bars indicate "Want to rent".

and cognitive impairments, and thus are in need of individually adapted assistive devices and adapted information.

4.1. Discussion of results

According to the "Guide on rehabilitation, habilitation, individual plan and coordinator" (The Norwegian Directorate of Health, 2018), the municipality is responsible for the provision of necessary aids, and for facilitating the environment around the individual user. This applies to all stages of the provision process, including applying for funding, procurement, individual adaptation, training in use of the equipment, and service and repairs. The municipality is also responsible for evaluation and follow-up on the need for changes. This responsibility applies whether the assistive device is to be used in the home, at school, at work, or during leisure time (ibid). These schemes probably contribute to the fact that most people bring the necessary assistive devices for daily use when they are traveling.

Assistive devices for activity are often prerequisites for participating in sports and nature-based activities (Aasan, 2020; Bergem, 2012; Gjessing et al., 2017, 2021). Unlike assistive devices in daily life, assistive devices for sport and outdoor activities are not available in the same way in Norway. As mentioned earlier, only children and youth up to 26 years of age are provided with such devices free of charge (NAV, 2015). Therefore, there is a greater need to borrow or rent such equipment at travel destinations.

Figueiredo et al. (2012) question whether tourist destinations are prepared to accommodate the needs of persons with disabilities regarding the need for assistive devices. Even if enabling individuals with disabilities to participate in preferred activities – together with, and on equal terms with, non-disabled individuals – has a positive impact on their quality of life and enhance their participation across multiple areas of life (Buhalis & Michopoulou, 2011; Figueiredo et al., 2012; Kastenholz et al., 2015).

However, research shows that the competence of local service providers is often lacking when it comes to adaptation and training in the use of assistive devices for sport and outdoor activities (Bergem, 2018, 2020; Gjessing et al., 2022a). It is therefore important that tourism destinations that offer rental of such equipment have instructors with the necessary competence or collaborate with professionals who have the necessary competence in adaptation and training in the use of such equipment. Research also shows that children find such devices cool, and they are happy to use them even if they look different from the equipment of their peers (Gjessing et al., 2017). Many build an identity around these special devices (Pedersen et al., 2019a). Assistive devices for sport and outdoor activities may give persons with a disability the opportunity to participate in an activity they really want to, and even sometimes experience mastery through being ahead of their peers in attractive activities (Gjessing et al., 2022b; Pedersen et al., 2019b).

According to Darcy (2010) and Groulx et al. (2024), there are several gaps in how to understand accessible tourism that need to be further explored. One of those gaps is to define and ensure the benefits of experiences and activities for all. They also call for the investigation of visitors' expectations and perspectives, an area to which this study has contributed. To enable people with a wide range of disabilities to fully participate in nature-based activities, it is important to focus on program accessibility, how the activities are structured, and how they are made accessible (Burns et al., 2009). The lack of objective research and data related to identifying barriers to participation in nature-based activities poses a challenge to facilitating inclusive access for everyone (Groulx et al., 2024; Packer et al., 2007).

5. Conclusions

The results showed that a large number of persons with disabilities need assistive devices both in activities of daily life and in sports and outdoor activities, thus also when traveling. Most of the participants brought their own individually adapted assistive devices for daily life with them when traveling. However, they expressed a desire to rent or lend assistive devices to participate in sports and outdoor activities. Information about available assistive devices is crucial when choosing a travel destination, yet such information is often lacking. Travel destinations are therefore advised to map their own accessibility, conduct necessary adjustments, and inform precisely about the conditions on their websites and other information platforms. Increased accessibility to tourist destinations will be a win-win situation, as the destinations will not miss out on a potentially large customer base and, not least, will contribute to making nature-based experiences accessible to all.

5.1. Strengths and limitations

This article presents selected findings of the first large scale quantitative study on Accessible Tourism in Norway. Thus, it represents an important contribution towards filling knowledge gaps that can support a more inclusive and accessible tourism in a Norwegian context, with potential transfer value to other contexts. However, the study has some limitations regarding the survey itself. First, the response rate was relatively low, around 14 %. This limits the possibility of generalization of the results, but a strength is that persons with diverse disabilities, related to mobility, vision, hearing and cognition were represented among the respondents. Second, the respondents were not asked to report their sex or the county of residence. This decision was based on a concern that the questionnaire was very comprehensive, but most importantly to ensure anonymity. Only four destination websites were investigated about information on accessibility, thus, these findings on limited information cannot be generalized to other destination websites.

5.1.1. Implications for future practice

Based on the generated knowledge presented in this article, travel destinations in rural areas are advised to provide assistive devices for sports and outdoor activities along with general equipment, such as bikes, alpine skis and snowboards. Collaboration with competence centers on adaptation and training in the use of the devices is recommended. Given the limited and seasonal use of many assistive devices for outdoor recreation, such as sit-skis, which may only be used during a single winter week each year, facilitating access through loan and reuse schemes becomes particularly important. To allow for more universally designed services and environments, nature-based travel destinations are also advised to provide specific information about accessibility on their websites to increase the potential of nature-based experiences for all.

5.1.2. Implications for further research

The results of this study indicate the need to develop, test, and implement a mapping tool for tourist destinations and companies to assess their own accessibility. To meet the information needs, development, testing and implementation of an accessibility guide to be used on the websites of the tourist destinations and companies is required. It is also desirable to investigate arrangements for making assistive devices for sports and outdoor activities available for loan and reuse.

Author contributions

Tor Erik Heyerdahl Nyquist: interpretation of results, writing original draft, review and editing. **Reidun Birgitta Jahnsen:** conceptualization, interpretation of results, writing-review and editing, supervision. **Trond Bliksvaer:** conceptualization, statistical analyses, interpretation of results. **Ana Koncul:** interpretation of results, writing-review and editing, supervision. **Karin Marie Antonsen:** conceptualization, interpretation of results, writing-review and editing, supervision.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jort.2025.100982.

Data availability

Data will be made available on request.

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