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Exploring physical activity level after procurement of adapted tricycle; Quantity versus enjoyment

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Abstract: People with disabilities are less active than people without disabilities, and many do not reach the recommended amount of moderate intensity physical activity. This study aimed to investigate whether people with disabilities who acquired an individually adapted tricycle became more physically active, and to map which factors they reported as important for using their tricycle. People with disabilities applying for an adapted leg-driven tricycle participated in this observational study. ActiGraph GT3x accelerometer was worn for 7 days before and after acquiring the adapted tricycle (pre- and post-test). An open-ended question, in a questionnaire described factors important for tricycle use. Forty-five participants were included, aged 5 to 79 years (Mean = 32.3 years, SD = 22.7) with a large variety of complex disabilities, most with mobility impairments and some with intellectual disability. No significant change in activity level from pre- to post-test was found. However, individual differences were large. Reported reasons for not using the tricycle were bad weather conditions, pain when or after cycling, and insecurity. Reasons for using the tricycle were reported to be increased mobility, joy, and the feeling of freedom. To identify modifiable facilitators and barriers for using an individually adapted tricycle is crucial for regular use.

Keywords: adapted physical activity; disability; accelerometer; self-report motivation; facilitators; barriers

Introduction

There are numerous benefits to a physically active lifestyle, and many chronic medical conditions can be prevented with regular physical activity (Rhodes et al., 2017). However, only three out of ten adults in Norway meet the recommended amount of moderate intensity physical activity (Hansen et al., 2014). Approximately 90% of 6-year-olds meet the recommendations, whereas less than 50% of 15-year-olds do so (Steene-Johannesen et al., 2019). In addition, people with disabilities are less active than people without disabilities (Martin Ginis et al. 2021; Züll et al., 2019). Researchers have found that intrinsic motivation and self-efficacy are factors that correlate strongest with physical activity for people with and without disabilities (Rhodes et al., 2017; Saebu & Sørensen, 2011). To meet physical activity recommendations over time, it is important for people to find an activity they master and enjoy (Imms et al., 2017; O'Donovan et al., 2010).

Cycling is a widespread activity, but people with disabilities might find cycling with mass-distributed equipment difficult. They can therefore benefit greatly from individually adapted bikes (Bedell et al., 2013; Gjessing et al., 2018). The possibilities for adaptations are many, for instance, different pedals offer support for the feet, and there are seat types and

support for the upper body. Tricycles are the most commonly adapted equipment for physical activity in Norway (Oslo Economics, 2020). All people with a disability, with a permanent need for an adapted tricycle, can apply. To acquire these tricycles, people contact a physical or occupational therapist, who can then apply to the Norwegian Labour and Welfare Administration (Rikstrygdeverket, 1997). Testing and applying can be done during a stay at a regional or national rehabilitation centre in the specialist health care system, or in the municipality where the individual lives. The procurement of an individually well-adapted tricycle might enable more people with disabilities to increase or maintain their physical activity level. Many children with disabilities cycle, but even more want to do so (Nyquist et al., 2016).

Research conducted in the field of adapted equipment for physical activity describes benefits of use, but also challenges in the system of application and training, and the researchers encourage further research (Bergem, 2020; Pedersen et al., 2019; Pedersen et al., 2019b; Pickering et al., 2013). One article about the adaptation of tricycles (Gjessing & Jahnsen, 2021) and one study exploring the implications of acquiring a tailor-made tricycle (Gjessing et al., 2022) has been published.

Since the possibilities for people with disabilities to procure adapted tricycles are relatively large in Norway, many should have the opportunity for a pleasurable way of being physically active in their local environment. This could lead to numerous health benefits. However, to the authors' knowledge, no studies have been conducted to evaluate whether procurement of such a tricycle leads to more physical activity. Therefore, this study aimed to explore whether people who acquired an individually adapted tricycle became more physically active in their daily life. It also aimed to map the factors people reported as important for using or not using their tricycle.

