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Physical activity in hard-to-reach physically disabled people

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Target population's requirements on a community-based intervention for stimulating physical activity in hard-to-reach physically disabled people: an interview study.

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Abstract

Purpose: To explore ideas of the target population about a community-based intervention to stimulate physical activity in hard-to-reach physically disabled people.

Materials and methods: Semi-structured interviews were performed with 21 physically disabled people, and analysed using thematic analyses. Findings were interpreted using the integrated physical activity for people with a disability and intervention mapping model.

Results: The intervention should aim to stimulate intrinsic motivation, and raise awareness for the health effects of physical activity. It should provide diverse activities, increase visibility of these activities, and improve image of physical activity for physically disabled people. Participants suggested to provide individual coaching sessions, increase marketing, present role models, and assign buddies. Potential users should be approached personally through intermediate organisations, or via social media and word of mouth promotion. Participants suggested that users, government, sponsors and health insurers should finance the intervention. Self-responsibility for being physically active, was strongly emphasised by participants.

Conclusions: An intervention to stimulate physical activity in hard-to-reach physically disabled people should be individualised, include personal support, and should include marketing to improve image of physical activity of physically disabled people. The intervention that fulfils these requirements should be developed and tested for effects in future research.

Implications for rehabilitation

- An intervention to stimulate physical activity in physically disabled people should aim to raise awareness for the health effects of physical activity, stimulate intrinsic motivation, offer diverse activities, increase the visibility of the possible activities and improve the image of physical activity for physically disabled people.
- An intervention should include both individual- and environmental level intervention methods. Physically disabled people most emphasised individual level characteristics of an intervention.
- For intervention development, professionals should take into account that physically disabled people believe that being physically active is a person's own responsibility.

Introduction

As described by the International Classification of Functioning model, activities and participation are important aspects of human functioning⁴². A recent meta-analysis including data of over 1 million able-bodied people showed that participating about 60-75 minutes per day in moderate intensity physical activity can eliminate the increased risk of death associated with high sitting time¹²⁴. Throughout the current study, physical activity is defined as any bodily movement produced by skeletal muscles that requires energy expenditure¹¹¹. Participation in physical activity, benefits health and functioning in able-bodied people but also in physically disabled people^{23,26}. Physically disabled people participate substantially less in physical activity compared to able-bodied people, because of several personal and environmental barriers related to their disability^{25,26}.

Scientific interest for physical activity participation in physically disabled people has increased only the past 20 years²⁷. Currently, research shifts from describing barriers and facilitators of being physically active to developing interventions to stimulate physical activity in disabled people²⁹.

5 From a behavioural science perspective, physical activity in disabled people can be described by the Physical Activity for people with a Disability (PAD) model⁴¹. The PAD model is composed from the International Classification of Functioning model⁴² and the Attitude, Social influence and Self-efficacy model⁴³, and describes how personal- and environmental factors influence intention, and how intention leads to participation in physical activity⁴¹. For the systematic development of health promoting interventions, the stepwise method of Intervention Mapping (IM) can be used as a guideline⁴⁴. The current study focusses on selecting theory-based intervention methods, and practical strategies (IM step 2 and 3). In one of our earlier studies the PAD model and the logic model of change of IM were integrated, in order to describe both an intervention that stimulates physical activity, and the physical activity behaviour itself¹²⁵.

Internationally, more than 80 exercise interventions to stimulate physical activity in physically disabled people are described in literature, of which seven were not diagnosis specific^{33,34}. Exercise was defined as a subset of physical activity that is planned, structured, and repetitive, with the intent of improving or maintaining one or more facets of physical fitness or functioning¹¹¹. To induce a long term behavioural change, lifestyle physical activity interventions are preferred rather than exercise interventions²⁴. Existing literature describes different physical activity stimulating interventions, both in the Netherlands and internationally^{20,35,126-132}. However, these

existing physical activity stimulating interventions were either diagnosis specific¹²⁷⁻¹³², or offered through primary health care, special education, or rehabilitation^{35,126,130}, but the majority of the target population is not reached²⁰. A community-based intervention, which also targets hard-to-reach physically disabled people (who cannot be reached by primary health care, special education, or rehabilitation) is required to reach the entire spectrum of physically disabled people.

