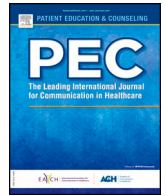




Contents lists available at ScienceDirect

Patient Education and Counseling

journal homepage: www.elsevier.com/locate/pec

Patient-centered innovation

Gaining actionable knowledge to improve local health-promoting capacities in long-term care support settings for people with intellectual disabilities

Kristel Vlot-van Anrooij^{a,*}, Jenneken Naaldenberg^a, Thessa I.M. Hilgenkamp^{b,c},
Annelies Overwijk^{d,e}, Koos van der Velden^f, Geraline L. Leusink^a

^a Department of Primary and Community Care, Intellectual Disabilities and Health, Radboud University Medical Center, 6500 HB Nijmegen, The Netherlands

^b Department of Physical Therapy, University of Nevada, Las Vegas, USA

^c Department of General Practice, Intellectual Disability Medicine, Erasmus MC University Medical Center, Rotterdam, The Netherlands

^d Research group Healthy Ageing, Allied Health Care and Nursing, Hanze University of Applied Sciences Groningen, The Netherlands

^e Department of Health Psychology, University of Groningen, University Medical Center Groningen, Groningen, The Netherlands

^f Department of Primary and Community Care, Radboud University Medical Center, 6500 HB Nijmegen, The Netherlands

ARTICLE INFO

Article history:

Received 8 May 2020

Received in revised form 29 January 2021

Accepted 19 May 2021

Available online xxxx

Keywords:

Health promotion

Long-term care

Intellectual disability

Settings approach

Health assets

Physical activity

Nutrition

Capacity building

ABSTRACT

Objective: People with intellectual disabilities (ID) are largely dependent on their environment to live healthily and, in this, ID-support organizations play a vital role. An environmental asset mapping tool for ID-support settings has been developed. This study aims to provide insight into whether or not the tool can provide a comprehensive view on assets in the system and actionable knowledge to improve health-promoting capacities in ID-support settings.

Methods: Fifty-seven users from four settings completed the tool on availability, user satisfaction, and dreams regarding social, physical, organizational, and financial assets.

Results: The findings provide a comprehensive view of available assets. Together with user satisfaction and dreams for improvements, they provide actionable knowledge for improving the health-promoting capacities of the settings, including: (1) how use of available assets can be improved, (2) the type of assets that should be enriched, and (3) the assets that can be added to the system.

Conclusion: The asset mapping tool provides a comprehensive view on assets in the system and actionable knowledge to improve health-promoting capacities in ID-support settings.

Practice implications: ID-support organizations can use the tool to generate actionable bottom-up knowledge for priority setting and implementing interventions to improve their health-promoting capacities.

© 2021 The Author(s). Published by Elsevier B.V.

CC-BY-NC-ND 4.0

1. Introduction

Support organizations for people with intellectual disabilities (ID) play a vital role in facilitating health and health promotion for people with ID [1–3]. They arrange (often) long-term everyday support in daytime and living accommodations for people with ID, who experience significant limitations in intellectual functioning and adaptive behavior [4]. People with ID face more lifestyle-related health problems and have unhealthier diets and lower physical activity levels than the general population [5–7]. Health-promotion

through ID-support organizations can help reduce health disparities [8–11]. Moreover, people with ID themselves have expressed the need for a supportive social and physical environment to be able to live healthily [12,13]. However, ID-support organizations face difficulties in embedding health promotion in their organization and activities [3,14,15].

Health promotion for people with ID has focused mainly on program-based interventions targeting individual behavior and may benefit from expanding its focus to the context of settings in which people engage in daily life [2,16,17]. As behavior patterns are created and sustained through the setting in which people engage, it is challenging to integrate in daily life what has been learned in programs. Recognition of the importance of context in health promotion for people with ID helps to change behavior and maintain newly adopted habits [2]. Studies focusing on the context where people

* Correspondence to: Radboud University Medical Center, Radboud Institute for Health Sciences, Department of Primary and Community Care, P.O. Box 9101, route 149, Nijmegen 6500 HB, The Netherlands.

E-mail address: kristel.vananoorij@radboudumc.nl (K. Vlot-van Anrooij).

<https://doi.org/10.1016/j.pec.2021.05.033>

0738-3991/© 2021 The Author(s). Published by Elsevier B.V.

CC-BY-NC-ND 4.0

with ID engage show that available health-promoting activities are mostly stand-alone activities that lack embedment in ID-support organizations' policies [16,17]. Furthermore, studies on organizational factors in ID-support settings state that a health promotion culture is often lacking and that staff members have training needs and lack clarity on roles and responsibilities regarding health promotion [3,14,15,18]. Gaining a more holistic view of how multifaceted factors in ID-support settings support a healthy lifestyle can help ID-support organizations to make a strategic action plan and improve the health-promoting capacities of their organization [2].

User involvement is key to gaining insight into a setting's multifaceted factors that influence the lifestyle of people with ID. Users have intimate knowledge of everyday practices, for example the assets that are perceived to support healthy living. Assets are protective or promoting factors that maintain and sustain health and wellbeing in a setting [20]. Also, users' ideas for improvement foster bottom-up organizational change that fits with users' needs and wishes [19–21]. To enable users of ID-support settings to identify assets supporting physical activity and healthy nutrition and share their ideas for change, an asset mapping tool was developed in a previous study, named *Discovering Health-promoting Assets in Settings for people with Intellectual Disabilities (DIHASID)* [22]. It focuses on social, physical, financial, and organizational assets for physical activity and healthy nutrition within ID-support settings and contains questions about asset availability, user satisfaction with those assets, and dreams for further improvements. Users of the setting, e.g. people with ID and care professionals, can complete the DIHASID tool. The tool aims to gain a bottom-up comprehensive overview of the health-promoting capacities of a residential or daycare setting and to create actionable knowledge. Further research is needed to test the capacity of the tool.

In this study, the DIHASID tool is applied to ascertain whether or not the tool can in practice provide a comprehensive view on assets in ID-support settings and actionable knowledge to improve their health-promoting capacities. The following research questions are answered:

- o Is the DIHASID tool able to provide a comprehensive view of social, physical, organizational, and financial assets for physical activity and healthy nutrition available in ID-support settings?
- o Is the DIHASID tool able to provide actionable knowledge to improve health-promoting capacities in ID-support settings?