Materials and Methods

Design

The present study applies an observational design. Ethical approval for this study was applied for. The Regional Committee for Medical and Health Research Ethics in Norway considered the study to fall outside the Health Research Act (ref.:2018/1349) and concluded that ethical approval was not necessary. The Norwegian Centre for Research Data approved this study (ref.: 549301), and the identity of the participants is anonymised.

Participants, context and inclusion procedures

Participants with disabilities who applied for an adapted three-wheeled, leg-driven tricycle (not tandem) were recruited from professionals working at three Norwegian Labour and Welfare Administration offices (in the south-east, mid and north of Norway), in five municipalities (in the south-east of Norway) and at Beitostølen and Valnesfjord Healthsports Centres. The Healthsports Centres are parts of Norwegian specialist healthcare system, and offer persons with disabilities secondary rehabilitation for one to four weeks (Røe el al., 2008), based on the theoretical framework, based on the Adapted Physical Education Model (Sherrill, 2004). Participants who were not at a Healthsports Centre, lived their ordinary life in their local community, and contacted a local therapist to start the application process. Inclusion criteria included, at least five years old, and understanding Norwegian or English language. Inclusion was not limited to any specific diagnosis, since the possibility to procure a tricycle is not limited to specific diagnoses, but to function and need. Written informed consent was collected from participants 16 years of age and older, whereas parents signed for participants below 16 years. The participants themselves or their medical records were the sources of diagnosis and sociodemographic data.

Data collection

Data were collected from May 2019 to November 2020. A pre-test, wearing an accelerometer for seven days, was performed after the participants had tested tricycles in order to apply for one, but before they received their tricycle. The participants who tested tricycles as part of their rehabilitation programme at a Healthsports Centre performed the pre-test after they returned home. For the post-test, participants wore an accelerometer for another seven days, after the participants had the opportunity to use their acquired tricycle for at least three weeks. Accelerometers were delivered to the participants at the time of tricycle testing or sent by surface mail. They all received a franked envelope to return the accelerometer after the period of measurement was completed. In cases where participants received their tricycle during winter, they waited to complete the post-test until spring, when the roads were no longer covered with snow.

Outcome measures

Accelerometer

ActiGraph (Pensacola, FL, USA) is a widely used accelerometer (Romanzini et al., 2014). The ActiGraph model GT3X weighs 27 grams and has small dimensions (3.8 cm x 3.7 cm x 1.8 cm). It has a triaxial accelerometer that collects information in three axes (vertical, medio-lateral and antero-posterior) and can combine this information into a vector magnitude. Participants with walking ability wore the accelerometer on their right hip, fastened with an elastic band. Participants using wheelchairs wore the accelerometer on their non-dominant wrist. Participants were instructed to wear the accelerometer from when they got up in the morning until they went to bed at night. They removed the accelerometer when showering, when swimming, or performing other activity in water. Activity performed without the accelerometer was reported on a form and included in the analyses as light activity. The form also contained a question regarding whether the participants' activity level had been about normal during the week of measurement.

Questionnaire

At the same time as the participants received the accelerometer, they also received a questionnaire with questions regarding their cycling. The questionnaire was created on Typeform, and a link was sent to the participants or their parents via e-mail. Most of these results have been presented and discussed in an earlier article (Gjessing et al., 2022). The questionnaire also contained an open-ended question about their own cycling, which is relevant for the aim of this study: "Do you have other comments regarding your cycling?" Participants commented on issues perceived as relevant for their cycling. They gave several reasons for using or not using their tricycles, and these comments are reported in this article. The open-ended question is the only part of the questionnaire used in this study.

