



Research Article

Comparison of Physical Activity between Children and Adolescents with and without Disabilities in Finland

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Abstract

Aim: To compare physical activity between children and adolescents with and without disabilities in Finland.

Materials and Methods: We use two materials: a separate sample of children and adolescents with disabilities and a basic sample of the Finnish Leisure Study for Children and Adolescents from 2018. A separate sample (n = 152) was collected by sending a questionnaire to 500 adolescents with disabilities. We limited the data to 13-17-year-olds (n = 303). We combined a basic sample of the study material (n = 241) with a separate sample (n = 62) of adolescents with disabilities. Method is a quantitative survey analysis.

Results: The main finding of our study is that adolescents with disabilities engage in less physical activity than adolescents without disabilities in the 13-17 age groups. The physical activity of adolescents with disabilities compared to the corresponding physical activity parameters of adolescents without disabilities explains, on the one hand, the differences in physical activity between these groups as social situations and on the other hand the motivational factors of physical activity.

Conclusions: In the context of the UN CRPD definition of disability, the study reinforced the notion of the changing meaning of disability in different contexts. In some cases, the disability played a role in relation to social situations in exercise and in some cases did not. Examining the physical activity of people with disabilities reveals the conditions for participating in physical activity: which promote and which restrict or reduce participation in physical activity.

Keywords: Children and adolescents; Disability; Physical activity

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Introduction

The biennial data collection of the Leisure Survey for Children and Adolescents in Finland was extended in 2018 to include children and adolescents with disabilities. This was done by picking up people with disabilities aged 7-17 from the Finland's Social Insurance Institution's registry and disseminating a social media link to a questionnaire targeting children and adolescents with special needs aged 7-17. The responses obtained through these two data collection methods represent a group of children and adolescents with disabilities in the study. Obtaining such a sample can be difficult because perceptions and definitions of what is a disability or disability are heterogeneous, and different definitions emphasize slightly different issues [1-4]. The UN Convention on the Rights of Persons with Disabilities, which entered into force in Finland in 2016, defines disability as a medically understandable condition that can cause functional disability, but at the same time it is a phenomenon that is constantly being redefined in interactions and contexts, societies and cultures. In this way, the UN Convention on Disability emphasizes the relationship between disability and its environment. In the leisure study of children and adolescents, the definition of disability was based on the disability registry data of the Social Insurance Institution.

We are motivated to do comparative research between people with and without disabilities because people with disabilities are most often excluded from nationwide population surveys. Even if people with disabilities are included in the sample, they cannot be identified and the results are not reported from this perspective. Studies on people with disabilities are usually conducted within a disability group, and the results are often not comparable to studies on the general population. And this is also evident in the Leisure Survey for Children and Adolescents in Finland: children and adolescents with disabilities are only included in a separate sample and were not included in the original study.

Our starting point in the article is the emphasis of the UN Convention on Disability on the relationship between the phenomenon of disability and its environment. We look at and compare the physical activities of children and adolescents with disabilities results from a basic sample of the Leisure Survey for the same age group. The samples selected for the examinations generally exclude persons with different types of disabilities, such as those in institutions or service housing [5-7]. The living conditions of people with disabilities have generally been studied solely by different disability groups, and their own indicators have been developed for these studies. Then comparisons with the rest of the population have been impossible. In this study, at least a partial comparison between disabled and other children and adolescents is possible because the questionnaire for adolescents with disabilities contained partly the same questions as the basic sample questionnaire for children and adolescents.

Studies of physical activity among children and adolescents with disabilities and functional limitations in their own groups have often focused on the connection between physical activity and quality of life [8,9], access to physical activity [10], adverse health effects of

immobility and marginalization from communities [11]. Comparative studies have often focused on health inequalities, and subjects' own experiences of their lives have been neglected. However, sociologically oriented studies comparing people with disabilities with the rest of the population have looked at social networks [12] and social capital [13], among others. In Europe, one of the most comprehensive databases comparing the situation of people with disabilities with the rest of the population in statistics is the European Union's SILC, which is constantly updated. Its statistical data is not specifically designed for research purposes, but it does reveal the gap between people with disabilities and the rest of the population, and can serve as a basis for building more differentiated comparative research approaches.

