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ORIGINAL ARTICLE



ActiveYou I – a new web-based measure of activity preferences among children with disabilities

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ABSTRACT

Background: Children's preferences for activities are one of the most important predictors for participation. Currently no web-based measure of activity preferences exists for children with disabilities.

Aim: To develop and investigate feasibility and internal consistency of a new web-based measure of activity preferences, ActiveYou I for children with disabilities.

Materials and methods: The ActiveYou I was developed in three steps using a mixed-methods design. A review of the preferred goal activities of 149 children with disabilities was used to identify relevant activities. A pilot version of ActiveYou I was tested with 341 children with disabilities. Semi-structured group interviews and cognitive interviews were conducted with therapists and children with disabilities.

Results: Nineteen physical activities were included in the pilot version. The pilot trial resulted in two activities being excluded, and one activity added, leaving the instrument with eighteen activities. Internal consistency was acceptable (Cronbach's $\alpha \geq 0.77$). Interviews with therapists and children showed that ActiveYou I included relevant activities and was easy to answer.

Conclusion: ActiveYou I proves to be a valid and feasible, web-based instrument for mapping activity preferences in children and adolescents with disabilities.

Significance: Preferences are an important mediator for participation; consequently it is essential to seek activities that match the children's preferences.

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Choice; digital; impairment; participation; assessment utility

Introduction

A main goal for service providers in the field of rehabilitation is to optimise participation in different life arenas for children and adolescents with disabilities. When it comes to physical activities, participation in preferred and enjoyable physical activities is essential for health and well-being [1–3]. The WHO recommends that children and youth should aim for at least 60 min of moderate- to vigorous-intensity physical activity (sports, leisure activities, play etc.) daily in order to enhance health and wellbeing [4]. Therefore, it is important to have valid instruments to measure the child's preferences and participation in physical activities.

The child's participation in physical leisure activities occurs in a dynamic interaction between the child and the environment. According to the Family of Participation-Related Constructs (fPRC) model, intrinsic factors, such as the child's activity

competence, sense of self, and preferences influence participation bi-directionally and have an impact on the child's future participation [5]. Instruments that capture the child's preferences for activities are rare but essential. Shields et al. concluded that preferences were the most important predictor of participation in children with disabilities [6]. Preferences are established through past experiences of enjoyment when doing an activity, interaction with people who share the same values, and through attachment to certain places [5]. Bult et al. [7] showed that children with disabilities had lower preferences for activities than children without disabilities. There seems to be a correlation between preferences and a person's self-efficacy, as children who indicate lower preferences for activity also show a lower level of self-efficacy [8]. The child's self-efficacy is influenced by previous experiences of success. One can assume that children with disabilities experience less success in physical activities, and there is evidence that children with

disabilities meet participation restrictions in various activities due to physical, social, and attitudinal barriers [9,10]. Furthermore, children with disabilities often do not participate in activities they prefer [7,11]. Especially for children with more severe disabilities, there is a higher proportion of activities in which they may not, but would like to participate [12]. The child's age and gender also influence the preference for activities; younger children seem to prefer recreational activities, while adolescents are more engaged in social activities, and many boys prefer physical activities, whereas girls are more interested in social activities [9,13,14].

Since preferences for activities are based on the child's interests and will influence the child's level of participation, it is important to take children's activity preferences into account when planning an intervention. Consequently, it is essential to use valid and reliable instruments to capture the child's preferences, and it is desirable that the child answers questions about their specific preferences. A search for literature about instruments measuring children's preferences identified only one measure, the Preferences for Activities in Children (PAC) [15]. The PAC was developed in 2004 and is a self-reported measure of a child's preferences for 55 leisure activities, appropriate for children and adolescents between the ages of 6 and 21 years. It is developed both for children with and without disabilities [16]. The Children's Assessment of Participation and Enjoyment (CAPE) is a companion, self-reported measure of children's participation in the same 55 items as PAC, providing information about the child's participation regarding diversity, intensity, the context, and enjoyment [16]. The PAC investigates what the respondents want to do, while the CAPE investigates what they actually do, and if they are enjoying what they do or not. The PAC is considered to be an extension of the CAPE, but can also be used on its own.