Analyses

Descriptive analyses were conducted to reveal sample characteristics. Time in different activity levels – low, moderate and vigorous – was given in minutes. Cut-off-points for each activity level were: sedentary: 0–99 counts/min, light: 100–1999 counts/min, moderate: 2000–4999 counts/min, and vigorous: 5000 counts/min and above (Aadland & Ylvisåker, 2015; Stålesen et al., 2016). In addition, the accelerometer counted steps. Skewness was found in parts of the data regarding moderate and vigorous intensity activity. Logarithmic transformation converted to normally distributed data, and allowed the use of a paired t-test. Cohen's d was used to find the effect size, with the following interpretation: $0.0<0.2$ = negligible, $0.2<0.5$ = small, $0.5<0.8$ = medium and 0.8 or more = large (Laake et al., 2015). A Spearman nonparametric correlation test was performed to determine the amount and

significance of correlation between the different factors. A correlation of 0.5 or higher was considered moderate, whereas 0.8 or higher was considered high (Akoglu, 2018). The level of significance was set to a *p*-value of .05 or lower. Mainly, SPSS version 25 was used to record and analyse the accelerometer findings. SPSS version 27 was used to make an additional calculation of effect size that could not that could not be completed in older versions.

Responses to the open-ended question in the questionnaire were translated and categorised in groups according to the characteristics of the comments. Statements from the participants were preserved as they were written, to prevent changing of the meaning content. The grouping of comments was based the authors' assessments of whether they belonged in the category of positive or negative comments, or on whether the participant had a positive or negative change in physical activity level from pre- to post-test. Relevant points from the standards for reporting qualitative research (SRQR) (O'Brien et al., 2014) were used.

Results

In total, 66 people consented to participate. Some were excluded from the study because they ultimately got a tandem bike (n=2), or because they could not be reached (n=5). Thereby, agreement regarding measurement with the accelerometer was not made. A few accelerometers were returned without being used (n=3). Another 11 participants did not get the opportunity to wear the accelerometer the second time because they did not receive their tricycles before the cycling season ended. Some of these participants waited more than one year. Both a pre- and post-test with accelerometer-testing for seven days were conducted by 45 participants. Their results constitute the basis for the analyses. Dropout analysis showed that the group of 21 not included were similar to the group of included participants (Table 1).

Table 1. Sample characteristics of included and excluded participants' age, sex, place of residence, diagnosis, and location for the application procedure. Chi-square test to detect possible differences between the groups.

	Included (n=45)	Excluded (n=21)	Chi-square test	
	%	%	Value	p
Age*			30.199	.778
5–10	20	28.5		
11–16	22	10		
21–29	16	14		
43–50	18	19		
53–79	24	28.5		
Sex			.340	.560
Female	60	52		
Male	40	48		
Place of residence			.070	.792
City	49	52		
Rural	51	48		
Diagnosis			.696	.874
Neuromuscular diseases	42	33		
Cerebral Palsy	20	24		
Intellectual disability	13	19		
Others	25	24		
Applications conducted			1.677	.195
Health sports centres	64	48		
Local therapists	36	52		

*No participants were between 17-20, 30-42, and 51-52 years old.

The participants ranged from 5 to 79 years old (Mean = 32.3 years, SD = 22.7). They happened to be spread into two age groups: under 30 and over 42 years of age. There were more female than male participants, but the distribution of rural or urban place of residence was equal. There were participants from all the Norwegian counties. The participants presented a large variety of complex disabilities, such as cerebral palsy, which was the most common diagnosis (20%). Examples of other diagnoses were multiple sclerosis, muscular dystrophy, osteosarcoma, myopathy, spina bifida, stroke, spinal cord injury, other rare congenital syndromes, delayed psychomotor development and Down syndrome.

Testing

Most participants used the accelerometer within the time frame of three to five weeks after they got their tricycle. However, nine participants got their cycle too late in the autumn or during winter to conduct post-test within this time frame. These participants were tested three to five weeks after they had opportunity to start their cycling season the following spring.

Accelerometer results

The results from the paired samples t-test showed no statistically significant change in activity level from pre- to post-test, neither in terms of light, moderate or vigorous intensity physical activity, nor step counts (Table 2). The effect size between the two time points were negligible.

Table 2. Paired samples t-test showing mean activity level at pre- and post-test, and effect size.