Materials and Methods

In this article, we use two materials: a separate sample of children and adolescents with disabilities and a basic sample of the Finnish Leisure Study for Children and Adolescents from 2018. A separate sample (n = 152) was collected by sending a questionnaire to 500 adolescents with disabilities. In addition, a link to a questionnaire on the website of the Youth Research Network, targeting children and adolescents aged 7 to 17 in need of special physical activity support, was distributed in social media. The survey was distributed in collaboration with, among Finnish disability associations: the ADHD Association, the Autism and Asperger's Union, the Association for the Disabled, the Hearing Association, the Parents' Association for Deaf Children, the Deaf Association, the Threshold Association, the Finnish Adapted Physical Activity Federation and the Vamlas Foundation. Both surveys were based on the same set of questions. The method of collecting the basic sample of children and adolescents' leisure time research (n = 1599) is presented in their own report [14].

In our analysis, we limited the data to 13-17-year-olds (n = 303). We combined a basic sample of the study material (n = 241) with a separate sample (n = 62) of adolescents with disabilities. A preliminary analysis we found that the question "How important is it for you to not exercise is because you have a disability or illness that makes it more difficult to exercise?" was answered by 11 of the sample participants as "very significant". These 11 adolescents were included in the group of adolescents with disabilities. However, it is quite possible that more adolescents with some disability or long-term illness have been included in the basic sample, but they do not feel that it is a hindrance to their physical activity. However, it is impossible to identify these adolescents from the data because the study did not ask them any disability questions.

Therefore, this dataset, which covers 13-17 year olds, has 73 (24%) adolescents with some kind of disability, and 230 (75%) adolescents without disabilities (Table 1). When we wanted to compare the physical activity of children and adolescents with disabilities and the basic sample of children and adolescents and related factors, we had to make sure that the same age group was used in the comparison, and that the desired variables had the same names and definitions.

	Adolescents with disability	Adolescents without disability	Total
Girl	34 (46.6%)	114 (49.6%)	148 (48.8%)
Boy	38 (52.1%)	114 (49.6%)	152 (50.2%)
Other	1 (1.4%)	2 (0.9%)	3 (1.0%)
Total	73 (100%)	230 (100%)	303 (100%)

Table 1: Disability and gender of the respondents.

Our data was analyzed by using cross-tabulations and Chi-square tests. This was done because the nature of the data and to demonstrate the group differences in a concrete way. In initial analyses also one-way ANOVA was used.

Functional limitations

Adolescents with disabilities were asked 11 questions about functional limitations (these questions were not asked to adolescents without disabilities). Based on these issues, disability was addressed through four areas:

- Physical limitation: Much difficulty or inability to function at least in one of the basic functional dimensions: seeing, hearing or walking
- Problems taking care of themselves: Much difficulty or inability to take care of themselves
- Cognitive limitation: Much difficulty or inability to function with at least one basic functional dimensions: remembering things, learning new things, or focusing
- Social limitation: Much difficulty or inability to work with at least one basic functional dimensions: accepting changes, controlling one's behavior, getting friends

There was also a question related to the communication: "Do you have difficulties in being understood when you speak?" A lot of difficulties or not understood at all.

	n (Total= 73)	%
Physical limitations	9	14.5
Self-care problems	10	16.1
Cognitive limitations	28	45.2
Social limitations	24	38.7
Communicative limitations	16	25.8
None	25	40.3

Table 2: Functional limitations among adolescents with disabilities.

40% of adolescents with disabilities estimate that they have no severe disabilities. This means that by using such questions and definitions, respondents with disabilities or long-term illnesses cannot be uniquely identified in the data. On the other hand, many had reported that they had severe disabilities in more than one area of disability. Based on this, it is not possible to divide the disabled adolescents into groups according to the quality of the disability in the data and thus to make comparisons between the disability groups.

Comparison of physical activity between children and adolescents with and without disabilities

Participation in physical activity is often not the same in different population groups. These differences have often been analyzed in the research literature from the perspective of equality within the framework of social structure and gender inequality [15]. For example, the World Health Organization (WHO) identifies social and cultural causes that limit women's physical activity as factors that create inequality and disadvantage for women. It can also be argued that equality of physical activity as measured results is a misleading goal because it does not necessarily take into account various factors that influence physical activity, such as ability to act, readiness to act, and contextual meanings [16].

Although we have compared the responses of adolescents with and without disabilities about their exercise or physical activity, we realize that the comparative setting alone does not indicate that adolescents with disabilities are often less likely to have poor physical fitness or physical or cognitive barriers to achieving age-appropriate physical performance. Rather, our analysis seeks to explore the social, cultural, and agency-related causes among adolescents with disabilities compared to adolescents without disabilities.