2. Methods

2.1. Setting

This study was performed in residential and daytime support settings of Dutch ID-support organizations for people with moderate to profound ID. In the Netherlands, about 70,000 people with ID live in residential accommodations and another 20,000 persons use daytime accommodations [23]. Support ranges from ambulatory support for several hours a week, to day activity support, and to long-term residential support and care in accommodations provided by ID-support organizations [24]. These accommodations range from clustered group homes, to small-group living in apartments, and to single-family homes in neighborhoods [23]. In these residential accommodations, care professionals, trained in social work and/or assistant nursing, provide 24-hour support by assisting in personal, daily, social, and health care. In the day-activity accommodations, the care professionals provide recreational or unpaid labor activities for people with ID.

2.2. Participants and procedures

Four residential and/or daytime accommodations for adults with moderate to profound ID from four different ID-support providers

were recruited. Contact persons from six regional ID-support organizations assisted in recruitment by disseminating information flyers among team leaders in these settings. If they were interested, the researcher contacted them to discuss participation. Users of the setting, people with ID, proxy respondents for people with ID, care professionals, and team leaders who met the inclusion criteria received an information letter. Inclusion criteria for people with ID were: age ≥ 18 years with moderate to profound ID. For people with ID for whom verbal communication was difficult, proxy respondents were sought. Inclusion criteria for proxy respondents were the same as for the care professionals and team leaders: engaging for at least 2 months regularly at the setting where the study took place. Written informed consent was obtained. For people with ID who had a legal representative, that representative also signed the consent form.

Participants completed the DIHASID tool on paper or online. To ascertain the credibility of the results, a participant check was conducted in a group meeting at each setting within two weeks of completion of the DIHASID tool. All participants were invited for this group meeting which was led by the first author. The participant check was conducted by discussing the accuracy and recognizability of the summary and the infographic of the results of the DIHASID tool. Also, differences in responses regarding availability of assets were discussed.

The study was conducted according to the principles of the Declaration of Helsinki and the EU General Data Protection Regulation. The Medical Research Ethics Committee of Radboud University and Medical Center approved this study (registration number: 2018-4408). Data were collected between January and April 2019.

2.3. Development DIHASID tool

The DIHASID tool is an inclusive bottom-up tool for environmental asset mapping in ID-support settings. It helps users of a setting to identify and reflect on available assets and to identify wishes regarding environmental support for physical activity and healthy nutrition [22]. The tool is underpinned by the settings approach, a whole systems approach aimed at embedding health within a setting's routines and culture [25]. The topics in the DIHASID tool are based on the Healthy Settings for People with Intellectual Disabilities (HeSPID) framework, a conceptual framework on assets for physical activity and healthy nutrition in ID-support settings developed by academics, people with ID, and proxies of people with ID [26,27]. The DIHASID tool's development process is described in a previous study in which the tool is included as an appendix [22].

The DIHASID tool consists of 37 questions about: (1) participant and general setting characteristics, (2) social assets for healthy living including the social network, types of support, and values regarding healthy living, (3) physical assets for healthy living including tools, facilities, accessibility, and person–environment fit, and (4) financial and organizational assets for healthy living. The tool enquires about availability of, and user satisfaction with, available assets and wishes/dreams. Question types include tick-box questions, multiple choice questions (3-point smiley scale and 5-point Likert scale for questions for care professionals and proxies), and open questions. The tool can be completed in approximately 30 min by people with mild to moderate ID assisted by a support person, proxy respondents for people with severe/profound ID, care professionals, and team leaders. The questions are tailored to the type of accommodation (residential or daytime accommodation) and type of respondent (person with ID, proxy respondent, professional caregiver, team leader).

2.4. Data analysis

The tick-box and user satisfaction answers were analyzed using descriptive analysis in IBM SPSS (version 25). The answers to the

dreams questions were grouped based on its content and then described per type of asset (social, physical, financial and organizational).

To gain an overview of the available social, physical, organizational, and financial assets at each setting, the tick-box answers were assessed. If ≥ 1 participant in a setting ticked the box indicating that an asset was present, the asset was included in the list of assets at the setting.

To gain an overview of the actionable knowledge gained through the DIHASID tool, the answers on user satisfaction and dreams and recordings of the participant checks were thematically analyzed. For user satisfaction, median scores of the multiple-choice questions for each theme were calculated per setting. Furthermore, a graphical overview was developed for each setting by calculating a score for the themes: total available social assets, user satisfaction with social assets, total available physical assets, user satisfaction with physical assets, perceived financial assets, and user satisfaction with organizational assets. For total available assets, the available assets per theme were counted. For each theme, the maximal score was calculated by adding up the maximal score for each question relating to that theme. The score on that theme for each setting was calculated as a percentage: score on theme for setting X / maximum score *100.

3. Results

The participants' answers to the DIHASID tool resulted in overviews per setting on availability, user satisfaction, and dreams for improvements regarding assets for physical activity and healthy nutrition. This information is described below. Combined, this information provides actionable knowledge for health promotion practice, which is described in the final paragraph of the results section.

3.1. General characteristics of settings and participants

This study was performed in four ID-support settings of four different ID-support providers. In total, 74 persons completed the DIHASID tool to provide insight into the health-promoting capacities in these four settings, see [Table 1](#). At all locations more than half of the employees and clients involved participated or were represented.

3.2. Availability of assets

The DIHASID tool provides setting-level information on availability of social and physical assets, including potential stakeholders for support, types of support, aids for physical activity and healthy nutrition at the setting, nearby facilities, and ease of travel to nearby facilities. A complete overview is provided in [Appendix A](#).