Since measures of the child's preferences gather information about what type of activities may lead to high participation for a certain individual, it is important that measurements of preferences include relevant activities. The CAPE and PAC were developed 14 years ago and consist of different leisure activities, such as skill-based and self-improvement activities in addition to other activities. Clinical experiences with use of the CAPE/PAC have shown that some activities that children with disabilities participate in are missing, and that the CAPE/PAC needed to be adapted for the Scandinavian culture [14,17,18].

The CAPE/PAC contains cartoon images of various leisure activities. Earlier cultural validation studies of the CAPE/PAC indicate that these images need to be replaced with more appealing images, for example photos [13]. It is desirable to develop user-friendly instruments, and therefore a web-based instrument may be preferable. There were also restrictions from the publisher, with the consequence that the Norwegian versions of the CAPE/PAC could not be published [17]. Consequently, there was a need for a modified, updated, and validated instrument to evaluate preferences for participation in physical activities of children with disabilities in a Scandinavian context. Following a discussion with the first author of the CAPE/PAC (G. King), an instrument inspired by the PAC has been developed.

Constructing the pilot version

Beitostolen Healthsports Centre (BHC) is a specialist rehabilitation centre in Norway that offers rehabilitation services based on a family-centred approach for children and youth with disabilities. The main goal is to optimise lifelong activity and participation for persons with disabilities in their local environment [19]. The intervention at BHC is based on the principles of adapted physical activity [20], and the vision that children with disabilities should be able to participate in preferred physical activities by changing the characteristics of the task and/or the environment. Before the ActiveYou I, the children/adolescents, together with the therapists, identified preferred activities by using the PAC and set physical activity goals by using the Canadian Occupational Performance Measure (COPM). The COPM measures changes in the child's performance in and satisfaction with everyday activities that the child wants and needs to change, and provides the basis for setting intervention goals. The COPM is a generic instrument that can be used among all age and diagnosis groups, however if the respondent is under 7 years old, or has a cognitive impairment, guardians can be interviewed on behalf of the respondent [21]. However, clinical experience of using the PAC and the COPM for goal-setting purposes and evaluation, found that the PAC needed to be adapted for the Norwegian context, and the COPM was found to be too abstract and not user-friendly for the children. Therefore, ActiveYou I was developed as a web-based self-report assessment, with photos of alternative modes of performing the activities and smileys as response alternatives, designed to

be easy for children with disabilities to respond to with minimum guidance.

The identification and selection of activities to be included in the instrument was based on a review of a previous study of preferred PAC and COPM-goal activities of children with disabilities ($n = 149$) [19]. The physical activity goals were set among children with disabilities at BHC as a part of Astrid Nyquist's PhD project and were collected from her thesis [19]. To identify relevant physical activities to be included in ActiveYou I, the most frequently preferred physical PAC activities, and COPM goals were listed and discussed among the team leaders at BHC (13 experienced physiotherapists and sports pedagogues) until consensus was reached. It was important that the activities were preferable and could be done both at BHC and in the children's local community. In total, 19 physical activities were identified and included in the pilot version of the instrument. The 19 activities are listed in Table 1.

The texts following the activities in ActiveYou I were carefully discussed by the professionals before they were put together with the chosen photos describing the activities. It was essential that the photos clearly illustrated different kinds of organised and unorganised indoor and outdoor physical leisure activities that could be done during different seasons of the year. The persons in the photos should be of both sexes, of different ages, doing activities with and without assistive devices. When the professionals had agreed upon the 19 activities, photos and texts, an IT company made the web-based test version of ActiveYou I. Then the professionals at BHC started a new discussion of the pilot version concerning layout;

colours, placements, fonts, and other technical issues, before the web-based pilot version was finalised to be tested in the clinical setting.

Before implementing the ActiveYou I in a Norwegian context, it is essential to investigate whether the content in the instrument is valid for the target group of children, and whether relevant physical activities are included. Methodologically, the question is whether the web-based instrument is applicable and easy to understand and complete by children with disabilities. The aim of this study was to develop and investigate feasibility and internal consistency of a new web-based measure of activity preferences for children with disabilities.