Physical activity

The adolescents were asked “Are you doing any physical activity right now?” And the answer options were: 1 = Yes, 2 = No and 3 = Cannot say. Answers 2 (No) and 3 (Cannot say) were combined (“Cannot say” had answered only two persons in each group). (See Table 3).

	Adolescents with disability	Adolescents without disability	Total
No physical exercise	15 (20.5%)	18 (7.8%)	33 (10.9%)
Physical exercise	58 (79.5%)	212 (92.2%)	270 (89.1%)
Total	73 (100%)	230 (100%)	303 (100%)

Chi square: 9.24, p<.01

Table 3: Physical exercise of adolescents with and without disabilities.

The result is similar to that of the 2016 “Lifestyle Exercise Behavior in Children and Adolescents in Finland” (LIITU) [17], which compared physical activity, membership in a sports club and sitting time between adolescents with disabilities and without disabilities. In the LIITU study, adolescents aged 11-15 were asked to report functional limitations they experienced. In addition, the study investigated the links between functional limitations and physical activity, sports club activities and sitting. About 15% of adolescents reported experiencing a functional limitation. Of the various functional limitations, physical activity is most affected by mobility problems [18].

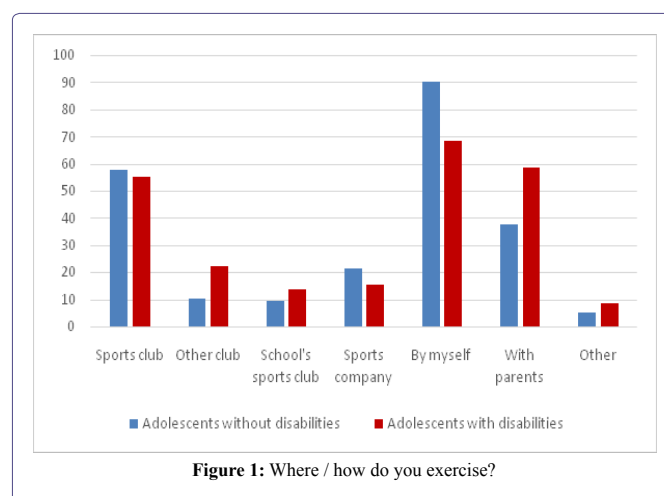
The physical activity of people with disabilities has been studied a lot around the world. The central finding of these studies is that physical activity contributes to the health and general well-being of physically disabled people in particular, since they are otherwise most immobile [8,19,20]. However, a simple comparison between people with and without disabilities as to whether or not the informant who responded to the survey is engaged in physical activity is not built. This basic question is often accompanied by a review of exercise frequencies, effectiveness and duration over a longer period of time. Methodologically, however, the basic question produces a basic set of people who exercise and not exercise. The groups thus formed can be used to further analyze issues related to exercise or non-exercise.

Results

Division of exercise places and practices

The division of exercise places and practices among exercise sessions was asked by seven questions (see Figure 1). For each question about the way / location of the hobby, the answer options were 1 = Daily or almost daily, 2 = Few times a week, 3 = About once a week, 4 = About every month or less, 5 = Never. We summarized the classification into two classes: 1 = Exercise regularly on a weekly basis (options 1-3) and 2 = Less frequently or never (options 4 and 5). Both adolescents with and without disabilities practiced physical activity

on their own (see Figure 1). After that, the most popular places and practices for hobbies were the Sports Club and hobbies with parents. There were statistically significant differences between adolescents with and without disabilities at three points. The clearest difference was in voluntary exercise (Chi square: 17.66, p <.001). While almost all (90%) of adolescents without disabilities reported on their volunteer physical activity, only over two-thirds (68%) of adolescents with disabilities volunteered. Adolescents with disabilities were more likely to engage in physical activity with their parents (Chi square: 8.14, p <.01) and somewhere outside of the sports club (Chi square: 5.85, p <.05) than adolescents without disabilities.



Statistically significant differences between groups of adolescents with and without disabilities in volunteering, with parents and non-sports club activities may be due to the availability and accessibility of sports facilities and sports clubs. Adolescents with disabilities exercise voluntarily less than adolescents without disabilities, but with parents and other people they exercise more than adolescents without disabilities. Self-developed physical activity is a success, parents may play a role in assisting with physical activity, and sports clubs may not be able to engage in activities that are suitable for the disabled. This question has therefore been one of the major dilemmas in the development of specialized exercise. Aija Saari [21], in her doctoral dissertation, highlighted the tensions between special sports for children and adolescents and the ideology of inclusion. Such tensions were evident between the special activity and the general activity of the club, both for the organizers and for the participants or the parents. Tensions emerged that general sports club activities may not have invested sufficiently in key sports activities such as low-threshold club activities, subsidiary or applicability of performance, sufficient reciprocal information, and organizational leadership support. Based on these results, a picture of barriers and incentives for inclusion was drawn. The fundamental role of special physical activity as an enabler of inclusive practices also took on a new role when general sports club activities were able to implement forms of special physical activity.