	Pre-test		**Post-test**				
	Mean	SD	Mean	SD	Change	p	d
Light activity (min)	1499	510	1476	510	- 23	.67	0.063
Moderate activity (min)	715	479	655	371	- 60	.50	0.165
Vigorous activity (min)	115	124	106	115	- 9	.65	0.096
Step counts (steps)	40141	23011	38321	20801	- 1820	.47	0.109

The Spearman nonparametric correlation test there were conducted to seek for correlations between activity level and sex, age, diagnosis or place of living. However, the test showed no statistically significant correlations (Table 3).

Table 3. Spearman (ρ) nonparametric correlation tests between activity level and sex, age, diagnosis and place of living.

	Diff MVPA		**Diff Steps**		**Sex**		**Age**		**Diagnosis**	
	ρ	**p**	ρ	**p**	ρ	**p**	ρ	**p**	ρ	**p**
Diff Steps	.769	<.001	-	.						
Sex	-.042	.785	.140	.360	-	.				
Age	.248	.101	.200	.187	-.108	.478	-	.		
Diagnosis	-.020	.896	-.089	.562	.081	.597	-.102	.505	-	.
Place of living	.038	.806	<.001	1.000	-.109	.476	-.164	.280	.115	.450

Note: Diff MVPA = Difference in Moderate-to-vigorous physical activity, Diff Steps = Difference in step count

Regarding the change in moderate- to-vigorous activity intensity (MVPA) from pre-test to post-test, the variation was large. The spread from one participant with an increase in MVPA of 104% to another with a reduction of 74% (Figure 1). Two-thirds of the participants had an increase or a reduction in MVPA of 40% or less. When it comes to step counts, two positive results with an increase of 227% and 202% stand out, while the rest were spread from an increase of 92% to a decrease of 79%. Three-quarters (73%) of the participants had an increase or a reduction of step counts of 40% or less. Some participants had quite different results across the MVPA count and step counts. Some had a negative or positive

change in both parameters, whereas some had a negative change in one parameter and a positive change in the other. Despite these differences in MVPA-scores and steps-scores, the two parameters were closely correlated (.77) (p = < .001).