All social assets enquired about were available at ≥ 1 setting. Friends, clients, volunteers, and a massage therapist were available to support healthy living at only one or two of the four settings. All settings provided a large variety of types of support from care professionals and health professionals to people with ID (at least 12 out of 19 types of support), ranging from doing things together, to helping with choosing, and help from health professionals with exercise activities. Doing certain activities together, explaining things, giving tips, or displaying role-model behavior were not provided at all settings. Care professionals also received a variety of types of support from health professionals, but inspiring materials for healthy food or client-specific advice regarding nutrition were not available at all settings. In the support to people with ID, several levels of autonomy are given in decision making about healthy living. In one setting, clients could not choose themselves (with or without tips), but, in three settings, care professionals and clients

Table 1
Setting and participant characteristics.

Setting characteristics	Setting 1	Setting 2	Setting 3	Setting 4
Type of setting;				
1. residential accommodation	Yes	Yes	No	Yes
1. daytime care accommodation	Yes	No	Yes	No
Place of setting;				
1. setting in neighborhood	Yes	No	No	No
1. setting on care organization complex	No	Yes	Yes	Yes
Employees (n)	21	7	8	9
Clients (n)	11	5	12	12
Clients' characteristics:				
1. Age (min–max)	20–70	40–60	15*–45	12*–33
1. Spasms	Yes	Yes	No	Yes
1. Epilepsy	Yes	Yes	Yes	Yes
1. Autism	Yes	Yes	Yes	Yes
1. Tube feeding	Yes	No	No	No
1. Impaired vision or blind	Yes	Yes	Yes	Yes
1. Hard of hearing	Yes	Yes	No	Yes
1. Wheelchair use	Yes	Yes	No	Yes
1. Not allowed on the road by themselves	Yes	Yes	Yes	Yes
Participants:				
Total (n)	25	12	12	15
People with ID (n)	5	0	2	2
Proxy respondents (n)	3	5	4	4
Daily caregivers and team leaders (n)	17	7	6	9

*Clients under the age of 18 were not invited to participate in this study.

choose together, with possible restrictions via the options to choose from.

Most of the physical assets enquired about are available at ≥ 1 setting. All settings have enough space for physical activity and accessible buildings for people with physical limitations. The following aids and equipment for physical activity were not available at ≥ 1 setting: stationary bicycle, activity-stimulating games, and a book with ideas about exercise activities. In the area surrounding the settings, many facilities for healthy living were available. Shops, supermarkets, hydro-therapy baths, and sports fields were not within walking or biking distance (15 min) of one or two settings.

3.3. User satisfaction with assets

On user satisfaction, the results from the DIHASID tool generate an overview of social, physical, financial, and organizational assets in the four settings. A complete overview can be found in [Appendix B](#).

The social assets mostly perceived as capable of improvement were: support in making personal choices and discussions about healthy living. Help for clients from health professionals was mostly perceived as good for clients and satisfactory for care professionals. In all settings, users perceived that there was often time to focus on food and eating time and sometimes time to motivate clients to be physically active and to talk about healthy living. Preconditions for a team to support healthy living that were perceived as neutral include: sufficient knowledge and skills, clear agreements with clients' family, and a shared vision on healthy living. Perceptions were more positive about the team's knowledge about providing clients with personalized support and clear mutual agreements.

User satisfaction with physical assets was mostly positive. The aids for healthy living at the settings and settings nearby for healthy food and drinks, physical activity, and sports were perceived as good. Activities for healthy living and the embedment of healthy living in day and evening programs were perceived as capable of improvement. Participants perceived ease of travel as safe and easy. The fit between clients' needs and the environment was perceived as enough for nearby places and capable of improvement for things available in the settings.

Participants' user satisfaction with financial and organizational assets was moderate or satisfactory. Whereas individual budgets and organizational budgets for healthy living were perceived as moderate, settings' budgets were perceived as satisfactory. The organizational assets mostly perceived as moderate were: collaboration with clients in creating health-promoting settings, collaboration with municipalities and sports providers, organizational guidelines on knowledge needed by employees and clients about healthy living, and coaching/education for care professionals from other employees. The organizational assets mostly perceived as satisfactory were: coaching/education for care professionals from external parties, attention on healthy living and differences between target groups in the organization's policy and communication, and attention on healthy living in development plans for people with ID.

3.4. Dreams for improvements

The DIHASID also generated dreams for improvements regarding social ($n = 72$), physical ($n = 37$), and financial and organizational assets ($n = 23$).

Dreams on social assets focused mainly on types of support and preconditions for support. The types of support wished for included: more support through keeping an overview of clients' nutritional intake, cooking, providing healthy foods and variety in meals, regulating intake of unhealthy foods. Also, participants wished for more opportunities for clients to be physically active; this relates to both physical assets and care professionals' competence to integrate physical activity in daily routines. In general, participants wished for support and activities that are better tailored to clients' abilities and more client involvement in decision making. Care professionals' wishes on preconditions for social support included: knowledge on healthy living, motivation skills, ability to tailor support and embed healthy living in daily routines, role-model behavior, a positive attitude towards healthy living, and support from health professionals. Other dreams about preconditions focused on care professionals having more time to support healthy living, a shared vision, mutual agreements, and acting uniformly as care professionals and family.

Dreams about physical assets included the wish for more aids: treadmill, Wii game computer, game materials, adjusted swings, sensory stimulation materials in garden, adjusted bikes, multi-sensory room, vegetable garden, and a healthy food book. Also, participants wished that the available aids would receive more attention and be used more often. Dreams about facilities in the nearby area for healthy living included: a fitness room, a soccer field, activity-stimulating materials in the swimming pool, a garden in the village with physical-activity-stimulating elements, a restaurant with healthy menus, and a supermarket with many healthy products. Access to facilities and a range of activities in which clients can participate at those settings were also wished for.

Dreams regarding financial and organizational assets focused on what participants would like to spend money on: aids and games that support physical activities, exercise activities, healthy food, and personnel to support healthy living. Also, participants wished for more attention on healthy living in the organization and its policy. Not only did participants want their organization to make its vision on healthy living clear, but also they wanted enough attention to be given to the preconditions to support healthy living. Lastly, they wished for more awareness regarding healthy living among personnel. For example, training could be used to raise awareness of the occasions that present opportunities to focus attention on healthy living and the aids that can be used.