Two systematic reviews on physical activity stimulating interventions for disabled people describe that there is a critical need for the development and determination of effectiveness of physical activity interventions for people with disabilities^{33,34}. In the Netherlands, an existing intervention focusses on patients during and the first year after inpatient rehabilitation³⁵. To prevent overlap with this existing intervention, the current study focusses on physically disabled people who are longer than one year post rehabilitation, or not treated in a rehabilitation centre.

One of our earlier studies, and existing literature, describes professionals' ideas on stimulating physical activity in hard-to-reach physically disabled people^{119,125}. Professionals expressed need to adapt an existing intervention, and improve collaboration between organisations, instead of creating a new intervention. According to the professionals, an intervention should aim to change participants and environmental attitude towards physical activity through for instance individual coaching, feedback, trial periods, role models, and marketing campaigns¹²⁵. However, to meet the needs, desires and capabilities of the target population, involving the target population in developing physical activity stimulating interventions is important¹³³⁻¹³⁵. No studies were found involving the target population in the early development stages of a community-based physical activity stimulating intervention for physically disabled people. In order to consider both target population's and professionals' views, the current study aims to explore ideas of the target population about a community-based intervention to stimulate physical activity in hard-to-reach physically disabled people.

Methods

Study design

A qualitative semi-structured interview study was conducted into ideas regarding a community-based physical activity intervention in physically disabled people. In this

early intervention planning phase, the use of qualitative research is recommended to investigate the attitudes, needs and situation of the target group to select the most feasible intervention components for them¹³⁶. Interviews were preferred, since qualitative research is inductive, and therefore more suitable for exploration research¹³⁷. Because of the heterogeneity of diagnoses involved that might hamper verbal expression, individual interviews were preferred, to ensure that each participant had the time and confidence to speak at ease. The Medical Ethical Committee of the University Medical Center Groningen, the Netherlands, confirmed that formal ethical approval was not required for this study (METc 2015/494).

Participants

Potential participants were sampled purposively from the patient records (2012-2014) of the Center for Rehabilitation, University Medical Center Groningen, The Netherlands. A maximum variation sampling strategy was chosen to ensure that a wide range of different ideas were investigated, in order to develop an intervention that matches the ideas of the heterogeneous target population. First, two patients were selected from the patient records from each diagnoses group (amputation, chronic pain, stroke, multiple sclerosis, neuromuscular disease and spinal cord injury) by LK, aiming at maximum variation of gender, age and living situation (urban or rural). Patient information was checked for the inclusion- and exclusion criteria written below. When patients did not meet the criteria, a new patient was selected from the patient records. Potential participants were included when they were older than 18 years, had a physical disability or chronic disease that impairs movement, and completed their inpatient rehabilitation for at least one year, or have not been treated in a rehabilitation centre. Potential participants were excluded when they had severe mental problems, insufficient cognitive abilities to participate, insufficient understanding of the Dutch language, or a rapidly progressive or terminal condition. Former patients from the Center for Rehabilitation were contacted by phone by their rehabilitation physician, after which a letter of invitation was sent including more detailed information. In the first interviews participants were not active, and were not experienced with interventions, making it hard to come up with requirements for an intervention. Therefore more active participants were recruited from a sports group associated with the Center for Rehabilitation, and another regional sports club for physically disabled people. These participants were personally contacted during a training by two of the researchers (NF and DH), after which the information letter was provided. By responding the information letter potential participants declared

their intention to participate. New participants were included until no new themes were obtained, which was after 15 interviews. Additionally seven interviews were performed to ensure data saturation.