Exercise motivation

The motivating factors for exercising were asked with 15 questions, each with the following alternatives: 1 = Not at all important, 2 = Somewhat important, 3 = Very important, 4 = Cannot say. In our analyse, we summarised these alternatives in two categories: 1 = Very

important, 2 = Somewhat important / Not important / I Cannot say. Thus, only those adolescents who engage in physical activity have answered these questions. The most common reasons for exercising were the pleasure of exercising, staying fit, gaining success, and developing yourself (see Figure 2). Six statistically significant differences were observed between adolescents with and without disabilities. Adolescents without disabilities were more likely to report as motivating factors for self-development (Chi square: 13.95, $p < .001$), good fitness (Chi square: 6.73, $p < .01$), weight control (Chi square: 5.33, $p < .05$) and hanging out with friends (Chi square: 4.10, $p < .05$). Adolescents with disabilities reported more frequently their motivation to become a professional (Chi square: 11.48, $p < .001$) and their desire to win (Chi square: 5.39, $p < .05$).

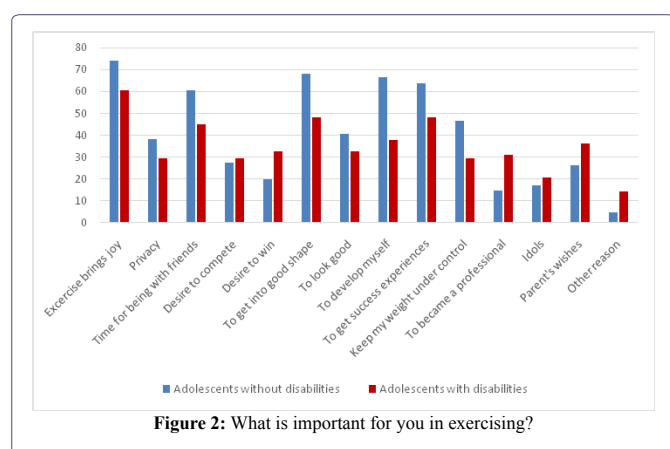


Figure 2: What is important for you in exercising?

In a systematic literature review of the meaning of leisure for physically disabled children and adolescents [22], where 2/3 of the selected studies dealt with physical activity, joy, fulfillment, freedom, and friendship were also key motivational factors. Joy meant pleasure and happiness, achievement / to-do development and expression of competence and identity, freedom of choice and freedom from limitations, and friendship and family together and acceptance. These results are in line with the results of our own research on the most important motivational factors for exercise. Especially pleasure, staying fit [22] and friendship were important motivation factors. The results of the leisure and sport exercise survey broadly shed light on the social status of people with disabilities: they explain the impact of disability on self-awareness, self and body and highlight the benefits of participation in physical activity, its impact to get over disability barriers, to participate and to improve communality [23]. In developing social and health services to make them more accessible to people with disabilities, the same themes have been explored in the framework of International Classification of Functioning, Disability and Health (ICF) [24,25].

Physical inactivity

The reasons for not exercising were asked with 18 questions. The answer options were: 1 = Not at all significant, 2 = Somewhat significant, 3 = Very significant and 4 = Cannot say. Again, the answer options were summarized in two categories: 1 = Very significant and 2 = Somewhat significant or not significant and I cannot say. All respondents who did not exercise and had answered at least one point other than “Cannot say” (n = 20) were included. Due to the small number of respondents, statistical tests are not reliable, so the tabulated data are mainly for descriptive purposes.

All in all, adolescents with disabilities reported more reasons for non-physical activity than adolescents without disabilities (see Table 4). The most frequently reported causes were poor experiences with school exercise, coaching and physical activity in general, as well as fear of not being accepted or doing well.