Methods

Design

This is a content validity and feasibility study [22] of a new web-based measure of children's preferences for physical activities; ActiveYou I, applying mixed-methods design [22]. A feasibility study was used to discern the advantages and disadvantages of undertaking a new measurement method before investing time and resources in it [22]. By using mixed-methods design, elements of qualitative and quantitative approaches were combined (e.g. data collection and analysis) to achieve a better understanding of children's preferences for physical activities [23]. Measure development involves a step-by-step process of defining the construct, creating items, administering and analysing items, and providing evidence for validity [24].

The project was submitted to the Regional Committees for Medical and Health Research Ethics (REC) South-Eastern Norway, but was considered to be outside the remit of the Medical and Health Research Act; it could, therefore, be implemented without the approval of the REC, reference number 2016/1469.

Procedure

The developmental process of the web-based ActiveYou I involved three steps as illustrated in Figure 1.

The aim of the first step was to test a web-based pilot version of ActiveYou I including the 19 physical activities. The web-based version of ActiveYou I was sent to all children ($n = 341$) with disabilities who participated in a rehabilitation stay at the BHC in 2015, (Table 2). The children responded to the

Table 1. Activity preferences from Step 1, $n = 341$, children with disabilities aged 5–18 years.

Activity	Proportion of scores		
	Don't want %	Maybe %	Really want %
Be in the pool	2.6	11.4	85.9
Horseback riding	12.3	22.3	65.4
Play in the snow	18.2	17.6	64.2
Bicycling	10	28.2	61.9
Do outdoor activities	9.7	31	59.2
Do individual sport/activity	9.4	31.7	58.9
Climbing	17	29	54
Train in the gym	11.7	34.6	53.7
Do water activities outdoors	20.8	25.5	53.7
Do alpine skiing	28.2	20.2	51.6
Do activities on ice/snow	24.6	25.2	50.1
Go skiing/ski-pigging	26.7	24.3	49
Move to music	25.8	26.1	48.1
Do activities on wheels	16.4	36.4	47.2
Go/roll for a trip	19.9	33.4	46.4
Do team sports	24.9	29	46
Play/play games outdoors	20.2	39.3	40.5
Do orienteering	28.2	41.9	29.9
Practice wheelchair technique	65.7	17	17.3