Data collection

From January until March 2016, semi-structured interviews were conducted by two of the authors (NF and DH). Seventeen interviews were conducted by both NF and DH, three interviews were conducted by NF alone, and two by DH alone. Participants were interviewed in random order. For the interviews a topic list was used with the following items: implications of the disability, attitude towards physical activity, ideas on a community-based movement intervention, ways how to reach and approach the target population, finance for the intervention and further recommendations. Open ended-questions were asked to encourage participants to share their own experiences and ideas. Examples of questions are: How could we reach and approach hard-to-reach physically disabled people, who cannot be reached by primary health care, special education or rehabilitation? And: Who should finance a physical activity stimulating intervention for physically disabled people? The topic list was based on the PAD model (implications of the disability, and attitude towards physical activity), step 4 of the IM protocol in which intervention methods and practical applications are determined (ideas on a community-based movement intervention)⁴⁴ and the RE-AIM framework for testing the implementation process of health promotion interventions (reach and approach of the target population, and finance for an intervention)⁴⁵. The topic list was tested in two pilot interviews with persons without physical disability, and remained unchanged. Interviews were performed during personal meetings and lasted 10 to 62 minutes (mean: 27 minutes). To ensure that participants could speak at ease, most interviews were performed at home. However, for practical reasons, 9 interviews were performed at the sports accommodation (table 1). After being informed that participation was voluntary and data would be processed anonymously, participants gave their written informed consent and agreed with audio recording the interviews. To reduce bias and ensure validity every participant received a summary of the individual interview for member-checking by post. Participants were asked to indicate incorrect interpretations by returning the reaction form. Non-response within two months was assumed as a correct interpretation. One participant requested to leave out disease specific information, based on the member check.

Data analysis

The audio-recordings were transcribed verbatim (NF and DH). The transcripts were analysed using an inductive latent thematic analysis, which is recommended for applied research^{115,116}. The coding process of thematic analysis can be divided into open coding, axial coding and selective coding, and consists of six phases¹¹⁵. First, NF and DH read all interviews again (phase 1: familiarizing with data). The first four interviews were open-coded by NF and DH independently (phase 2: generating initial codes). The codes obtained from the first four transcripts were discussed by three researchers (LK, NF and DH), and clustered into sub-themes (axial coding) creating a coding tree (phase 3: searching for themes). Using this preliminary coding tree, the transcripts were coded by one of the authors (NF or DH) using Atlas.ti 7.5.10 (GmbH, Berlin, Germany). New emerging codes were added to the coding tree when necessary (phase 4: reviewing themes). For the last coding phase (selective coding), a more deductive approach was chosen, in which all sub-themes, as found during the axial coding process, were inserted into the integrated PAD-IM model (phase 5: defining and naming themes)¹²⁵. For data interpretation, summaries were made for each sub-theme in which the general view and deviant views were described. These summaries, formed the basis for the report (phase 6: producing report). To ensure consistency in coding, NF and DH constantly discussed the coding, and final coding was checked by the first author. Sub-themes and final interpretation were discussed with all co-authors.

5

Results

In total 22 physically disabled people participated (table 1), of whom one was excluded due to unexpectedly insufficient cognitive abilities. In five interviews a partner or nurse assisted the participant. Assistance varied from complementing answers to helping with speech-related issues.

Table 1: Characteristics of the participants

#	Age (y)	Gender	Diagnosis	Physical activities	Interview location	Assistance	Inpatient rehabilitation ^a
1	55	Male	Paraplegia	Wheelchair tennis	Home		Yes
2	24	Female	Neuromuscular disease	-	Home	Father	No
3	69	Male	Transfemoral amputation	Physiotherapy	Home	Wife	Yes
4	35	Male	Neuromuscular disease	-	Home		No
5	63	Female	Cerebral vascular accident	Elderly gymnastics	Home		Yes
6	51	Male	Chronic back pain	Fitness	Home		No
7	68	Female	Multiple sclerosis	Cycling (home trainer)	Home	Husband	Yes
8	61	Male	Cardiopulmonary disease	Fitness	Rehabilitation		Yes
9	33	Male	Transfemoral amputation	Wheelchair basketball	Home	Wife	Yes
10	62	Male	Chronic fatigue syndrome	Sports group (various activities)	Home		Yes
11	33	Female	Cerebral vascular accident	Sports group (various activities)	Home		Yes
12	43	Female	Artificial knee	Cycling	Sports location		No
13	52	Female	Chronic knee injury	Sit volleyball	Sports location		No
14	63	Female	Chronic back pain	Swimming	Sports location		No
15	73	Female	Chronic hip/knee injury	Swimming	Sports location		No
16	61	Male	Artificial knee	Sit volleyball	Sports location		No
17	52	Female	Chronic hip injury	Sit volleyball	Sports location		No
18	22	Female	Complex regional pain syndrome	Sit volleyball	Sports location		No
19	48	Female	Cerebral palsy	Swimming	Rehabilitation	Nurse	Yes
20	46	Male	Unclear diagnosis	Swimming	Sports location		No
21	51	Male	Balance disorder (unclear)	Swimming	Sports location		Yes