	Adolescents with disabilities (n=12)	Adolescents without disabilities (n=8)	Total (n=20)
Does not like physical exercise	4 (33.3%)	0 (0.0%)	4 (20.0%)
Exercise is not useful	5 (41.7%)	1 (12.5%)	6 (30.0%)
No time for exercise	5 (41.7%)	2 (25.0%)	7 (35.0%)
Disability or disease prevents	6 (50.0%)	0 (0.0%)	6 (30.0%)
Too competitive	4 (33.3%)	0 (0.0%)	4 (20.0%)
Too expensive	6 (50.0%)	1 (12.5%)	7 (35.0%)
Bad experiences from school exercise	9 (75.0%)	0 (0.0%)	9 (45.0%)
Bad experiences of coaching	8 (66.7%)	0 (0.0%)	8 (40.0%)
Bad experiences in general	8 (66.7%)	0 (0.0%)	8 (40.0%)
No guided exercise available	4 (33.3%)	0 (0.0%)	4 (20.0%)
Not physically gifted	3 (25.0%)	0 (0.0%)	3 (15.0%)
No knowledge about the sites	8 (66.7%)	1 (12.5%)	9 (45.0%)
Possibilities for exercise are too far from home	7 (58.3%)	0 (0.0%)	7 (35.0%)
No hobby mate	5 (41.7%)	1 (12.5%)	6 (30.0%)
No coach	6 (50.0%)	0 (0.0%)	6 (30.0%)
Fear of not doing well	7 (58.3%)	2 (25.0%)	9 (45.0%)
Fear of not being accepted	9 (75.0%)	2 (25.0%)	11 (55.0%)
Other reason	0 (0.0%)	0 (0.0%)	0 (0.0%)

Table 4: Reasons for inactivity in groups of adolescents with and without disabilities.

Although the margin of error for such a small number of respondents (n = 20) is large, since repeating the same question to new respondents could result in significant differences, thematically the same causes of physical inactivity among adolescents with disabilities have been found in other studies. In a systematic literature review, [9] categorized environmental and personal factors as causes of inactivity with disabled children and adolescents. These were linked to individuals’ functional ability, forms of physical activity and participation. It would be possible to classify the results of our own research in the same way and build a more accurate research setting on non-exercise. The small questionnaire data available for reasons of non-exercise may serve mainly as an indicative pilot for further research.

Bullying and inappropriate treatment in exercise

Adolescents were asked the question: “Have you ever experienced bullying, discrimination or other inappropriate treatment in your physical activity?”. For adolescents without disabilities the answer options were: 1 = None, 2 = Yes, sometimes, 3 = Yes, often and 4 = Cannot say. For disabled adolescents, the answer options were: 1 = None, 2 = Yes, often, 3 = Yes, sometimes and 4 = Cannot say. The categorization was summarized by combining classes 2 and 3, that is, those who had experienced bullying or inappropriate treatment at least sometimes and classes 1 (not at all) and 4 (I cannot say).

More than one in two (57%) of adolescents with disabilities reported having experienced bullying during exercise, while less than one fifth of adolescents without disabilities (17%, see Table 5).

	Adolescents with disability	Adolescents without disability	Total
Not experienced	27 (43.5%)	192 (83.5%)	219 (75.0%)
Has experienced sometimes or often	35 (56.5%)	38 (16.5%)	73 (25.0%)
Total	62 (100%)	230 (100%)	292 (100%)

Chi square: 41.50, p<.001

Table 5: Experiences of bullying and inappropriate treatment in exercise

There has been much research on bullying and inappropriate treatment of people with disabilities, in particular violence and sexual abuse against people with disabilities. Based on the results of the Finnish School Health Survey 2008-2017 of the National Institute for Health and Welfare (THL), it appears that functional limitation or disability among adolescents is one of the main causes of bullying and discrimination [26]. Comparison of bullying between adolescents with and without disabilities has not been made in this report, but it is expected that adolescents with disabilities are more likely to be bullied and discriminated against than adolescents without disabilities, as adolescents with disabilities are one of the four most bullied group. Other groups that are most bullied include adolescents with a foreign background, placed adolescents and adolescents whose mothers have a low education level.