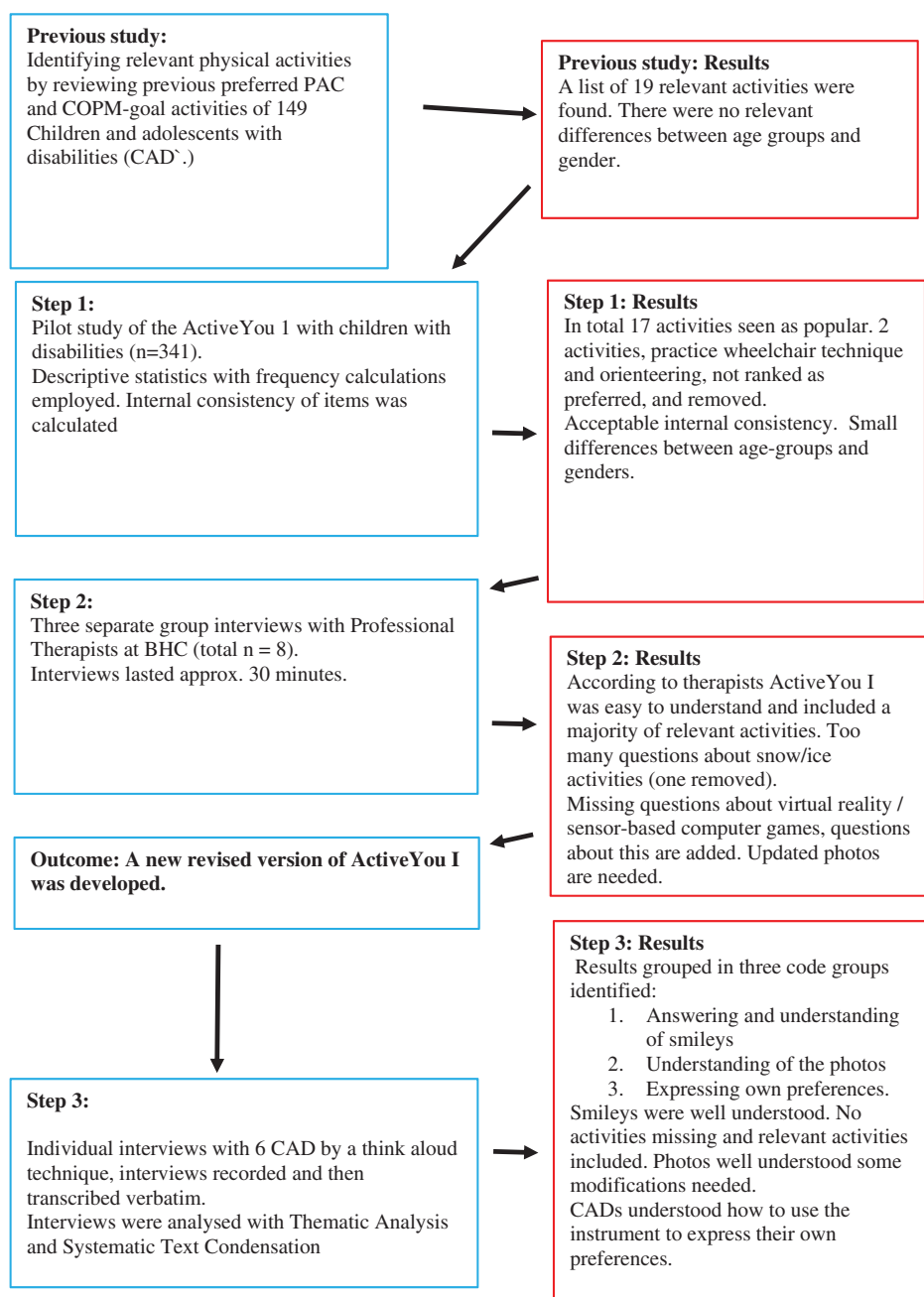


Figure 1. Overview of the development process.

Table 2. Participant characteristics in Step 2, $n = 341$.

Diagnosis	n (%)
Cerebral Palsy	126 (37.0)
Neuromuscular diseases and neurological sequelae	31 (9.1)
Intellectual disabilities, learning- and behavioural disorders	42 (12.3)
Sensory loss	14 (4.1)
Musculo-skeletal and metabolic disorders	42 (12.3)
Chromosome deviations/-syndromes	47 (13.8)
MMC	9 (2.6)
Neurological diseases	30 (8.8)

ActiveYou I electronically three weeks before they arrived at BHC by using a four digit ID number and a password to log in to the website.

The digital form, which was developed at the BHC, consisted of an introductory page informing the child about the aims of the project and how to respond to the pilot version, illustrated by photos of children doing the activity with and without assistive devices (see [Figure 2](#)). The instruction was that children should try to answer ActiveYou I by themselves, and only ask for help from a parent if needed.

The children had to rate how much they would like to try the different activities on a three-point scale with smileys: 1 = don't want, 2 = maybe want and 3 = really want to try (see [Figure 2](#)). The child

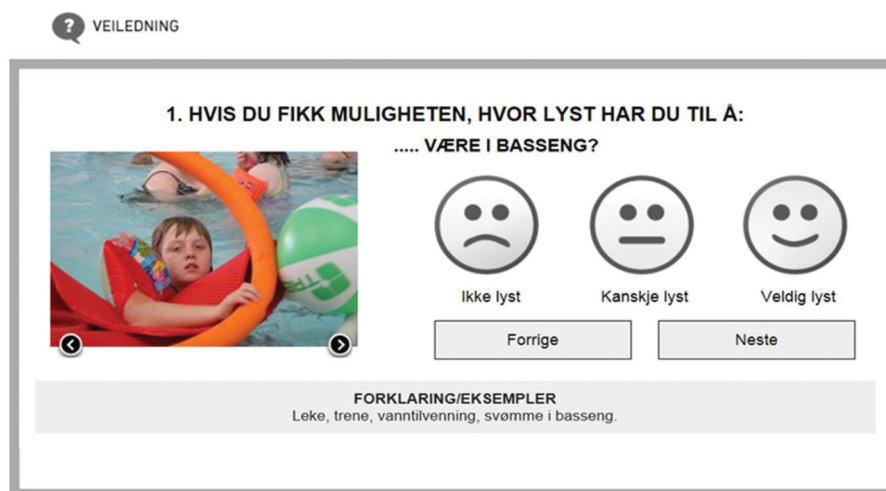


Figure 2. Example of the activity 'be in the pool'. The instructions of ActiveYou I are: *if you had the opportunity, how much would you like to try this activity?*

also had an opportunity to enter a free-text comment if they missed any activities, or had something else they wanted to add. An email address to an administrator at BHC was attached, if the respondents had questions on how to respond to the ActiveYou I.