Notes: y = years; ^a = Participants with a history of inpatient rehabilitation, underwent their inpatient rehabilitation at least 3 years ago.

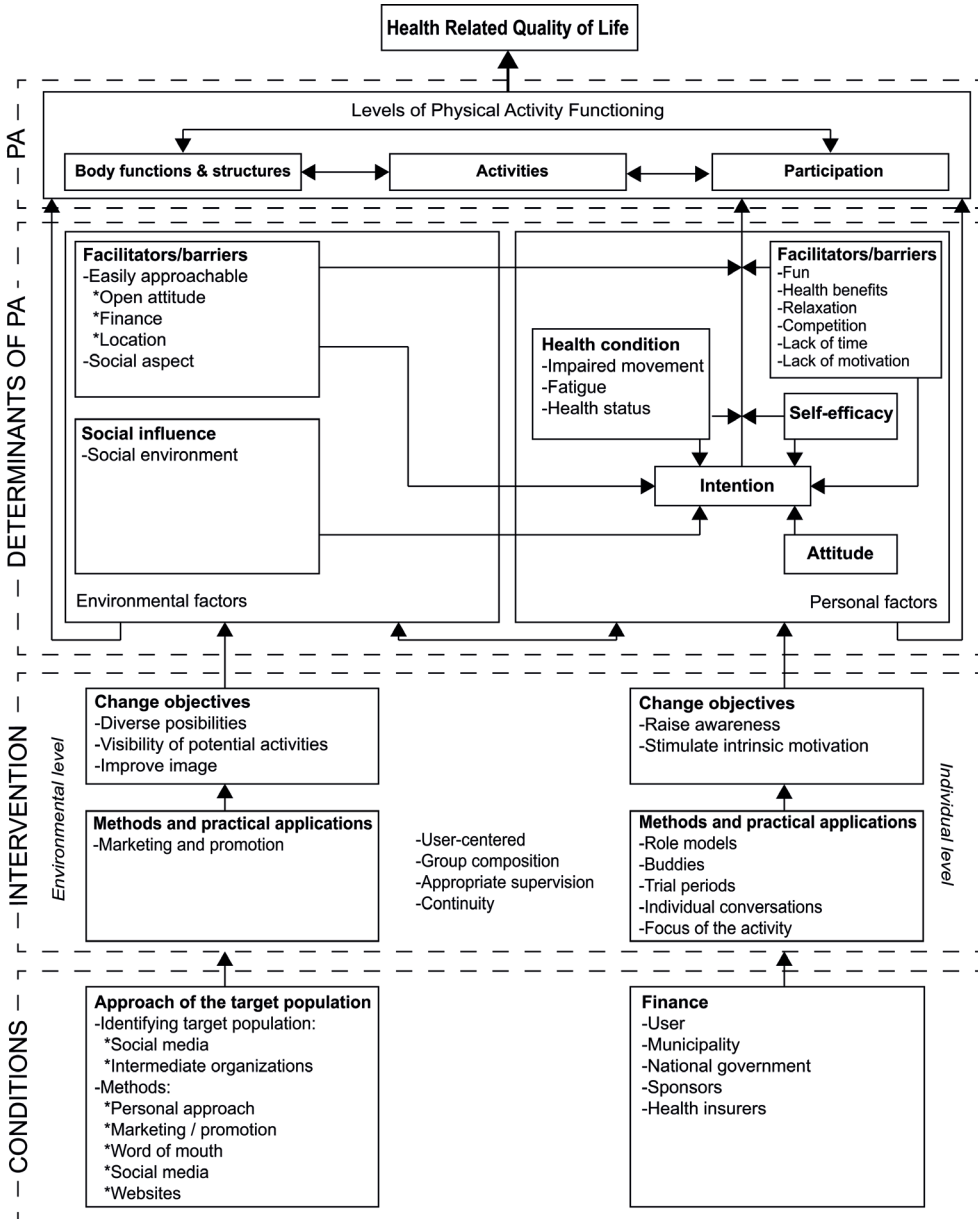


Figure 1: Themes resulting from the interviews summarised in the integrated PAD-IM model. The final model is composed from the PAD model ('PA' and 'Determinants of PA'), logic model of change of IM ('Intervention'), and findings of the current study ('Conditions'). The order does not impose any sequence of importance. PA = physical activity.

Figure 1 summarises the results of the interviews within the integrated PAD-IM model¹²⁵. In order to describe opportunities for approaching the target group and financing physical activity, approach of the target group and finance for an intervention are inserted as 'conditions' at the bottom of the model. The results are described following the model from top to bottom. Throughout the results section, major themes that are mentioned in the model are printed in italic.

Determinants of physical activity

The level of physical activity functioning is influenced by determinants of physical activity, which can be subdivided into personal- and environmental factors⁴¹. Participants indicated *fun*, *health benefits*, *relaxation*, and *competition* to stimulate them to participate in physical activity. *Fun* was considered as the most important facilitator by most participants. Furthermore, *health benefits*, including mental health, weight management, increasing cardiorespiratory fitness and muscle force were also often mentioned to facilitate physical activity participation.

"I experienced that when you are more active, having a lower limb prosthesis, keeping up your leg muscle mass, your balance and stability are way better than when you are inactive." (Subject 9, lower limb amputation)

Participants indicated *lack of time* and *lack of motivation* as barriers for participating in physical activity. Moreover, they indicated that lower health condition, which includes *impaired movement*, *fatigue* and lower *general health status* hampers participation in physical activity. Participants indicated that they experience fear of falling, reduced muscle power and fatigue, what keeps them from becoming active.