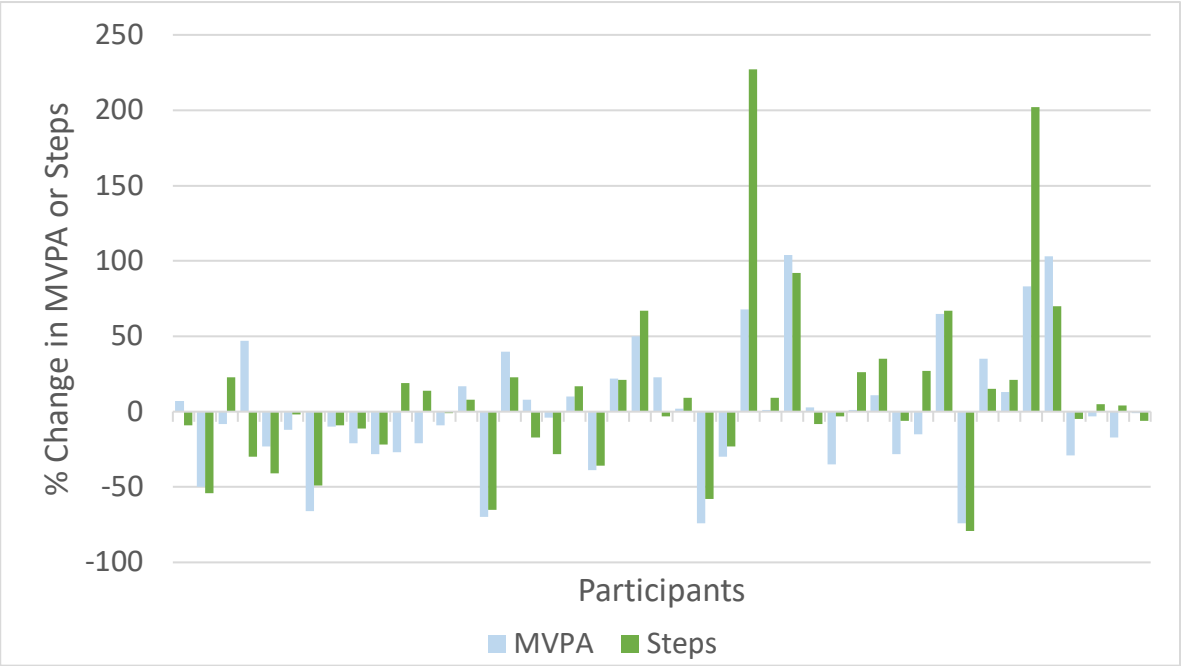

Figure 1. Change in MVPA and steps (%) from pre- to post-test.

Questionnaire results

Thirty-two participants used the opportunity to answer the free-text question in the second questionnaire (See Table 4). Of these, 10 reported reasons for why they did not use the tricycle as much as they planned. The main reasons reported were small amounts of cycling were due to the weather conditions (n = 4) and feeling insecure on the tricycle or in traffic (n = 3). Other reasons mentioned were pain when or after cycling (n = 2) and low amounts of cycling because the participant did not remember that it was a possible activity (n = 1).

Twenty-two participants described positive experiences with their received tricycle. The answers mainly included the three themes, increased mobility, freedom, and joy. The theme, increased mobility, concerned the use of the tricycle as a means of transport in the local community. Also, it reflected movement over larger distances than what was possible prior to receiving their tricycle. The theme, freedom, consisted of the feeling of being independent and the possibility to travel to places they wanted to go without having to plan it with others. Examples of statements from the participants were, “I can leave and come back whenever I want. It’s like getting my life back!” and “I feel free!” The third theme, joy, contained expressions from the participants about the fact that using the tricycle gave them a lot of pleasure. They expressed their relief that they could finally reach high speeds and feel the wind in their hair. “I love cycling at high speed!” and, “the bike is fantastic and gives me lots of fun!” were statements from two participants.

When these comments are matched to the results from the device measure of physical activity level, it is clear that there are some comments that can explain the decrease in activity level from pre- to post-test (Figure 2). The figure also shows that one participant reported cycling a lot, but still had a decrease in general physical activity level.

Table 4. Participant comments.

	Positive comments	Negative comments
Comments from participants with a positive change in MVPA- and step-counts	Cycling has given me a new life. I am not dependent on anyone. I can leave and come back whenever I want. It's like getting my life back. The bike is fantastic and gives me lots of fun! *Female, 60 years old.* I love cycling at high speeds! *Female, 10 years old.* It is amazing to have the opportunity to cycle again! *Female, 58 years old.* I feel more mobile with the bike, and I can be outside, which I love! *Female, 50 years old.* Cycling gives me freedom, self-esteem and joy! *Male, 59 years old.* Important with well-adapted bike paths. Male, 45 years old. I cycle both in my local community and on longer trips. *Male, 21 years old*. I feel free! Male, 12 years old.	The bike works fine, but I'm in strong pain after longer rides. That, plus the generally worse shape, makes it harder to find motivation for cycling. *Female, 65 years old.* Little cycling due to illness and a lot of rain. *Female, 10 years old.* I have not cycled that much lately because of rainy weather. *Female, 22 years old.* Important with well-adapted bike paths. *Male, 45 years old.* Little cycling due to a bit too much spasticity and snow/ice in the hill down from my house. *Male, 59 years old.*
Comments from participants with a positive change in MVPA-count and negative change in step counts or vice versa	I am very happy with the type of bike I have now. *Female, 53 years old.* Great to get out! *Female, 50 years old.* I'm in better shape now. I'm glad there is not much «secondary» pain after cycling. *Male, 54 years old.* I like cycling on asphalt or in the woods. I prefer bikes with good shock absorption. *Female, 21 years old.* I think it's nice to cycle over long distances. *Male, 9 years old.*	I struggle to remember that cycling is a possible activity. *Female, 21 years old.*
Comments from participants with negative change in MVPA- and step-counts	Cycling is very weather-dependent. *Male, 68 years old.* My tricycle is beneficial as a means of transport. *Female, 24 years old.* I love my tricycle! I have been cycling a lot the last two months. *Male, 27 years old.*	Cycling is very weather-dependent. *Male, 68 years old.* We will focus on more cycling when the weather improves! *Male, 13 years old.* I have cycled little because of back problems. *Male, 63 years old.* Too bad, the new bike was not adapted when I received it, so I did not get to use it this season. No cycling due to snow and ice. *Female, 8 years old.* It's a bit difficult to keep pedalling when the speed gets too high. *Female, 9 years old.* He seems to feel a bit insecure on his new tricycle. I feel he is struggling a bit with the balance. *Mum of 12 years old boy.*