3.5. Actionable knowledge to improve health-promoting capacities in ID-support settings

The combined information on asset availability, user satisfaction, and dreams provides ideas on which areas and what kinds of changes

can improve the health-promoting capacities in the ID-support settings. Areas for improvement are visualized in Fig. 1, which provides a graphical overview per setting on availability of, and user satisfaction with, the different types of assets. For each location, this provides insight into differences between availability and user satisfaction regarding social and physical assets. Also, it identifies the domain (social, physical, financial, and/or organizational) in which improvements can be made. Regarding the content of potential change, it provides insight into how the health-promoting capacities can be built: firstly, how available assets can be tailored to users' needs – for example, how support can be better tailored to the autonomy that clients are able to have; secondly, how available assets can be used in a different and better way – for example, how health professionals can use part of their time to empower care professionals to support clients in doing movement exercises, so that clients receive more support. Lastly, it identifies the assets that can be added to the system to make dreams regarding that theme come true. During the participant check, users of the settings confirmed that the results of the DIHASID tool provided actionable knowledge. In each setting, a group meeting was held in which participants confirmed that the summary of the results provided an accurate description of the setting and actionable knowledge to improve health-promoting capacities. They reflected on this by saying that the results provide an overview of where changes are needed and provide ideas on what to change. Also, they stated that the ideas of other users inspired them to think about more ideas for improvements.

4. Discussion and conclusion

4.1. Discussion

This study aimed to provide insight into whether or not the DIHASID tool can provide a comprehensive view on assets in ID-support settings and generate actionable knowledge to improve health-promoting capacities. By completing the DIHASID tool in four settings, the 57 participants provided an overview of availability, user perceptions, and dreams regarding social, physical, organizational, and financial assets that they perceived as comprehensive for the setting in which they engage. Although studies exist on user perspectives on factors that enable or hinder healthy living [3,12,15,28–30], this is the first study to take a settings approach to the multifaceted factors in the context of ID-support organizations. The DIHASID provides three types of actionable knowledge that can be used in a settings approach for health promotion. Firstly, an overview of how available assets are perceived and ideas for changing the use of existing assets or linking them better with other assets. Secondly, an overview of the type of asset enrichment needed in the system. In this study, this encompassed budget, time, attention, and support persons' capacities regarding healthy living; this aligns with literature on barriers to health promotion for people with ID [14,30–33]. Thirdly, insight has been gained into the components that should be added to increase the health-promoting capacity of the system. These insights are key for ID-support organizations to take the current context into account in building a bottom-up settings approach to strategically embed adaptations in the system and improve health-promoting capacities in settings.

A major strength of this study is that most users engaging in the four settings completed the DIHASID tool; this strengthens the reliability of the overview of user perspectives. This, together with the different question types and probing for different types of assets, creates a holistic overview of the four settings. Furthermore, the credibility of the outcomes of the DIHASID tool was confirmed by a participant check. Such a complete overview of the current situation is useful for asset-based development in practice [34].

Interpretation of the results is subject to some limitations however. As many of the people with ID engaging in the four settings had a severe/profound ID, they were not able to participate. However, for

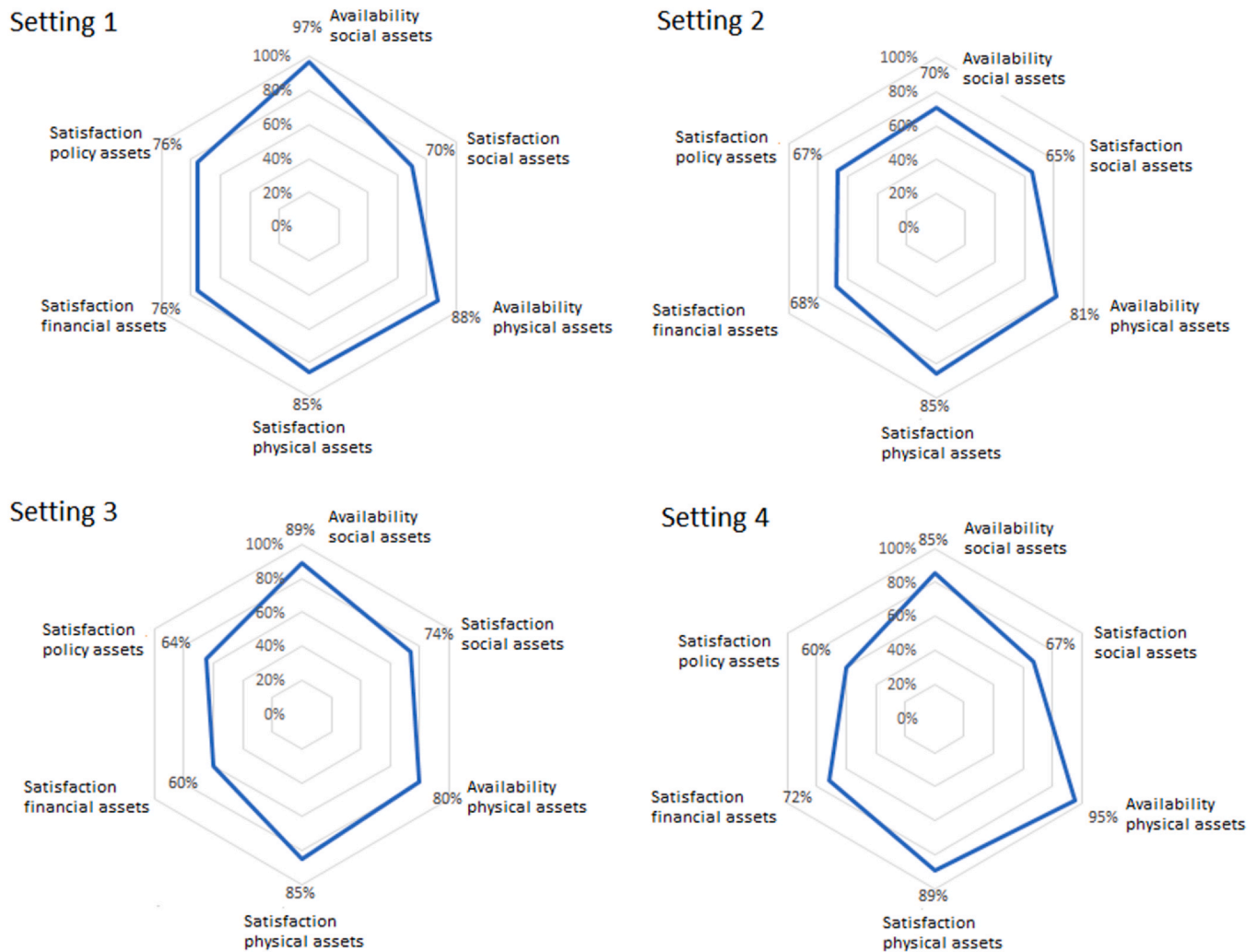


Fig. 1. Graphical overview of available and perceived assets at the four settings.