According to participants, activities that are *easily approachable* and include a *social aspect*, facilitate physical activity participation. Activities that are easily approachable have an open attitude towards new members, whereby they feel welcome to join the activity. Furthermore, *finance* (the activity should be as cheap as possible so that finance will not be a barrier), and *location* are elements of approachability. The location should be not too far away from where the person lives, and should have facilities as a lift and an adapted dressing room. *Social aspects* of in particular group activities are considered stimulating to participate in physical activity. Support from *social environment*, in particular family, stimulates people to become physically active. Some active participants mentioned that they would not have become physically active without the support of

their family. Therefore, some participants indicated that social environment should be involved in the intervention, for instance by participating in activities.

“Many people do not know how it feels (...). So we (physically active disabled people) should invite parents or family members to join and experience.” (Subject 17, chronic hip injury)

Intervention

According to the participants, at the level of the individual, the intervention should aim to *raise awareness* on the importance of being active, and that being active does not harm one’s health. Participants hold the National Sports Federation, sports- and patient associations and physicians responsible for emphasizing the importance of physical activity.

“I think it is important to explain very clearly that moving does not harm, because I know that many people do believe it does.” (Subject 14, chronic pain)

Moreover, the intervention should aim to stimulate *intrinsic motivation* since participants indicated that intrinsically motivated people are more likely to continue a physically active lifestyle compared to people who are not. Participants indicated that being physically active is the person’s own responsibility.

Role models, buddies, trial periods, individual conversations and *focus of the activity* were suggested as methods for accomplishing these intervention aims. *Role models*, either professional athletes or non-professional disabled people, active in a club in the region, can be used to intrinsically motivate people. *Buddies* who are members of a club that can contact and accompany the potential member during the first weeks, can lower the barrier to contact a club.

