

## **How to succeed? Physical activity for individuals who are blind**

Audun Brunes, MSc<sup>1</sup>, Eli Krokstad, MSc<sup>2</sup> and Liv Berit Augestad, PhD<sup>1,2</sup>

<sup>1</sup> Department of Neuroscience (INM), Faculty of Medicine, Norwegian University of Science and Technology (NTNU)

<sup>2</sup> Department of Visual Impairments, Statped midt, Melhus, Norway

Corresponding author:

Audun Brunes, Department of Neuroscience, Faculty of Medicine, Norwegian University of Science and Technology (NTNU), NO-7491 Trondheim, Norway.

E-mail: [audun.brunes@ntnu.no](mailto:audun.brunes@ntnu.no)

## **Abstract**

The aim of our case study was to examine the perceived experiences of participation in physical activity (PA). The cases comprised two individuals with blindness (a girl aged 12 years and a man aged 23 years), both of whom lived in Norway and had succeeded in becoming physically active. Both participants were recruited from Statped, the Norwegian support service for special needs education. Data were gathered from individual structured interviews with open and closed questions. A narrative descriptive analysis was used to analyse the data. The results showed that important factors for the blind participants' PA participation were having good instructors, support or visual interpreters, active family members, a safe sports environment, having tried many sports, private transportation to the exercise facilities, and a positive social environment, with peers, friends and family members. Although some differences were found between the participants' responses, important reasons for them to engage in PA were stated as the sense of fun, energy and self-esteem that they derived from it, in addition to physical fitness. In conclusion, the study provides knowledge of factors that could increase PA adherence of individuals with blindness being included in PA and sports together with sighted peers.

## **Keywords**

Barriers, children, facilitators, physical activity, structured interview, sports, blindness

## **Introduction**

In Scandinavia, the prevalence of blindness has been estimated as 0.15–0.41 per 1000 children in the age group < 17 years (Kocur & Resnikoff, 2002) and 2 per 1000 adults in the age group 20 to 84 years (Buch et al., 2004). Three categories of blindness are operated with in the tenth revision of the International Classification System of Diseases (ICD-10): one with visual acuity in the interval from 3/60 to 20/1200, the second with acuity from 20/1200 to light perception, and the third with no light perception. This means that by using the term blindness one might find persons with some sort of residual vision or persons with total blindness (World Health Organization, 2011). Most children and young adults with blindness experience delays in the development of their motor, cognitive and communication abilities compared with their sighted counterparts (Lieberman, Ponchillia, & Ponchillia, 2013), as well as an increased risk of being overweight (Montero, 2005), having lower physical fitness (Augestad & Jiang, 2015) and having one or more chronic conditions (Rahi & Cable, 2003).

For children and young adults with blindness, physical activity (PA) could play an important role in promoting their somatic and mental health (Ackley-Holbrook, Kang, & Morgan, 2016; Brunes, Flanders, & Augestad, 2015; Holbrook, Caputo, Perry, Fuller, &

Morgan, 2009) as well as improving their functioning, social involvement and health-related quality of life (Gronmo & Augestad 2000; Haegele, Famelia, & Lee, 2016; Oh, Ozturk, & Kozub, 2004). In order to maintain functioning and health, the World Health Organization (WHO) recommends that all should engage in moderate to high intensity aerobic PA of at least 60 minutes per day for children and of at least 150 minutes per week for adults (World Health Organization, 2010). However, most individuals with visual impairments and blindness do not meet these PA guidelines (Houwen, Harman, Visscher, 2009; Kozub & Oh, 2004). Moreover, it has been found that children and adults with visual impairments or blindness have lower PA levels (Augestad & Jiang, 2015), fewer leisure-time activities (Engel-Yeger & Hamed-Daher, 2013; Houwen, Hartman, & Visscher, 2009) and perform the activities at lower intensities (Engel-Yeger & Hamed-Daher, 2013) than their sighted peers.