these persons, proxy respondents replied on their behalf and people with ID who did participate could share their perspective, as the DIHASID tool was adjusted to their needs [22]. Also, a much-discussed issue in asset-based approaches is the lack of overview on power relations between stakeholders in a setting [35,36], which is important in determining a strategy for implementing a settings approach [37]. Although the users of a setting are often not the stakeholders who have power over distribution of resources, enabling them to share their perspective can lead to empowerment [38]. Also, stakeholders who possess this power can use the results of the DIHASID as bottom-up input on the current situation/wishes to determine the best strategy to implement a settings approach. Lastly, this study focused on the Dutch context of care and provides an overview for four ID-support settings. Although the results cannot be generalized to other care settings or countries, the results provide insight into the type of information that the DIHASID tool provides. This can help stakeholders in practice and researchers in other settings to determine how useful it is to apply this tool.

In future research, the DIHASID tool could be used as a first step in participatory action research aimed at increasing health-promoting capacities in ID-support settings. The tool provides information for understanding the context and for setting the priorities needed to define actions to take in such an approach [39]. Evaluation of the process and outcome of those actions can provide lessons for practice and research [35,39]. Furthermore, future

research could explore how a settings approach in ID-support settings can facilitate other positive lifestyle factors such as sleep.

4.2. Conclusion

In conclusion, the DIHASID tool is able to provide a comprehensive picture of user perspectives on assets and actionable knowledge to improve health-promoting capacities in ID-support settings. Completing the tool provides a holistic overview of available social, physical, organizational, and financial assets, how they are perceived by users, and in what way users think that the health-promoting capacities in a setting can be improved. This provides actionable knowledge on: (1) how available assets can be used in a better way, (2) the type of assets that should be enriched, and (3) the assets that should be added to the setting.

4.3. Practice implications

The DIHASID tool can be used in practice to facilitate users and policymakers to take a bottom-up approach for improving health-promoting capacities in ID-support settings. For users, completing the DIHASID tool and receiving an overview of available assets can help them recognize and utilize available assets and express their wishes for change. In projects where users were involved in decision making and collaborative action to make changes to their setting,

this empowered the users and had a positive impact on their self-efficacy and self-esteem [40]. Thus, involving people with ID in decision making and collaborative action might empower them and contribute to the exercising of their right to have a say about matters that affect them [41]. Policymakers can use the DIHASID results to apply a bottom-up approach for setting priorities, building a strategic action plan, and intervening through a settings approach to increase health-promoting capacities in ID-support settings [2,20,42,43].

Funding

This work was supported by ZonMw (Nationaal Programma Gehandicapten, grant number: 80-84500-98-118) and the Academic Collaborative Stronger on Your Own Feet.

CRedit authorship contribution statement

Kristel Vlot-van Anrooij: Conceptualization, Methodology, Data curation, Formal analysis, Writing - original draft, Writing - review & editing. **Jenneken Naaldenberg:** Conceptualization, Methodology, Funding acquisition, Supervision, Writing - review & editing. **Thessa**

I. M. Hilgenkamp: Funding acquisition, Supervision, Writing - review & editing. **Annelies Overwijk:** Conceptualization, Methodology, Writing - review & editing. **Koos van der Velden:** Supervision, Writing - review & editing. **Geraline L. Leusink:** Funding acquisition, Supervision, Writing - review & editing.

Acknowledgements

The authors are grateful for the contribution of the study participants. Also, they would like to thank Anneke van der Crujsen and Henk Jansen who participated as co-researchers in this project. They shared their experiential knowledge in the design of the study and in the development of the summary for the participant check to enable meaningful participation by people with ID. Lastly, they would like to thank ZonMw and the Academic collaborative Stronger on Your Own Feet for funding this study.

Declaration of interest

None.