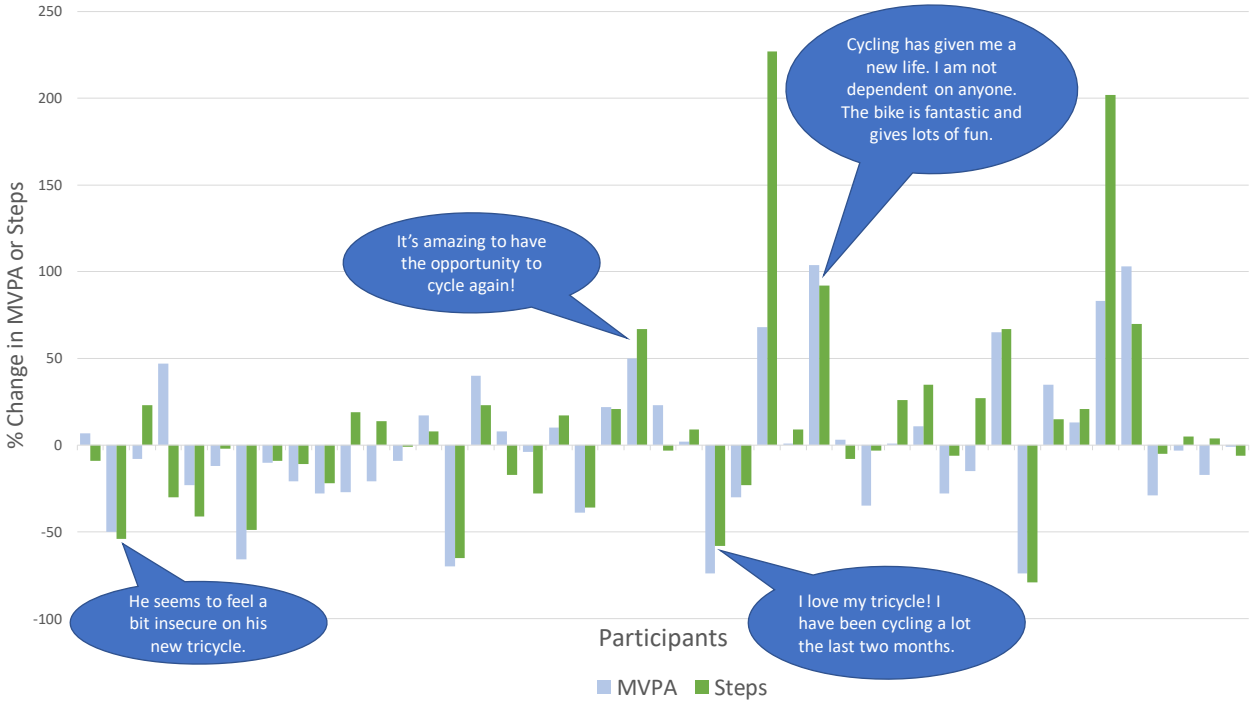

Figure 2. Change in MVPA and steps (%) from pre- to post-test, including participant comments.