To increase the PA levels of children and young adults with blindness, it is necessary to acquire knowledge of the personal and environmental factors that facilitate PA participation or make adherence to PA more problematic – also termed facilitators or barriers (World Health Organization, 2001). One perspective is to explore the individuals' experiences. Some studies have assessed the self-perceived facilitators of and barriers to PA

participation among children and adolescents with various physical disabilities (Shields & Synnot, 2016) and visual impairments (Greguol, Gobbi, & Carraro, 2015; Haegele & Porretta, 2015; Lieberman, Robinson, & Rollheiser, 2006; Stuart, Lieberman, & Hand, 2006; Wiskochil, Lieberman, Houston-Wilson, & Petersen, 2007). Reported facilitators include family involvement, PA being highly valued by individuals, socialization, fun and a sense of success, the competence of the instructor, autonomy in the choice of activities and peer acceptance (Shields & Synnot, 2016). Commonly reported barriers include lack of motivation, bullying and negative attitudes from peers and others, reduced gross motor skills, lack of activities in the local community, lack of qualified instructors, poor information about the programmes and having few peers with whom to do the activities (de Schipper, Lieberman, & Moody, 2017; Greguol et al., 2015; Haegele & Porretta, 2015; Lieberman et al., 2006; Shields & Synnot, 2016; Stuart et al., 2006; Wiskochil et al., 2007).

A few studies have examined the experiences of individuals with visual impairments on their participation in physical education and leisure-time PA (de Schipper et al., 2017; Lieberman et al., 2006; Stuart et al., 2006). To our knowledge, no studies have focused on critical issues when individuals with visual impairment have successfully joined competitive sports for the sighted. Being unique in a global perspective, the Norwegian

Olympic Committee and Paralympic Committee Confederation of Sports is committed to offer sports for all people, including those with impairments (Norwegian Directorate of Health, 2004). Since there are no sports designed for children and young adults with visual impairments in the geographic area they are living, the individuals are often included in competitive sports together with sighted peers.

The purpose of our case study was to examine the perceived experiences of participation in physical activity among two individuals with blindness, both of whom lived in Norway and had succeeded in becoming physically active on a regular basis.

## **Materials and methods**

### *The Norwegian system*

Statped, the Norwegian support service for special needs education, is a Norwegian government agency and public service managed by the Norwegian Directorate for Education and Training.<sup>1</sup> Statped's services are divided into four regional offices, each of which has specific areas of responsibility. The regional offices provide services within six different fields— one of which is visual impairment – and use a multidisciplinary approach.

Statped offers its services to individuals and at system level. The working methods for individual and system-based interventions are intended to support the basic principles of inclusive education and inclusion in society. In addition to providing services to the municipalities and counties, Statped functions as knowledge and resource base for special needs education and information or help related to such education.

### *Statped*

In Norway, children with visual impairment are educated within in the same geographical area in which they live. However, teachers and sport club trainers often lack competence to teach or guide persons with visual impairments. Statped's departments specializing in vision offer information and channels of communications to employees at kindergartens, schools and sport clubs who want more information about special needs education for persons with visual impairments. Advisors working at Statped can travel to a person's school, sport club or home. Additionally, courses and workshops are held in the region for users and their parents or guardians. Statped works strategically to develop new knowledge based on research and practical experience.

### *Participants*

We used a convenience sample and the participants were recruited from the Department of Visual Impairment in Statped Mid-Norway (the regional office covering three counties in central Norway). Three persons were invited to participate in the study, all of whom were totally blind and were active members of public sports clubs. One declined due to lack of time, and two accepted the invitation to take part in the case study: A girl aged 12 years and a young man aged 23 years. They received written information about the study and a copy of the interview guide and prior to the data collection the two participants gave their written consent to participate in the study. In the case of the 12 year old participant, her parents returned a signed agreement consenting to their daughter being interviewed.

The participation letter stated that the participation in the study was voluntary. The participants were assured that if they refused to participate it would not have any impact on their connection with or relationship to Statped. In addition, they were informed that they could withdraw from the study whenever they wished, without any consequences.

### *Study design*

We used a descriptive case study design for our research. This method enabled us to describe the views of two young people with blindness who participated in organized PA and the Norwegian context in which the PA occurred. Information was collected from individual structured interviews with open and closed questions (DiCicco & Crabtre, 2006). This method enabled us to gather detailed information about the participants' PA behaviours, their experiences of what might have helped them to participate in PA, and their experiences of problems concerning regular participation in PA. We chose telephone interviews for data collection because this method was more feasible given the long travel distances between the participants and the interviewer (the second-named author, who currently works as a senior advisor in the Department of Visual Impairments at Statped midt).

### *Data collection*

The interviews were held in October 2016. Each interview lasted for about one hour. The interviews were audiotaped and the information was later transcribed.