The aim of the second step was to identify potential problems and challenges that could arise when responding to ActiveYou I, regarding the questions, photos, and whether relevant activities were included. Three group interviews were conducted with three physiotherapists and five sport pedagogues from the different teams working with children at BHC. The team members had long experience of working with a goal-setting approach among children with disabilities (meeting approximately 450 children per year). The interviews were performed in small groups of two or three team members and the interviewer in a meeting room at BHC. The interviewer used prompting questions for the different activities in the ActiveYou I, such as: *Tell me what you think of these photos. In your experience, how does the child understand this question? What do you think are the challenges for the child when answering this question? Are there any questions that are difficult to separate? Do we ask questions about activities that we do not offer anymore? Are there any activities that are missing?* The interviews lasted for approximately 30 min and were audio recorded.

The aim of the third step was to examine children's comprehension of ActiveYou I. Individual interviews were performed, where six children had to think aloud when responding to the revised version of ActiveYou I. A think-aloud technique was used in order to understand the way the individuals respond

to questionnaire items, from the respondents' perspective [25]. The technique has been used successfully in previous studies to develop and examine children's comprehension and performance on health-related quality of life and paediatric health questionnaires [26,27]. The children were asked to verbalise their thoughts while responding to the questions. The interviewer (LKD) used questions such as: *Can you tell me what you think when you see these smileys? What does it mean/what do you want to tell me when you choose, for example, the red smiley?* Other questions raised while going through the pictures/questions in the questionnaire were: *What is this person doing? Would you like to do this activity? How would you rate this activity with a smiley?* Finally, a question was asked about whether there were any activities the child would like to do that he or she had not talked about. The interviewer used prompting questions for each activity item based on the responses given, including 'tell me why did you chose [response]', 'why didn't you choose [higher/lower response]?' and 'what does [item] mean to you?'

To be included, the children had to be 5–18 years of age, have a speech capability, and both the guardians present and the child had to consent to participation in the interview. The exclusion criteria were children with disabilities who had a low cognitive ability and could not hold a conversation directly with the interviewer, and children whom the interviewer knew from earlier rehabilitation stays at the BHC. The interviews were conducted in a meeting room at BHC where the child and interviewer (LKD) could talk without interruption. The children could choose whether they wanted to come alone, together

with a guardian, or together with their contact person from the multidisciplinary team. The interview lasted approximately 15 min and was audio recorded.

Analysis

The first step used descriptive statistics with frequency calculations, in terms of number and percentage distribution to report the responses from the 341 web-based forms of ActiveYou I and to assess group differences, using Excel for Windows, 2016 version.

The internal consistency of the items included in ActiveYou I was calculated by using Cronbach's alpha, which indicates how closely related a set of items are. This was done as it was important for further testing of the instrument. A reliability coefficient of .70 or higher is considered acceptable in most social science research situations [28].

In the second and the third step thematic analysis with systematic text condensation was used in the analysis of the group interviews (Step 2), and the interviews with the children (Step 3) [29]. This method, based on Giorgio's phenomenological analysis [30], was later modified [29]. It has similarities with the procedure described in grounded theory [31]. The method is well suited to descriptive transverse analyses of phenomena that are described in data from many different informants for the development of new terms and descriptions [32]. The method consists of four steps [29]. The first is where the researcher forms an overall impression of the audio-recorded tapes. In the second step, the researcher identifies the significant elements—transcribed text that says something about the themes from the first step. The third step is the condensation where the codes are given meaning. The fourth, and last, step is a summary, where the relevant elements of the text are put together in a text that represents what the participants have said, and that gives insight to the current theme. Examples of the process are given in the results section and in the results section.