“Maybe it is not feasible, but you should link people. Suppose there is someone (...) who has to swim. Call us and say; (...) can you please contact that person? And that will maybe convince them.” (Subject 14, chronic pain)

Trial periods can be used for both raising awareness and stimulating intrinsic motivation, since people can experience what being physically active can offer them. *Individual conversations* by a coach (for instance a psychologist) were suggested for increasing

intrinsic motivation. According to the participants these conversations should focus on determining facilitators and barriers for the specific person, to stimulate the facilitators and provide ways to encounter the barriers. According to participants, *focus of the activity* should be on improving cardiorespiratory fitness and confidence in persons own abilities. Further, the intensity of activities should be gradually increased to improve endurance capacity and self-confidence.

According to the participants, at the environmental level the intervention should aim to offer *diverse possibilities* for physical activity, and increase the *visibility of potential activities*.

“And where it is located, (...) I do not know what kind of sports there are for impaired people.” (Subject 17, chronic hip injury)

Particularly the suitability of diverse activities for specific patient groups should be made visible, since the interviewed participants experienced that patients tend to think that they are not able to perform many activities. Furthermore, the intervention should aim to *improve image* of adapted physical activity. Participants suggested attracting *marketing and promotion* as methods to accomplish these intervention aims. Media attention can improve image of adapted physical activity and show which activities are suitable for which patient groups. Participants suggested that personal experiences of disabled people, already active, should form the base of a marketing campaign. Moreover, demonstrations, in which people can eventually participate, were mentioned as a form of *marketing and promotion*.

Furthermore, participants indicated that an intervention should be *user-centred*, implicating that the programme should be adjusted to the individual. The impairment should be taken into account in both deciding the activity as in decisions within the activity, for instance the intensity. Participants had a heterogeneous opinion regarding *group composition*. Some participants preferred integrating in non-disability physical activity groups, since this increases understanding from able-bodied people. However, a slight majority of the participants preferred groups specifically for disabled people, since experiences can be shared and people can better empathise with each other. Some participants suggested that groups should be composed of people from the same age because of the shared physical capacity and perceptions, whilst others enjoy the diversity of the group regarding age. Most participants indicated that groups can be composed of people with different diagnoses, however some participants mentioned it to be inconvenient in one group with people with intellectual disabilities. Most participants emphasised the importance of groups with the same functional level.

*“She speaks more at ease with twenty impaired people than with six bodybuilders.”
(Father of subject 2, neuromuscular disease)*

Participants indicated the importance of *appropriate supervision*. Participants suggested that trainers and coaches should be experienced in working with the target group, and could be for instance a physiotherapist. However, one participant mentioned that a trainer does not have to be experienced, as long as the trainer is enthusiastic. Lastly, *continuity* in supervision was mentioned as an important factor. Almost all participants indicated that they would benefit from a better referral from health care to organisations providing physical activity.

Conditions

A section conditions was added to the model (figure 1), which describes the approach of the target population and ways to finance physical activity. The approach can be divided into *identifying the target population*, and *methods* for approaching people. For identifying the target population, participants suggested *social media* and *intermediate organisations*. On *social media* there are pages and groups special for people with specific disabilities. The participants suggested several *intermediate organisations* as for instance patient organisations and health care organisations, as hospitals, rehabilitation centres and physiotherapists to be in contact with the target population.

“At first you need the people who refer patients, so professionals.” (Subject 13, chronic knee injury)

The participants indicated *personal approach*, *marketing and promotion*, *word of mouth*, *social media* and *websites* as methods to approach the target population. All participants suggested that personally approaching people by health care professionals or sports clubs would be most effective. One person mentioned that it is effective to contact people repeatedly, like commercial organisations do. However, he indicated that a *personal approach* is time intensive, hampering feasibility. Most of the participants who were physically active, came in contact with the sports club by means of *word of mouth*, via family, friends and fellow citizens. Moreover *websites* and *social media* were suggested for approaching the target population. Participants highlighted that the advantage of *social media* above *websites* is that it allows for directed marketing, by the use of groups special for specific impairments, while the information on websites will be only read when people are actively searching themselves.