The interview guide included open-ended and closed-ended questions. The participants were asked whether they were physically active (type of activity, hours, frequency and intensity), about their visual impairment, participation in PA and experiences of participation, transportation and guidance, social life, friends, motivation to participate and their opinion of what could be done to make the physical training more successful for them.

### *Data management and transcription*

Verbal information from the recorded interviews was transcribed by the second-named author. Thereafter, the third-named author organized the transcribed information in tables. To enhance the trustworthiness, validity, and accuracy of the information, a member check was carried out. During the process, the participants and their parents verified our interpretation of the data.

### *Ethics and approval*

The study was approved by Statped midt's Department of Visual Impairments and the Norwegian Centre for Research Data (NSD). The project protocol was presented for approval by the Regional Committee for Medical and Health Research Ethics (REK- midt), but REK- midt responded that the project was not defined as a medical research project and therefore its approval was not required.

## **Results**

Both participants were totally blind with no residual vision: the girl was congenitally blind and the young man became blind at the age of 13 years. The characteristics of the two participants are presented in Table 1, which includes the participants' responses to the questions about their training goals and weekly training habits.

The participants' perceived experiences of PA and sports are presented in Table 2. The results showed that a good visual interpreter was considered essential for persons who are blind. Additionally, personalized individual learning was important for learning motoric movement skills. Qualified and motivated instructors or trainers were crucial for the

participants to enjoy training and to have fun. For both participants, sports participation gave them opportunities to socialize and to develop friendships.

However, the participants also reported episodes that they perceived as having been difficult and frightening. One episode was related to swimming and the feeling of a lost sense of orientation in the pool. Another episode was being laughed at when their body movements were perceived as not having been performed correctly. Both participants reported that these episodes affected their motivation and self-esteem.

In both cases, the participants' main supporter in their family was their father. Both fathers were physically active: one did long-distance running and one participated in martial arts.

## **Discussion**

By interviewing two young persons with total blindness who were regularly physically active, we were able to describe their lived experiences of participating in organized and unorganized PA in a Norwegian context. Both participants mentioned the importance of inclusive and competent instructors and visual interpreters. Other common factors were

participation in martial arts, trying a number of different sports, private transportation to the exercise facilities, physically active family members, having intrinsic goals for their PA participation and having training partners and friends. Individual motives for maintaining PA were better self-esteem, more energy and better physical fitness.

The main reasons for maintaining regular PA reported by our study participants were mostly intrinsically oriented (e.g. self-esteem, fun, energy and physical fitness). These motives are similar to those found for the general population of children and adolescents (Allender, Cowburn, & Foster, 2006), except they did not include any elements of competition or physical appearance. However, there were some differences in the two study participants' motives. The young man said that important motives for exercising were for him to be a role model for other people with visual impairments and to have enough energy to face his adversities, while the girl wanted to learn new movements and to be awarded a black belt in Taekwondo.

Previous publications have shown that certain central factors related to the environment and PA characteristics are decisive for facilitating PA adherence among individuals with impairments (Shields & Synnot, 2016; Stuart et al., 2006). One important environmental

factor is the instructor, who has the main responsibility for involving all participants in activities and making those activities safe, educational and enjoyable for them. In focus group interviews with 63 children with impairments, their parents and sport staff, Shields and Synnot (2016) found that important subthemes facilitating PA participation were the skills of the instructor, having one-to-one instruction, and the instructor's attitudes (Shields & Synnot, 2016). Stuart et al. (2006) found that having instructors who were more knowledgeable about PA participation was at the top of three ranked parent-rated solutions to increase PA participation by their children with visual impairments. The Norwegian Olympic Committee and Paralympic Committee Confederation of Sports is based on voluntary work and the majority of its instructors have not been educated in how to modify exercises for people with impairments. In our study, the participants described experiences when the sports instructor had struggled to modify the activity. They both reported that their current instructor was competent, including and motivating.

In line with the results of previous studies (e.g. Shields & Synnot, 2016), our two participants reported that they had friends and a sense of peer acceptance in their current sports club. However, the young man said that he had experienced becoming less motivated to train after others made fun of him while he was participating in sports. Bullying and

social exclusion have been shown to be major barriers to participate in organized PA and physical education classes among persons with impairments (de Schipper et al., 2017; Ratcliff, Lieberman, Miller, & Pace, 2016; Shields & Synnot, 2016; Stuart et al., 2006). For that reason, creating a positive social environment and a sense of belonging for all individuals in schools and sports clubs should continue to be prioritized.