Results

Results from the first step

These results included 341 children, 79% of all children admitted to BHC in 2015, who responded to the web-based ActiveYou I. There were 145 girls and 196 boys between 5 and 18 years (with a mean age 11 years), with cerebral palsy being the most common diagnosis

The result showed that in 15 out of 19 activities, 71% of the children answered that they maybe or really would like to try the activity (Table 1). The calculation of percentages was based on the number of children that maybe or really would like to try each activity. The five most popular activities were: *Be in the pool*, *Ride/drive/tend to horses*, *Bicycling*, *Do outdoor activities*, and *Individual sports/activities*.

Two of the activities were distinguished as the least preferred, and these were *Practise wheelchair technique* and *Orienteering*. Here 224 respondents (66%) answered that they did not want to practise wheelchair technique. Ninety-six respondents (28%) did not want to try orienteering, 143 (42%) said they might want to try it, and 102 (30%) said that they wanted to, making it the second-least-preferred activity. Based on these results, showing that orienteering was not among the most popular activities and considering that orienteering was no longer an activity offered at the BHC, these two activities were excluded from the revised version of the ActiveYou I.

The result showed only minor differences in preferences regarding to age. Older children preferred to do more organised activities, whereas younger children preferred to participate in less structured activities. Being in the pool was the most popular activity, and bicycling and outdoor activities were among the top five choices in all age groups.

There were some minor variations between boys' and girls' preferences for activities. but no clear tendencies. Both groups ranked being in the pool as the most preferred activity, but in second place, the girls preferred the activity, *horseback riding*, while the boys' second-most-preferred activity was *bicycling*.

The result showed that the 19 items in the ActiveYou I had acceptable internal consistency, with a Cronbach's alpha coefficient of ≥ 0.77 indicating that the items had a high inter-correlation.

Results from the second step

The results from the second step, the group interviews with team members, showed three different themes: *The applicability of Active You I* (1), *A valuable tool for goal setting* (2), *The need for redesign* (3).

The applicability of ActiveYou I

ActiveYou I was considered to be easy to understand and answer for children. Most of the activities seemed to be relevant for children with disabilities, except for practice wheelchair technique. The therapists also pointed out that the questions; 'Play in the snow?',

'Try activities on ice/snow?', 'Go skiing/ski-pigging?', 'Alpine skiing?' were difficult to separate and that the questions asked about somewhat similar activities. Consequently, the question 'Play in the snow?' was omitted. Furthermore, the team members pointed out that ActiveYou I lacked a question regarding the use of virtual reality (VR) and movement-sensor-based computer games. As these activities were believed to be popular among many children, one such question was added to the questionnaire; 'If you had the opportunity, how much would you like to use video/VR games for training?'

A valuable tool for goal setting

The team members thought that ActiveYou I was a valuable tool in the goal-setting process. An interesting point was that some of the therapists highlighted that ActiveYou I was also useful for talking about the activities the children preferred not to do. The children sometimes claimed that they did not prefer an activity, not because they did not want to do it, but because they believed they were not able to do it. After discussions about how to adapt the activity to suit the individuals, the children often changed their preferences for the activity. The children realised that it was possible for them to do something they first thought was impossible.

The need for redesign

In the group interviews, it also became clear that ActiveYou I needed some changes in the design. It was emphasised that some photos were outdated, showing older equipment and clothing. These photos were replaced with new, updated photos. Further, some of the children did not seem to understand that it was possible to click through to see more options/photos of each activity. A technical change was made, so that the photos automatically rotated showing different photos of each activity.

Results from the third step

The results from the third step using the revised version of ActiveYou I in cognitive interviews with children, formed three themes; (1) *Answering and understanding the smileys*, (2) *Understanding the photos of the various activities* and (3) *Expressing own preferences*.

Answering and understanding the smileys

All the six respondents clearly understood the meaning of the smileys and how to use them to express their preferences. They understood that the red smiley

meant that I don't want to try, the yellow one meant that I maybe want to try, and the green one meant that I really want to try the activity shown on the photo.

Interviewer: *'What do you think when you see these pictures of smileys? Are they different in any way, do you think there is anything different between the green, the yellow and the red one?'*

Participant 3: *'This means that you don't want, want a bit and really want.'* (Pointing at the different smileys as he explains).

Hiking, and I love it very much, so green!

Riding horses, green, that's fun!