Discussion

Results from the accelerometers worn by fourty-five participants before and after the procurement of an individually adapted tricycle showed no statistically significant changes in physical activity levels. Variations in physical activity levels among the participants were large, both regarding positive and negative changes. These variations did not correlate significantly with diagnosis, age, sex or place of living. Results from the open-ended question regarding their own cycling showed that main reasons for low amounts of cycling activity were weather conditions and feeling insecure on the tricycle or being in traffic. The main positive experiences described were increased mobility, freedom, and joy.

Not more active, but satisfied

At the group level, there was no statistically significant change in physical activity levels after the participants received an individually adapted tricycle. Some of the five cases – related to limited use due to pain or insecurity when using the tricycle – might be related to the tricycle itself, and such experiences could be reduced with further adjustment of the tricycle or a change to another model (Gjessing & Jahnsen, 2021). A change of seating position could provide pain reduction, and another tricycle with a lower centre of gravity or more support to the upper body might reduce the uncertainty related to sitting balance.

Almost two-thirds (64%) of the participants applied for a tricycle during a rehabilitation stay. Researchers have found increased physical functioning for adults one year after such a rehabilitation stay (Preede et al., 2015; Skatteboe et al., 2016). However, the amount of physical activity did not improve correspondingly (Skatteboe et al., 2016). Regarding children, physical activity level is expected to decrease during adolescence (Dumith et al., 2011; Majnemer et al., 2008). Nevertheless, children and youths participating in a rehabilitation stay had a stable physical activity level over a 15-month period, even if participation in other leisure activities were reduced (Baksjøberget et al., 2017). The claim that a steady activity level might be considered positive, is supported by Hammel and colleagues (2008), who claimed that "more is not necessarily better" (p1445-1460) and

highlighted the importance of enjoyment as the key indicator of successful participation. As seen in the results of this study, many participants, both children and adults, expressed satisfaction and joy when they used their newly procured tricycles. The results in a previously published article with data from the same study (Gjessing et al., 2022), showed that the participants used their tricycle regularly (median of once a week). They were also satisfied with their own cycling, with a median score of 4 on a 5-point scale. Even though the participants in the present study on average were not more active, it might be that they were active in a manner they preferred. Performing an activity you enjoy has been found to be a key indicator of successful participation (Imms, 2008). Preede and colleagues (2015) found that people with disabilities can express a high level of satisfaction without an increased amount of physical activity. It might be that they do not find the time or energy for more physical activity in their everyday life, but have found activities that they are more satisfied to perform.

Large variations

The participants showed large variations regarding change of MVPA from pre- to post-test. One participant with a reduction of 74% and another with an increase of 104%. The results from the accelerometer and the statements from the participants showed that some participants had a large increase in physical activity level and had many positive experiences with their new tricycles. It can therefore be concluded that an adapted tricycle can give individuals positive experiences in activity and contribute to an enjoyable active lifestyle.

The large reduction in physical activity levels of some of the participants can be explained by concrete reasons, such as increased pain or illness (Hodges & Smeets, 2015; Li & Chen, 2012). Other participants did not have similar reasons for a reduced activity level. They might have been less active for a short period due to bad weather or other variable factors, or they might have been in a longer period of life with a lower activity level. Some participants with quite a large reduction in physical activity levels stated that they had been physically active and had cycled many miles during the last few months. The difference in self-report physical activity and device-based measures of activity supports the need for both (Colley et al., 2018). Nonetheless, one previous study has shown that the ActiGraph GT3X under-report the amount of cycling activity (Hansen et al., 2014). The ActiGraph GT3X was chosen because it was found to be the most appropriate to measure general activity level.

The large variations among the participants suggests a need for close follow-up after each person receives an adapted tricycle. This could reveal the potential reasons for the small limited use, and assess whether these are reasons that can be addressed. Li & Chen (2012) found that professional support was an important factor for staying physically active. The professional's knowledge about equipment and motivation for physical activity might contribute to higher activity level among people with disabilities.