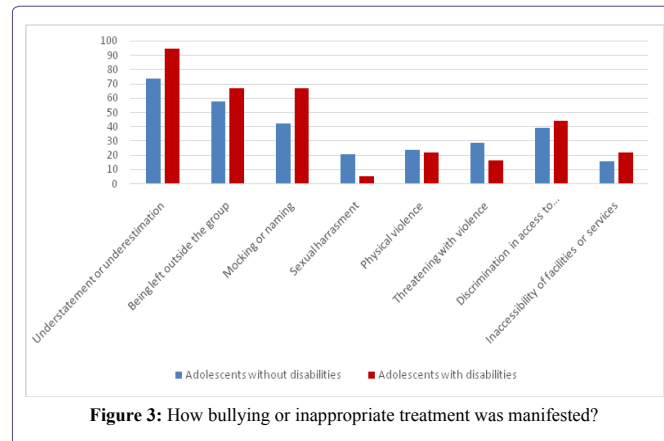
The appearance of bullying and inappropriate treatment

The survey asked eight questions about how the bullying/inappropriate treatment was manifested. For adolescents without disabilities, the answer options for all questions were: 1 = None, 2 = Yes, sometimes, 3 = Yes often. For adolescents with disabilities, the options were: 1 = Yes, often, 2 = Yes, sometimes, 3 = None. The response options were aligned with the study of adolescents without disabilities and the categories ‘Yes often’ and ‘Yes sometimes’ were combined. A total of 56 adolescents had answered these questions, meaning that not all adolescents who had experienced bullying and inappropriate treatment had answered them.

Most often, adolescents had experienced understatement, understatement, exclusion, mocking and naming (see Figure 3). These forms of bullying and inappropriate treatment were also more common in the group of adolescents with disabilities, but the differences between the groups were not statistically significant due to the small number of respondents.

A study [27] on discrimination experienced by children and adolescents also identified forms of discrimination faced by children and adolescents with disabilities. The most common experiences of children and adolescents with functional limitations or disabilities in discrimination were naming, prejudice and exclusion. In practice, the same themes of bullying and inappropriate treatment become significant experiences in our study of adolescents with disabilities. Comparing the experiences of bullying and inappropriate treatment of adolescents with and without disabilities, it can be noted that although adolescents without disabilities experience less bullying and

inappropriate treatment, but the trends of bullying and inappropriate treatment are quite similar, except in the cases sexual harassment and threats of violence.



Conclusions

The main finding of our study is that adolescents with disabilities engage in less physical activity than adolescents without disabilities in the 13-17 age group. The result as such is not surprising when it is likely that the disability causes physical and cognitive barriers and limitations to exercise.

The difference in the measured variables describing the physical activity of adolescents with disabilities compared to the corresponding physical activity parameters of adolescents without disabilities explains, on the one hand, the differences in physical activity between these groups as social situations and on the other hand the motivational factors of physical activity. Statistically, adolescents with disabilities engage in physical activity more often on their own and with their parents and in clubs other than sports clubs. This may mean that participation in peer life is lower for adolescents with disabilities than for adolescents without disabilities.

Comparison of the motivation factors of physical activity also supports this interpretation. For adolescents without disabilities as a motivator for physical activity, time with friends, good fitness and self-development are statistically more significant than for adolescents with disabilities. For adolescents with disabilities, the motivation factors for “momentum to win” and “professionalism” that may be associated with momentary pleasure are statistically more significant than for adolescents without disabilities. In our comparison, non-exercise also appears different in these groups.

Adolescents with disabilities experienced more bullying and inappropriate treatment than adolescents without disabilities, but the experiences of bullying were almost similar. In the context of the UN CRPD definition of disability, the study reinforced the notion of the changing meaning of disability in different contexts. In some cases, the disability played a role in relation to social situations in exercise and in some cases did not. Examining the physical activity of people with disabilities reveals the conditions for participating in physical activity: which promote and which restrict or reduce participation in physical activity.

Further research could be on the structural and individual level studies of physical activity. Structural factors may include the conditions for access to physical activity, such as the available physical exercise facilities and equipment, assistants and appropriate times. Individual level research on physical activity could focus more specifically on inclusion and participation as well as on economic issues.

As a separate sample, the survey of adolescents with disabilities based on register data and social media can serve as a separate study only. More comprehensive comparative approaches on leisure time for people with and without disabilities could also be developed for research data. Clearly, a functional limitation categorization question fails to identify people with disabilities from the questionnaire, since people with disabilities may feel they have no any functional limitations. We also found this in this study. Therefore, people with disabilities should be included in various national surveys, and disability issues should be included in the questionnaires. Leisure research for adolescents could include disability questions, or alternatively, based on population register data, the same or applied questionnaire could be conducted with adolescents with disabilities as well as with non-disabled adolescents.

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Journal of Brain & Neuroscience Research
Journal of Cancer Biology & Treatment
Journal of Cardiology: Study & Research
Journal of Cell Biology & Cell Metabolism
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