Appendix A. Availability of social and physical assets at the four settings

Available social assets	Setting				Available physical assets	Setting			
	1	2	3	4		1	2	3	4
Stakeholders that help clients with healthy living					Aids for physical activity at setting				
Care professionals	1	1	1	1	Yard in which to exercise	1	1	1	1
Family	1	1	1	1	Enough space inside to do exercises	1	1	1	1
Clients or fellow residents	1	0	0	1	A hall or space for engaging in physical activity	1	1	1	1
Friends	1	0	0	0	MSE space	1	0	1	1
Volunteers	1	0	0	0	Stationary bicycle	0	0	0	0
An attendant who specifically helps with healthy living	1	0	0	0	Bicycle or buddy bicycle	1	1	1	1
Doctor	1	1	1	1	Bicycle for the wheelchair	0	0	1	1
Physiotherapist	1	1	1	1	Book with ideas about exercise activities	1	0	1	0
Exercise specialist	1	1	1	1	Exercise equipment	1	1	1	1
Occupational therapist	1	1	1	1	Games in which one needs to move	1	0	1	1
Masseur	0	1	0	0	Patient elevator	1	0	1	1
Dietician	1	1	1	1	Building without thresholds	1	1	1	1
Speech therapist	1	1	1	1	Wide doors	1	1	1	1
Types of help for clients from stakeholders					Aids for healthy nutrition at setting				
Sports	1	0	1	1	Kitchen and cooking supplies	1	1	1	1
Physical activity	1	1	1	1	Meal service	1	1	0	1
Moving throughout the day	1	1	1	1	Meal-in-a-box or groceries are provided	1	1	1	1
Grocery shopping	1	0	1	1	Vegetable garden or fruit trees	1	1	0	0
Cooking	1	1	1	1	Healthy food and drink at home	1	1	1	1
Eating together	1	1	1	1	Foods list	1	0	1	1
Talking about healthy living	1	0	0	1	Recipe book	1	0	1	1
Making agreements about healthy living	1	0	1	1	Distance to facilities for healthy living near setting*				
Encouraging healthy living	1	1	1	1	*1 = car distance, 2 = biking distance, 3 = walking distance				
Explaining things about healthy living	1	0	1	1	[Home/Daytime support center]	3	3	3	3
Supporting by giving tips about healthy living	1	0	1	1	Supermarket	3	3	1	3
Showing others what healthy living looks like	1	0	1	1	Shops	3	3	0	3
Help with going to an exercise activity	1	1	1	1	Swimming pool	3	3	3	3
Help with getting dressed for sports	1	1	1	1	Hydro-therapy baths	0	3	0	3
Help choosing an exercise or sports activity	1	1	1	1	Riding stables	2	3	3	3
Help choosing food and drinks	1	1	1	1	Gymnasium, sports hall, or fitness space	2	3	3	3
Others buying healthy food and drink	1	1	1	1	Playground or outdoor exercise area	3	3	3	3
Serving food and pouring drinks	1	1	1	1	Sports field	3	0	3	3
Others prepare breakfast, lunch, and/or dinner	1	1	1	1	Area for walking and cycling	3	3	3	3
Exercise activities from health professionals	1	1	1	1	Green space for walking or cycling	3	3	3	3
Movement exercises from health professionals	1	1	1	1					
Assisted exercise from health professionals	1	1	1	1					
Information and tips about exercising from health professionals	1	1	1	1					
Information and tips about healthy food and drinks from health professionals	1	1	1	1					
Cooking classes from health professionals	1	1	0	0					
Advice from health professionals when healthy eating is difficult	1	1	1	1					

Types of support with decision making

Clients choose themselves, they do not receive help	1	0	0	0
Clients choose themselves, others give tips	1	0	1	0
Care professionals and clients choose together	1	0	1	1
Care professionals say what a client can choose from; clients choose what they want	1	1	1	1
Care professionals consider client preferences	1	1	1	1
Care professionals make the choice for the client	1	1	1	1

Health professionals who support care professionals

Physiotherapist	1	1	1	1
Exercise specialist	1	1	1	1
Occupational therapist	0	1	1	1
Speech therapist	1	1	1	1
Dietician	1	1	1	1
General practitioner (GP)	1	1	1	1
Intellectual disability physician	1	1	1	1

Types of support for care professionals from health professionals

Exercise aids	1	1	1	1
Exercise options and motivating clients	1	1	1	1
Ways to offer support for the exercises the clients have been given by physiotherapist or exercise specialist	1	1	1	1
Inspiring materials to use (exercise folder, exercise bag) to motivate clients to engage in physical activity	1	0	1	1
Inspiring materials to use (such as cooking workshops, videos, menus) to create healthy meals	1	0	0	0
Ways to make eating easier for clients with problems swallowing	1	1	0	1
Ways food can be fine-tuned to what the clients need	1	1	0	1

Appendix B. Median score of perceptions on social, physical, organizational, and financial assets for healthy living

	Setting 1	Setting 2	Setting 3	Setting 4
Social assets				
Time that care professionals have to motivate clients to move ¹	sometimes	sometimes	often	sometimes
Time that care professionals have to focus on food and eating time ¹	often	often	often	often
Talking about healthy living with clients and care professionals ¹	sometimes	sometimes	sometimes	sometimes
Help in making personal choices regarding healthy living ²	can be improved	can be improved	good	can be improved
Perception of discussions about healthy living ²	good	good	can be improved	can be improved
Help with healthy living from care professionals, clients, and volunteers ²	can be improved	can be improved	good	good
Help with healthy living from family and friends ²	can be improved	can be improved	can be improved	can be improved
Help with healthy living from health professionals ²	good	can be improved	good	good
Assistance for care professionals from healthcare professionals ³	satisfactory	moderate	satisfactory	satisfactory
The team has sufficient knowledge and skills in relation to healthy living ⁴	neutral	neutral	agree	neutral
The team has sufficient knowledge about every client, so personalized support can be offered for healthy living ⁴	agree	agree	agree	neutral
The team has clear mutual agreements about supporting clients in relation to healthy living ⁴	agree	neutral	neutral	neutral
The team has clear agreements with clients' family about providing support in relation to healthy living ⁴	neutral	neutral	neutral	neutral
The team has a shared vision of healthy living ⁴	neutral	neutral	neutral	neutral
Physical assets				
Perception of aids for healthy living ²	good	can be improved	good	good
Perception of locations nearby for healthy food and drinks ²	good	can be improved	can be improved	good
Perception of locations nearby for physical activity and sport ²	good	good	good	good
Perception of activities for healthy living ²	can be improved	good	can be improved	can be improved
Perception of embedment of healthy living in day and evening program ²	can be improved	can be improved	can be improved	can be improved
Perception of safety in going to nearby places ⁵	can be safer	safe	can be safer	can be safer
Perception of ease in going to nearby places ⁶	easy	easy	easy	easy
Is what clients need available at the setting ⁷	could be more	could be more	enough	could be more
Is what clients need available near the setting ⁷	enough	enough	enough	enough
Financial assets				
Individual budgets for healthy living ³	moderate	satisfactory	moderate	moderate
Setting's budget for healthy foods and tools for healthy foods ³	satisfactory	moderate	moderate	satisfactory
Setting's budget for physical activity, exercise equipment, and movement aids ³	satisfactory	satisfactory	moderate	satisfactory
Organizational budget for healthy living and personnel capacity to support clients with healthy living ³	satisfactory	moderate	moderate	moderate
Organizational assets				
Attention on healthy living in organization's policy ³	satisfactory	satisfactory	moderate	satisfactory