The participants in this study had a large variety of different disabilities and physical functioning, but some diagnoses were not as related to an increase or decrease in general activity level as others. Saebu & Sørensen (2011) found that factors related to functioning and disability did not explain variations in physical activity. Factors related to motivation and self-efficacy, however, explained more of the variation. Intrinsic motivation is a factor strongly associated with physical activity (Saebu & Sørensen, 2011; Steinhardt et al., 2020). Several statements from the participants in this study express their satisfaction and joy when using their tricycles. Ryan and Deci (2000) strongly connected joy in activity to intrinsic motivation, and thereby increased chance of continued activity. Scarpa (2011) claimed that adolescents and young adults practicing in sport had positive self-concept and high self-esteem, which again facilitates more physical activity. A focus on such positive experiences

in activity is therefore recommended when professionals meet with people with disabilities (Rosenbaum & Gorter, 2012).

Strengths and limitations

The most obvious limitation of this study is the time frame, in two different manners. First, because of the delay from applying for a tricycle to receiving one, many other factors than the tricycle itself might affect the participants' physical activity level. The season of the year is different, general health condition might have changed and motivation for cycling, or other physical activity, might be different from the time of application. Second, the post-test was performed quite close after receiving the adapted tricycle. Since it can take time to learn new skills and incorporate new habits, it would be valuable to implement another follow-up measure using accelerometers after a longer period of time.

The intervention, with adaptation, trial and learning to use tricycles, was not standardised, since individual adjustments were essential and since each individual's surrounding factors would be difficult to control. Therefore, post-test results were only compared to each individual's pre-test.

The lack of consistency regarding the placement of the accelerometer might be considered a limitation. However, the authors considered that it was best to place it on the location reported as giving the most accurate measures (the hip). As some of the participants would naturally have produced misleading results with this placement, an alternative (wrist) was chosen for them. All participants wore the accelerometer at the same place at both periods of measurement. The placement of the accelerometer did not have a decisive meaning for the result, as the amount of activity was not compared across participants, but rather with measures from the same person at pre- and post-test. The accelerometer has previously showed to under-report cycling activity. Participants might therefore have cycled more than the accelerometer presented as moderate or vigorous activity.

The data collection was partly carried out during the COVID-19 pandemic. Some professionals might have been unable to perform their normal tasks for a period of time, which might have led to a somewhat deficient follow-up regarding the adaptation of tricycles upon delivery. Thereby, the results might have been slightly affected.

Conclusions

Even though people with disabilities in Norway use their opportunity to procure an individually adapted tricycle, this does not necessarily lead to an immediate increase in general physical activity level in these people's lives. It seems important to pay attention to people's reasons for not cycling, so that reasons are acknowledged and changed accordingly. The weather conditions cannot be influenced, but the feeling of insecurity can be reduced with a longer trial and learning period to create a sense of mastery and security (Gjessing et al., 2022). Positive factors associated with cycling, such as the feeling of joy and freedom, indicate that participants were not more active, but more satisfied with their way of being active, which is also beneficial for their health.

Perspectives

Since regular physical activity contributes to the prevention of many chronic medical conditions, and since cycling is seen as a gentle, relevant and enjoyable activity for many, it is very positive that so many people with disabilities in Norway have the opportunity to procure an individually adapted tricycle. At a group level, the participants did not increase their level of physical activity. Research exploring long-term effect on physical activity levels after procuring an adapted tricycle will therefore be relevant. Also, more research to identify modifiable facilitators and barriers to regular use of an acquired tricycle, both individual and environmental factors, is needed. Such facilitators and barriers might be addressed by

professionals, family and friends, and create better conditions for increased physical activity. Thus, more children, youth and adults with disabilities might meet the recommended amount of amount of physical activity, and enjoy the health benefits that an active lifestyle can bring.

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