"A website is the same as placing leaflets in a cabinet. When you are not drawing attention they are not going to look on your website. When I am not looking for wheelchair sports (...), I do not find it." (Subject 20, unclear diagnosis)

Participants indicated the *user, municipality, national government, sponsors and health insurers* as parties that should finance physical activity. Most of the participants who were physically active financed that themselves. In general, they agreed on that, since non-disabled people also have to finance their own activities. Some participants indicated that people feel more responsible for their activities when they finance the activities themselves.

"I think you may finance physical activity yourself, because than involvement will be created (...). Because when everything will be financed people are more likely to cancel the activity, I think." (Subject 11, cerebral vascular accident)

When adapted transport is required to enable a disabled person to participate in physical activity, this will be reimbursed by a transport subsidy from the *municipality*. It was suggested that disabled people do have higher costs, combined with mostly a lower income, therefore activities should be not too expensive. Some participants suggested that finance should be income dependent, in which the municipality partly compensates the costs of activities when people are not able to pay it themselves. Participants suggested *municipality* to be responsible for financing physical activity because medical devices are also reimbursed by *municipality*. Some municipalities do have subsidies for partial reimbursing physical activity in people with lower incomes. One of the participants indicated that *municipality* instead of *national government* should finance physical activity because of the decentralisation of health care in the Netherlands. However, another participant indicated that *national government* should finance physical activity, because physically active people do need less home care, which saves *national government* money.

"The national government should pay the rest, because if your fitness improves, then you maybe need 7 hours of home care instead of 10 hours." (Subject 2, neuromuscular disease)

One participant indicated that he partly reimbursed his activity costs through the *national government*, by subtracting the costs of his activities from the income tax. Moreover, participants suggested that the *national government* should facilitate appropriate sports facilities. Both *national government* and *municipalities* were mentioned to subsidise sports clubs. Members of sports clubs mentioned that the

sports clubs are financed by the donations from *sponsors*, often local companies. Lastly, participants indicated *health insurers* as being responsible for the finance of physical activity, since active people are more healthy, what saves health costs. According to the participants, *health insurers* pretend to stimulate active lifestyle, but should also partly finance physical activity. However, participants in this study stated it would be hard to get *health insurers* finance physical activity. Participants stated that partly financed physical activity is stimulating, because lack of finances cannot be an excuse for not being physically active.

“And then they talk about: ‘Yes, everybody should live more healthy’, but the health care insurance does not do anything to stimulate that.” (Subject 9, lower limb amputation)

Discussion

The aim of the current study was to explore ideas of the target population about a community-based intervention to stimulate physical activity in hard-to-reach physically disabled people. According to the target population an intervention should aim to raise awareness for the health effects of physical activity, stimulate intrinsic motivation, offer diverse activities, increase the visibility of the possible activities and improve the image of physical activity for physically disabled people. In order to accomplish this, an intervention should include buddies, trial periods, individual conversations with a coach, and apply appropriate marketing and promotion. The target population can be reached through social media and intermediate organisations, and should be personally approached by health professionals or via word of mouth. Physical activity should be financed by the user, government and health insurers.

Although this was not the primary focus of the current study, determinants of physical activity were reported by participants (figure 1). These determinants confirm existing literature on barriers and facilitators towards physical activity in physically disabled people^{29,30,32,118,138,139}. Additionally these determinants concur with those mentioned by professional experts in our previous research¹²⁵. However, participants of this study emphasised more frequently individual level determinants, rather than environmental level determinants. For instance they added relaxation and competition as individual level facilitators, and emphasised the positive effects of physical activity on health condition, where professionals did not report on effects of physical activity on health condition¹²⁵.