Attention on healthy living in organization's communication ³	satisfactory	moderate	moderate	moderate
Collaboration of organization with municipalities and sports providers ³	satisfactory	moderate	moderate	very un-satisfactory
Attention on wishes of different target groups in policy ³	satisfactory	satisfactory	satisfactory	satisfactory
Involvement of clients in creating health-promoting settings ³	moderate	moderate	moderate	moderate
Attention on healthy living in client's development plan ³	satisfactory	satisfactory	satisfactory	satisfactory
Organizational guidelines on knowledge needed by employees and clients about healthy living ³	moderate	un-satisfactory	moderate	un-satisfactory
Coaching and education for care professionals from other employees about supporting healthy living ³	satisfactory	moderate	moderate	moderate
Coaching and education for care professionals from external parties about supporting healthy living ³	satisfactory	satisfactory	Un-satisfactory	satisfactory

¹ never = sometimes | often | always,

² good | can be improved | bad,

³ very unsatisfactory | unsatisfactory | moderate | satisfactory | good,

⁴ completely disagree | disagree | neutral | agree | completely agree,

⁵ safe = can be safer | needs to be safer,

⁶ easy | could be easier | needs to be easier,

⁷ enough | could be more | needs to be more

References

- [1] Friedman C, Rizzolo MC, Spassiani NA. The impact of organizational supports on the person-centered health of people with intellectual and developmental disabilities. *J Policy Pract Intellect Disabil* 2020;17:70–8. <https://doi.org/10.1111/jppi.12320>.
- [2] Marks B, Sisirak J. Health promotion and people with intellectual disabilities. In: Taggart L, Cousins W, editors. *Health promotion for people with intellectual and developmental disabilities*. Maidenhead: Open University Press/McGraw-Hill; 2014. p. 17–29. <https://doi.org/10.1177/1744629514532577>.
- [3] O'Leary L, Taggart L, Cousins W. Healthy lifestyle behaviours for people with intellectual disabilities: an exploration of organizational barriers and enablers. *J Appl Res Intellect Disabil* 2018;31:122–35. <https://doi.org/10.1111/jar.12396>.
- [4] RL Schalock, Borthwick-Duffy, SA, Bradley, VJ, Buntinx, WHE, Coulter, DL, Craig, EM et al., *Intellectual disability: definition, classification, and systems of supports*. 11th ed. Washington, DC: American Association on Intellectual and Developmental Disabilities; 2010.
- [5] Ouellette-Kuntz H. Understanding health disparities and inequities faced by individuals with intellectual disabilities. *J Appl Res Intellect Disabil* 2005;18:113–21.
- [6] Haverkamp SM, Scandlin D, Roth M. Health disparities among adults with developmental disabilities, adults with other disabilities, and adults not reporting disability in North Carolina. *Public Health Rep* 2004;119:418–26. <https://doi.org/10.1016/j.phr.2004.05.006>.
- [7] Schroyen Lantman-de Valk HMJ. Health in people with intellectual disabilities: current knowledge and gaps in knowledge. *J Appl Res Intellect Disabil* 2005;18:325–33. <https://doi.org/10.1111/j.1468-3148.2005.00265.x>.
- [8] Emerson E. Underweight, obesity and exercise among adults with intellectual disabilities in supported accommodation in Northern England. *J Intellect Disabil Res* 2005;49:134–43. <https://doi.org/10.1111/j.1468-3148.2005.00265.x>.
- [9] Humphries K, Traci MA, Seekins T. Nutrition and adults with intellectual or developmental disabilities: systematic literature review results. *Intellect Dev Disabil* 2009;47:163–85.
- [10] Hilgenkamp TIM, Reis D, van Wijck R, Evenhuis HM. Physical activity levels in older adults with intellectual disabilities are extremely low. *Res Dev Disabil* 2012;33:477–83. <http://dx.doi.org/10.1016/j.ridd.2011.10.011>.
- [11] Hsieh K, Hilgenkamp TI, Murthy S, Heller T, Rimmer JH. Low levels of physical activity and sedentary behavior in adults with intellectual disabilities. *Int J Environ Res Public Health* 2017;14. <https://doi.org/10.3390/ijerph14121503>.
- [12] Kuijken NMJ, Naaldenberg J, Nijhuis-van der Sanden M, Schroyen Lantman-de Valk H. Healthy living according to adults with intellectual disabilities: towards tailoring health promotion initiatives. *J Intellect Disabil Res* 2016;60:228–41. <https://doi.org/10.1111/jir.12243>.
- [13] Frey GC, Buchanan AM, Sandt DD Rosser. "I'd rather watch TV": an examination of physical activity in adults with mental retardation. *Ment Retard* 2005;43:241–54. <https://doi.org/10.1123/apaq.16.2.126>.
- [14] Kuijken NMJ, Vlot-van Anrooij K, van Schroyen Lantman-de Valk HMJ, Leusink G, Naaldenberg J, Nijhuis-van der Sanden MW. Stakeholder expectations, roles and responsibilities in Dutch health promotion for people with intellectual disabilities. *Health Promot Int* 2018. <https://doi.org/10.1093/heapro/day059>.
- [15] Spassiani NA, Meisner BA, Abou Chacra MS, Heller T, Hammel J. What is and isn't working: factors involved in sustaining community-based health and participation initiatives for people ageing with intellectual and developmental disabilities. *J Appl Res Intellect Disabil* 2019;32:1465–77. <https://doi.org/10.1111/jar.12640>.
- [16] Steenbergen HA, Van der Schans CP, Van Wijck R, De Jong J, Waninge A. Lifestyle approaches for people with intellectual disabilities: a systematic multiple case analysis. *J Am Med Dir Assoc* 2017;18:980–7. <https://doi.org/10.1016/j.jamda.2017.06.009>.
- [17] Kuijken NMJ, Naaldenberg J, Vlot-van Anrooij K, Nijhuis-van der Sanden MW, Van Schroyen Lantman-de Valk HMJ, Leusink GL. Integrating health promotion in everyday life of people with ID - extent to which current initiatives take context into account. *Intellect Dev Disabil* 2020;58:170–9. <https://doi.org/10.1352/1934-9556-58.2.170>.