With regard to the participants' family members, our findings supported other researchers' findings about the importance of family involvement to facilitate PA participation by those with various impairments (Greguol et al., 2015; Perkins, Columna, Lieberman, & Bailey, 2013; Shields & Synnot, 2016; Stuart et al., 2006). For example, in a study of 22 children with visual impairments and their parents, Greguol et al. (2015) observed that there was a strong correlation between the parents' PA levels and the parents support offered to the child. Moreover, parental overprotection and parents who doubt their child's physical abilities have been shown to be barriers to PA participation among persons with impairments (Shields & Synnot, 2016). Parents' influence may be less important when children reach adolescence and young adulthood due to the process whereby they seeking independency. This process may be particularly conflicting for people with blindness if they are dependent on family members for tasks such as transportation and carrying out

daily chores (Kroksmark & Nordell, 2001). In our study, this was illustrated by young man's need for his father to transport him to the exercise facility, even though he was living independently.

The economic situation may also play a role participation in PA by persons with blindness. For example, the girl benefitted from a pre-paid taxi service and a treadmill provided by the Norwegian Labour and Welfare Administration (NAV). Moreover, our participants had chosen low-cost activities that can be easily carried out in the surrounding environment for most of the season (e.g. running).

Research studies have shown that the characteristics of the activities are determinantal to PA adherence (Weinberg & Gould, 2015). In our study, both participants performed endurance training and martial arts. Although martial arts put demands on eyesight, it is a sport that is conducted in safe and manageable environments. Moreover, martial arts provide training of abilities that are lower in people with visual impairment and blindness than in their sighted counterparts, such as coordination, balance and strength (Augestad & Jiang, 2015; Houwen, Visscher, Hartman, & Lemmink, 2007). In our study, the participants

experienced improvements in physical and mental abilities due to their training. This might lead to the activity being perceived as purposeful by the individual.

We found that our study participants had tried a number of different sports. This was in contrast with our expectations that individuals with visual impairments and blindness perform few sports (Engel-Yeger & Hamed-Daher, 2013). Possible explanations may be the participants' and/or the family members' positive attitudes towards PA and sports, and positive influences from the community in which the participants lived.

### *Strength and limitations*

The use of a structured interview with open and closed questions enables us to gain knowledge about each participant's perspectives on PA participation, as well as more descriptive information about their past and current PA behaviours, training goals and physical fitness. However, the study included only two participants with total blindness, and therefore we cannot make any generalizations from the information collected.

Moreover, the verbatim data from the participants were only descriptive in nature, and data were not triangulated with other sources of information. Lastly, we used of a self-composed

interview guide. In this respect, the participants' responses might have been influenced by the construction of the question and the sequence of the questions in the interview guide. The current authors were working in the fields of PA and health for children and youths with visual impairment, and our perspectives might have biased the gathering and interpretation of the findings.

## **Conclusions**

PA and sports are important for people for social, physical and mental health reasons. In Norway, where only a few persons are blind in each community, full inclusion is one of the main goals of society with respect to PA and sports. The findings of this study show that for the two blind participants to succeed in inclusive training, they needed high-quality instructors, competent visual interpreters, safe and motivating activities, intrinsic goals for their PA participation, and experiences of a positive social environment including friends, peers and family members. These factors may foster an opportunity for individuals to experience enjoyment, enhanced self-esteem, improved physical fitness and opportunities to socialize.

PA may be an important factor contributing to the development of a good quality of life.

Replication of this study with a larger number of cases, including objective measurement of

PA and fitness and observations over a longer period are strongly encouraged for a better

understanding of the factors for successful participation in PA and sports.

#### **Declaration of conflicting interests**

The authors declare that there are no conflicting interests.

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<sup>1</sup> For brief information in English see <http://www.statped.no/spraksider/In-English/>

(Retrieved 15 October 2016)

**Table 1.** Study sample characteristics and participants' responses to questions about their physical activities and training habits.