Understanding the photos of the various activities

Some of the activities were more difficult to understand from the photos, when not reading the text. Generally, 12 of the activities were well understood, but activities on wheels and dancing/moving to music were hard to understand. The photos of team sports and moving to music have to be changed and tested in a new group of children with disabilities as they still were hard to understand.

Participant 1, when shown pictures of 'ride/drive, tend to horses';

Interviewer: *What are these people doing?*

Participant 1: *Ehm, yes here they are riding horses.*

Interviewer: *Mhm*

Participant 1: *And riding horses and tidying up in the stable and brushing the horse*

Participant 4, when show pictures of 'climbing';

Interviewer: *Can you see what they are doing?*

Participant 4: *Climbing*

Interviewer: *What would you have answered?*

Participant 4: *I would have wanted to ... it looks cool (pointing to the green smiley.)*

Expressing own preferences

When asked what made some activities more fun to do than others, it was interesting to notice that several children then talked about their activity competence or activity experience. It seemed that a sense of mastery or positive experience from an activity made it more likely to be a preferred activity for the child.

I like better to do things that I am good at (Participant 1)

I have tried that, so that was fun! (canoe paddling) (Participant 5)

Other children emphasised the importance of having the right activity devices, suiting their disability in order to have a preference for an activity.

If I could sit in one of those' (a Joelette trekking cart in one of the photos from the question about hiking), I would very much like to try this (Participant 4)

The answers illustrate the importance that the photos show each activity performed in different ways, with and without activity devices.

Discussion

The aim of the present study was to develop and investigate feasibility and internal consistency of a new web-based measure of children's preferences for physical activities, ActiveYou I. The study was carried out in several steps including piloting a test version in 2015, discussions and group interviews with team members, and cognitive interviews with children with disabilities. These steps confirmed that ActiveYou I included relevant physical activities and in general was easy to understand and answer. Only minor adjustments regarding a couple of the activities and the web design were required to improve the feasibility of the tool.

According to COSMIN's general recommendations for the design of a study on measurement properties [33], it is important to provide a clear description of the construct and the development process. In this study, the construct of preferences was defined as a subjective element, and as an intrinsic factor according to the fPRC model [5]. Preferences have been identified to be an important mediator for a person's participation level [34]. Children's experience of enjoyment when doing an activity will influence future preferences for the activity [12]. The preferences may also be influenced by individual and environmental factors, such as the child's activity competence and the accessibility of activities [7]. Consequently, it is important to seek activities that match the overall preferences and competence of the child.

According to the COSMIN guidelines, the content validity should include appropriate methods for assessing the relevance of each item to the child's experience, the comprehensiveness, and the comprehensibility of instructions, items, and response options [33]. In the validation process of ActiveYou I in this context, it was essential to include relevant and preferred physical activities that were accessible at BHC and in the child's local environment. The content of ActiveYou I has proven to be valid, as the included activities are based on 149 children with

disabilities' preferred PAC activities and COPM-goals of physical activities [19]. The majority of the activities are common Norwegian activities that can be done both at BHC and in the child's local environment. Further, the pilot testing showed that the 341 children preferred and would like to try the majority of the activities. There were only minor variations between boys' and girls' preferences for activities, but no clear tendencies. The reliability testing of the pilot version of ActiveYou I also suggested that the 19 items included had high internal consistency which indicates that the scale is unidimensional [35].

The activity 'practise wheelchair technique' was the least preferred activity, it was also not relevant for many of the respondents, and therefore it was excluded. This was the only activity including the word *practise* and perhaps children did not experience the activity as enjoyable. 'Practise wheelchair technique' might be perceived more as a means of doing an activity, such as wheelchair basket, than a fun activity per se.

Orienteering was the other activity that many children did not prefer (28% did not want to try). To engage in the activity certain skill competencies are required, such as mobility and visuospatial skills. Maybe orienteering was found to be too hard to carry out for the children since all the children had disabilities and many of them had motor impairments. The results from the cognitive interviews with children indicated that the children's sense of mastery influenced their preferences for activities. In the group interviews with team members, it was pointed out that the children sometimes claimed that they did not want to try the activity since they thought it would be too hard for them. In accordance with other studies, it has been illustrated that children with a lower level of self-efficacy also had lower preferences for activities, and children with disabilities have lower preferences for leisure activities compared to children without disabilities [7,36]. Therefore, asking children which activity they would like to try, and discussing what potential barriers they may encounter to participate, is important, so that the children with disabilities do not 'settle for less' through estimating that activities are too difficult for them [7].