- [18] Ca Melville, S Hamilton, S Miller, S Boyle, N Robinson, C. Pert et al., *Carer knowledge and perceptions of healthy lifestyles for adults with intellectual disabilities* 2009:298–306. Available from: (<https://doi.org/10.1111/j.1468-3148.2008.00462.x>).
- [19] LJBeaulieu, Mapping the assets of your community: a key component for building local capacity 2002.
- [20] Morgan A, Ziglio E. Revitalising the evidence base for public health: an assets model. *Promot Educ* 2007;14(2_suppl):17–22. <https://doi.org/10.1177/10253823070140020701x>.
- [21] Moore GF, Evans RE. What theory, for whom and in which context? Reflections on the application of theory in the development and evaluation of complex population health interventions. *SSM Popul Health* 2017;3:132–5. <https://doi.org/10.1016/j.ssmph.2016.12.005>.
- [22] Vlot-van Anrooij K, Hilgenkamp TIM, Leusink GL, van der Cruysen A, Jansen H, Naaldenberg J, et al. Improving environmental capacities for health promotion in support settings for people with intellectual disabilities: inclusive design of the DIHASID tool. *Int J Environ Res Public Health* 2020;17. <https://doi.org/10.3390/ijerph17030794>.
- [23] W Van Staalduinen, F ten Voorde, *Trendanalyse verstandelijk gehandicaptenzorg* [Trendanalysis about care for people with intellectual disabilities], TNO 2011.
- [24] M Ras, D Verbeek-Oudijk, E Eggink. Lasten onder de loep, de kostengroei van de zorg voor verstandelijk gehandicapten ontrafeld [Expense growth in care for people with intellectual disabilities unraveling], Sociaal en Cultureel Planbureau, Den Haag 2013.
- [25] Dooris M. Expert voices for change: bridging the silos—towards healthy and sustainable settings for the 21st century. *Health Place* 2013;20:39–50. <https://doi.org/10.1016/j.healthplace.2012.11.009>.
- [26] Vlot-van Anrooij K, Naaldenberg J, Hilgenkamp TIM, Vaandrager L, van der Velden K, Leusink GL. Towards healthy settings for people with intellectual disabilities. *Health Promot Int* 2019. <https://doi.org/10.1093/heapro/daz054>.
- [27] K. Vlot-van Anrooij, M.C.J. Koks-Leensen, A. Van der Cruysen, H. Jansen, K. van der Velden, G.L. Leusink, N. Naaldenberg. How can care settings for people with intellectual disabilities embed health promotion? *J Appl Res Intellect Disabil*. doi: 10.1111/jar.12776.
- [28] Cartwright L, Reid M, Hammersley R, Walley RM. Barriers to increasing the physical activity of people with intellectual disabilities. *Br J Learn Disabil* 2017;45:47–55. <https://doi.org/10.1111/bld.12175>.
- [29] Doherty AJ, Jones S, Chauhan U, Gibson J. Eating well, living well and weight management: a co-produced semi-qualitative study of barriers and facilitators experienced by adults with intellectual disabilities. *J Intellect Disabil* 2020;24:158–76. <https://doi.org/10.1177/1744629518773938>.
- [30] Wahlström L, Bergström H, Marttila A. Promoting health of people with intellectual disabilities: views of professionals working in group homes. *J Intellect Disabil* 2014;18:113–28. <https://doi.org/10.1177/1744629514525133>.
- [31] Caton S, Chadwick D, Chapman M, Turnbull S, Mitchell D, Stansfield J. Healthy lifestyles for adults with intellectual disability: knowledge, barriers, and facilitators. *J Intellect Dev Disabil* 2012;37:248–59. <https://doi.org/10.3109/13668250.2012.703645>.
- [32] Sundblom E, Bergström H, Elinder LS. Understanding the implementation process of a multi-component health promotion intervention for adults with intellectual disabilities in Sweden. *J Appl Res Intellect Disabil* 2015;28:296–306. <https://doi.org/10.1111/jar.12139>.
- [33] Bergström H, Elinder LS, Wihlman U. Barriers and facilitators in health education for adults with intellectual disabilities—a qualitative study. *Health Educ Res* 2014;29:259–71. <https://doi.org/10.1177/1744629514525133>.
- [34] Morgan A, Ziglio E, Davies M. *Health assets in a global context: theory, methods, action*. Springer Science & Business Media; 2010.
- [35] Lynch J, Due P, Muntaner C, Smith GD. Social capital—is it a good investment strategy for public health? *J Epidemiol Community Health* 2000;54:404–8. <https://doi.org/10.1136/jech.54.6.404>.
- [36] Friedli L. 'What we've tried, hasn't worked': the politics of assets based public health. *Crit Public Health* 2013;23:131–45. <https://doi.org/10.1080/09581596.2012.748882>.
- [37] Poland B, Krupa G, McCall D. Settings for health promotion: an analytic framework to guide intervention design and implementation. *Health Promot Pract* 2009;10:505–16. <https://doi.org/10.1177/1524839909341025>.

- [38] Wallerstein N. Power between evaluator and community: research relationships within New Mexico's healthier communities. *Soc Sci Med* 1999;49:39–53. [https://doi.org/10.1016/S0277-9536\(99\)00073-8](https://doi.org/10.1016/S0277-9536(99)00073-8)
- [39] Whitehead D, Taket A, Smith P. Action research in health promotion. *Health Educ J* 2003;62:5–22. <https://doi.org/10.1177/001789690306200102>
- [40] Vaandrager L, Kennedy L. The application of salutogenesis in communities and neighborhoods. *The handbook of salutogenesis*. Cham.: Springer; 2017. p. 159–70.
- [41] United Nations. Convention on the rights of persons with disabilities 2015.
- [42] McKnight J, Kretzmann J. *Building communities from the inside out: a path toward finding and mobilizing a community's assets*. Chicago: ACTA Publications; 1993.
- [43] Caan W, Cassidy J, Coverdale G, Ha M, Nicholson W, Rao M. The value of using schools as community assets for health. *Public Health* 2015;129:3–16. <https://doi.org/10.1016/j.puhe.2014.10.006>