| <b>Interview questions</b>   | <b>Female 12 years of age</b>   | <b>Male 23 years of age</b>  |
|--|---|--|
| Functional vision  | Blind   | Blind (18 years of age)  |
| Age at vision diagnosis  | Congenital  | 13 years   |
| Mobility aids  | Blind cane  | Blind cane   |
| Living with parents  | Yes   | No, living alone   |
| When you are training, what type of activity do you normally do?<br><br>How often do you participate in physical exercise? | Leisure time: Taekwondo (one session a week) plus weekends. I have also a treadmill from the Norwegian Labour and Welfare Organization at home.<br><br>At school: Three hours a week. Sometimes I'm together with the class, but if they do ball games, I and another student from the class do steps, stationary bikes or something else. I think it's cool to be together with the class at PE, but it's nice to do the training separate also. | Leisure time: Martial arts and fitness centre<br><br>Normally every day  |
| Have you tried different physical activities or sport in leisure time? If so, what are your experiences?                   | I have tried swimming and dance, and ordinary physical activity. I went swimming with my support contact. I tried hip hop. That was fun! But it turned out to be a bit difficult because so much happened at the same time. I had a visual interpreter, but even then it was hard. Maybe I could have followed the teaching if the instructions had been a little bit slower.   | I tried different team sports, but it was difficult. Too much happened. Difficult without visual interpretation.<br><br>I tried track and field, running relay, but that was somewhat difficult when nobody told me when it was [time to] exchange in [the] relay. |

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| When you are exercising, how hard do you train? (intensity) | It differs. Sometimes hard, for example when I'm running on the treadmill up to 12 kilometres per hour. Often [I'm] tired and sweat.     | Too exhausting and sweaty. I need to relax and drink [water or other hydrating liquids] after exercising.  |
| Do you feel that you are in good shape?                     | Yes, and after starting training Taekwondo I got better self-esteem. Earlier, I got tired more easily. My balance is so much better now. | Yes, more energy and able to do more. Mentally more prepared to meet adversity. Better motoric balance. Before I started training, I could hardly stand on one foot for two seconds. |
| What is your goal with your training?                       | Mostly to have fun, but I would like to get a black belt   | Be in good shape and have fun. Help other children with visual impairment to be more active.   |
| Transportation to PA/sports                                 | My parents or support person. A few times, I take a taxi.  | My father drives me.   |

Notes: PA: physical activity

**Table 2.** Perceived experiences of physical activity and sports of the participants with VI.

| <b>Interview questions</b>                           | <b>Female, 12 years of age</b>   | <b>Male 23, years of age</b>   |
|--|--|--|
| Please tell us about some of your experiences of PA? | At Taekwondo, I like to learn new movements. In school, I have my teacher or my physiotherapist in the PE class. They ask me what I like, and they listen to me. They understand me. | There are few who recognize how much you use your eyes. The trainers may think it is going fine. It's not fun when the trainers have lack of knowledge about vision loss and how to facilitate. I travel |

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|---|---|--|
|   |   | around in the country and give courses in martial arts for the visually impaired. My goal is that different sports clubs can invite persons with visual loss to participate.                 |
| Have you had some experiences that you perceived as difficult?                  | Once, my support person took me for swimming, and she did not know how to guide me. I got afraid because I didn't know where I was in the pool. I thought I was in the deep end.  | I have experienced that some trainers and participants started laughing because I didn't do the movements right. I got discouraged and I lost assertiveness. It really hurts my self-esteem. |
| What's your opinion, and what can be done better?                               | All activities require a good visual interpreter. If we have support persons, they need some education in accompanying persons who are blind. Personalized individual learning is important.  | Better information. Let the group that we participate in try [being] blindfolded for one hour. More courses, and keep great focus on inclusion in ordinary sport clubs                       |
| Who has been the most important person for you, for participating in PA/sports? | A boy with visual impairment. He has a black belt in Taekwondo. I met him when I took a course for pupils at Statped. I thought it was a really wild man's sport, but it is so fun. [...] the instructor in the club at home gives me excellent help. He knows how to interpret martial arts, and the others in the club are all very positive. The Norwegian Martial Arts Federation is really trying to include persons with impairments in clubs nationwide. | The instructor in the Taekwondo club motivated me, and the leader of the Norwegian Martial Arts Federation. My father has helped me a lot, and we train together and he pushes me.           |
| Do you have family members who are physically active?                           | My dad is a long distance runner.   | My dad and I train together and I have two siblings who play soccer.   |

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|--|---|--|
| Do you have many good friends?<br>What do you often do together with your friends? | Yes. I play with my friends. We use the swing, the treadmill, jumping on the trampoline and baking. I also Skype with a boy who is blind. | Yes, and I have got them through the sport. We train and go to a café. |
|--|---|--|

*Notes:* PA: physical activity; PE: physical education