In accordance with the COSMIN guidelines [33], an important dimension in the validation process was that the instrument was easy to use, to understand, and to answer, regarding photos, texts, and smileys. Great emphasis was placed on finding photos that could neutrally illustrate different activities. Children with different genders and ages were featured in the

photos. The reason for this was to increase understanding of the activity and not to portray certain activities as girls' or boys' activities or intended for specific ages. It was also essential that the children could see that the activity was possible to do both with and without assistive devices, since all children, regardless of disability, should be able to participate in the activity. Photos instead of pictograms were used since it was assumed that photos were more appealing to the children and could more easily illustrate the activity with different devices. Furthermore, it was important that understanding and estimation of preferences was simple. Therefore, only three different options of smileys were used. Drawing face scales, similar to smileys, have proven to be useful for young children's estimations, especially of pain [37]. The lack of ethnic or gender features make the smileys applicable to a broad demographic group of children. When using faces scales/smileys the child can simply match how he or she feels to one of the faces, which is presumed to be easier than quantitative estimation, and generally children prefer faces scales to visual analogue scales (VAS) when given a choice [38].

There is an increasing number of participation questionnaires for children, but the majority are proxy-rated versions [39]. The preference for activities is a personal subjective experience, and consequently might be difficult to capture by someone else. Therefore, it was important that ActiveYou I was child-friendly, easy to understand and to answer. This was investigated mainly through cognitive interviews with children. The think-aloud technique was used to understand the way children responded to questionnaire items. The method has been used successfully in previous studies to examine children's comprehension of paediatric health and quality of life instruments [27,40].

A limitation was that only six children with disabilities participated in the cognitive interviews. The small sample does not allow for the generalisation of findings; however, when performing qualitative interviews, it was important to include informants who were talkative and had opinions to share. The ambition in this study was to include children with disabilities who were interested in sharing their experiences, and who represented different genders, ages and functioning levels and were living in different geographical areas. The team members at BHC, who knew the children, helped find suitable informants who fulfilled these criteria, and since the answers all went in the same positive direction, satisfactory saturation was

considered to be achieved. A limitation was that children with low cognitive and communication levels were excluded. According to Bevans et al., measurement tools should be adapted to best support these individuals' self-reporting capacity and special methods are needed, which has not been done for this instrument [14,41].

Another limitation was that all the participants included in the study were children with disabilities who had applied for a rehabilitation stay at BHC. This may have given a selection bias regarding increased preference for physical activities, and might not be representative of all Norwegian children and adolescents with disabilities. However, the catchment area was large and the population was representative to the extent that it contained children/adolescents of different ages, genders, from different geographical areas, and with different functional levels/diagnoses, which generally match the Norwegian population of children with disabilities.

The use of both quantitative and qualitative methodology, with respondent triangulation, is considered a strength of the study, and the best way to answer these complex research questions. The quantitative results give an overview of the preferences of children with a range of disabilities attending stays at BHC, and the qualitative results give deeper insight into the children's preferences on an individual level [28].

There are many different intrinsic and extrinsic factors that affect the children's preferences for activities, such as past experiences; skill competence, self-efficacy, and physical and social environment [28]. Parents' preferences for activities have also been shown to affect the children's preferences [42]. In order to gain a deeper understanding of an individual's preferences, one must also take into account and investigate these influencing factors.

Conclusion

The child's preference is an important mediator for the participation level; consequently it is essential to seek activities that match the overall preferences and competences of the child. The study showed that ActiveYou I is a valid instrument for mapping activity preferences in children and adolescents with disabilities. ActiveYou I contains relevant physical activities for the target group accessible in the child's local environment. Further, it has proven to be a user-friendly web-based instrument that the child themselves can complete. It is important that children with disabilities have the chance to express their wishes and

not settle for less. ActiveYou I contains illustrative photos of activities that can be performed with and without assistive devices, which hopefully can help to increase children's preferences for participation in physical activities.

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