Regarding intervention methods (figure 1), in spinal cord injury patients, the use of role models as an intervention method was also suggested¹³⁹. Participants of the current study emphasised individual level intervention methods, where professionals emphasised environmental level intervention methods¹²⁵. Physically disabled people participating in the current study demanded an intervention to aim for increasing diversity and number of potential activities, which was not found in earlier research. In contrast, professionals indicated that the amount of potential activities was sufficient, but that potential activities should be made more visible¹²⁵. Possibly potential activities were not known by the target population and so they request more activities. Participants predominantly focussed on the importance of intrinsic motivation, and methods to accomplish this, such as individual coaching and focus of the activity. In contrast, professionals only briefly mentioned intrinsic motivation as being important¹²⁵. Professionals focussed more on the use of existing interventions, and highlighted the importance of improved collaboration between organisations¹²⁵. Participants strongly emphasised that the location should be not too far from their home, but the majority of the participants preferred group activities specifically for disabled people. This combination might not be possible in all areas. Moreover, participants mentioned that amongst others physicians are responsible to emphasise the importance of physical activity. However, the hard-to-reach population which is targeted by the intervention might not be in contact with a physician.

At the level of conditions (figure 1), the target population indicated that only the person involved is responsible for his or her physical activity, whereas professionals designated several people or organisations as responsible to stimulate physical activity in this population. Inconsistent with the focus on self-responsibility, participants in the current study mentioned multiple parties that should finance physical activity, as municipalities and health insurers. Through the current study, social media groups for specific diagnoses, were added as a method to identify the hard-to-reach target population. Together with intermediate organisations as patient organisations, as suggested by the target population, and organisations from social background and home care, as suggested by professionals¹²⁵, diagnose specific social media groups, could be a way to reach the hard-to-reach target population.

The interviews lasted 10 to 62 minutes. Although there are no strict guidelines for the duration of interviews, 10 minutes was extremely short, which could have affected the amount of data obtained^{140,141}. In general, interviews performed at home lasted longer compared to interviews performed at sports locations. It is suggested that participants spoke more at ease in home situations. In five interviews participants were assisted by family members, or a nurse. The presence of others during the interview might have

affected the opinions expressed by the participants¹⁴⁰. The current study focused on stimulating both daily physical activity and sports participation. Sports is defined as an activity involving physical exertion with or without a game or competition element with a minimal duration of 30 minutes for at least two times a week, where skills and physical endurance are either required or to be improved¹⁴². During the interviews, both terms are used. It could have been that participants focused either more on daily physical activity or more on sports stimulation, what could have limited the results. Interviewing people who are already active could possibly have introduced information bias, which could for instance explain the emphasis on self-responsibility for being physically active found in the current study.

Moreover the current study is limited, since only people from the northern part of the Netherlands are invited to participate, due to practical reasons. This part is more sparsely populated than the west of the country, where less sports facilities are available, and at a further distance¹⁴³. These differences could have influenced the transferability of the results to other parts of the country, and other countries. The authors suggest that determinants of physical activity, and ideas on an intervention (figure 1) as found in the current study are mostly general applicable for developed countries. However, conditions for an intervention (reach, finance and responsibility) are suggested to depend on national approaches to promote physical activity in disabled people, that differ between countries¹⁴⁴. Conditions should therefore be considered within the specific country prior to implementation of an intervention.

A strength of the current study is the heterogeneous background of participants regarding age, gender, impairment and physical activity participation. Hereby it is attempted to investigate different perspectives on physical activity promotion. Because of the heterogeneous population, 7 additional interviews were performed to ensure data saturation, but no new relevant information was obtained. A member check was performed after each interview, to increase the validity of the results. To increase reliability of the analyses, the first four transcripts were double coded, and coding was constantly discussed. The double coding and constant discussion during data analyses diminished interpretation bias, and thereby ensured reliability of the conclusions.

Future research should focus on the design of a community-based movement intervention for physically disabled people, based on the findings of current study and earlier research in professionals¹²⁵. Testing the implementation process and effectiveness of the intervention is recommended, in order to provide practical guidelines for the stimulation of physical activity in hard-to-reach physically disabled people.

Conclusion

According to the target population, an intervention to stimulate physical activity in physically disabled people should aim to raise awareness for the health effects of physical activity, stimulate intrinsic motivation, offer diverse activities, increase the visibility of the possible activities and improve the image of physical activity for physically disabled people. For instance individual coaching, role models and marketing are suggested as intervention methods. Hard-to-reach physically disabled people can be identified by social media and several intermediate organisations, and can be approached for instance by word of mouth, websites and marketing, in order to stimulate them to become physically active to gain health benefits.

