

ReSpAct: Rehabilitation, Sports and Active Lifestyle

An implementation-study on physical activity promotion in rehabilitation care

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CHAPTER 1

General introduction

General introduction

Physical (in) activity: a public health issue

Physical inactivity is a global killer. It has been ranked as the fourth risk factor for global mortality, and is accountable for $\pm 6\%$ of the deaths worldwide [1]. A lack of physical activity has been associated with an increased risk for non-communicable diseases (NCDs) [2]. NCDs are slowly progressing chronic diseases, such as cardiovascular diseases, respiratory diseases (e.g. asthma), cancers and diabetes, and are together responsible for almost 70% of the deaths worldwide [1,3]. Besides the alarming health burden of physical inactivity, there is also a considerable economic burden. To illustrate, the global costs of physical inactivity have been estimated to be almost 54 billion dollar, in the year 2013 [4].

Fortunately, physical activity is a powerful medicine. Physical activity can be defined as “any bodily movement produced by the muscles that results in increased energy expenditure” [5]. Regular physical activity can minimize the risks on NCDs and is associated with a wide range of health benefits, both on the physical, cognitive and mental domain [6-8]. To achieve potential health benefits, the World Health Organization (WHO) recommends adults (18 – 64 years old) to be physically active at moderate intensity for at least 150 minutes per week or 75 minutes at vigorous intensity or a combination of both [8]. Despite of the potential health benefits of physical activity, many people around the world are still physically inactive according to these recommendations [9].

To conclude, physical (in)activity is a serious public health issue that needs to be addressed by global, national and local (governmental and healthcare) agencies [9-13].

People with physical disabilities and/or chronic diseases

For several reasons, there is a need to pay specific attention to people with disabilities or chronic diseases, when managing the physical (in)activity issue. Firstly, global estimations showed that more than one billion people live with some type of disability, which equals to more than 15% of the global population [14]. In the Netherlands, about 12% of the adult population (1.6 million persons) suffer from a moderate or severe physical disability [15]. This percentage increases to almost 40% when including people suffering from a mild physical disability [15]. Due to the aging population, it is expected that the prevalence of disability will further increase over time [16], illustrating that people with disabilities and/or chronic diseases may include a substantial group of the whole population.

Secondly, people with disabilities are characterized as a heterogeneous population. The term disability is a complex and multidimensional term including impairments, activity limitations, and participation restrictions [14,17]. People can suffer from a physical disability as a result of a wide range of diseases or disorders, such as stroke, spinal cord injury, and rheumatic disorders. Furthermore, there is a large variation in the form and severity of each disability. As a result, the extent to which people experience limitations in performing daily activities and engaging in physical activities varies from person to person. This diversity in patients' characteristics and impairments makes it challenging to successfully target this group, when managing the physical (in)activity issue.

Lastly, a physically inactive lifestyle is more often reported among people with disabilities compared to people without disabilities [18-20]. To illustrate, people with disabilities are less likely to meet physical activity guidelines [15,21-23]. In addition, sport participation among people with disabilities tends to be lower [15,21,22]. These

findings are worrisome, because it is believed that the aforementioned negative health risks of physical inactivity can be higher among people with disabilities compared to the people without disabilities. Simultaneously, potential health benefits of physical activity may be even more prominent for people with disabilities [20,24].

In sum, the importance to promote physical activity and sports among people with disabilities and/or chronic diseases is high [22,25,26].

Physical activity policies: are they targeting people with disabilities?

To date, physical activity has been acknowledged by many countries as an important public health topic [9,27-29]. To prevent NCDs on a global level, the WHO recommends national and local governments to embed physical activity promotion in their policies [30,31]. A recent publication showed that 91% of the countries (n=166), which participated in the WHO's Country Capacity Survey, had a physical activity policy [9,32]. Some countries have a separate policy focusing on physical activity promotion, while other countries integrate physical activity promotion within other existing health or sport policies [27,28,33].

Physical activity policies of national governments are often aimed at increasing physical activity levels on population-level, rather than focusing on specific sub-populations, such as people with disabilities. Since people with disabilities are often faced with different barriers to become and stay physically active [34,35], it is questionable whether these generally broad-formulated physical activity policies are successful in targeting people with disabilities.

The story is slightly different when focusing on national policies on disability sports instead of physical activity. In the last decades, the Paralympic games have increased towards one of the largest sport events worldwide. At the same time, there

has been growing attention and recognition for disability sports [36], and several, mostly western countries established specific disability sport policies [37]. Moreover, on global level, the Convention on the Rights of Persons with Disabilities (CRPD) was established and is currently ratified by more than 170 countries [38]. The CRPD states that people with disabilities have the right to participate in sports and recreation activities indicating that facilities for sports and physical activities should be accessible to all.

Despite the growing attention for disability sports, research on national approaches to promote physical activity among disabled populations is lagging behind. Such research may help to develop effective national physical activity policies that successfully targeting disabled populations in order to improve physical activity levels in the whole population. Therefore, there is a need to develop and share 'good examples' of governmental approaches that not only promote disability sports, but also include the promotion of daily physical activities among disabled populations.

The Dutch governmental approach

A short historical overview is needed to understand the current Dutch governmental approach on sports and physical activity promotion among disabled populations. In the past decades, western countries have changed their policies and perceptions on disability from an individual-focused medical viewpoint (i.e. "medical-institutional model") towards a social participation viewpoint (i.e. "social model") [14,39]. Within a social model, the focus lies on enabling people with disabilities to participate in the society. Currently, the Dutch government aims at full integration of disabled individuals into all levels of society, including disability sports (i.e. "*inclusive society and equal treatment*") [40,41].

To realize an inclusive sports society, the Dutch government has raised attention on disability sports. From the year 2000, the Ministry of Health, Welfare and Sports (in Dutch: 'VWS') expressed its commitment to increase sports participation among disabled populations and to improve the disability sports infrastructure (e.g. accessibility of sports facilities). Between the years 2000 – 2008, the government provided funding to integrate disability sports federations and organizations into mainstream sports federations. Several institutional changes were established. For example, the Nederlands Olympisch Comité * Nederlandse Sport Federatie (NOC*NSF) is “*the main organization for organized sports in the Netherlands*”, which acts both as National Olympic Committee and National Paralympic Committee [42]. Moreover, national surveys with a 5-year interval (2008; 2013) were set up to monitor changes in sport participation and physical activity levels among disabled populations [15,43].

To further promote physical activity among Dutch disabled citizens and to strengthen the sports infrastructure, the Ministry of Health, Welfare and Sports provided funding to implement three national programs. These programs were all ‘setting-focused’ (in Dutch: ‘vindplaats’) indicating that they are implemented at places where groups of people with disabilities can be reached easily, such as specialized schools or rehabilitation centers [44,45].

The first program was called ‘An alternative way!’ (in Dutch ‘Zo kan het ook!’; 2009-2012) [46]. This program aimed to promote sports and physical activities among people with intellectual disabilities by integrating sports and physical activity promotion into daily routines of healthcare institutions for people with intellectual disabilities. In addition, the program contributed to more accessible sports facilities for this population.

The second program was called 'Special Heroes' (2009 – 2012) [47]. This program aimed to promote sports and physical activities among children and youth with disabilities by integrating sports and physical activities in educational settings (e.g. specialized primary and secondary schools).

The third program was called 'Rehabilitation, Sports and Exercise' (RSE) (in Dutch: 'Revalidatie, Sport en Bewegen'; 2012 – 2015). This program aimed to promote sports and physical activities among people with physical disabilities and/or chronic diseases during and after rehabilitation. This thesis describes the nationwide implementation of the RSE program.

The 'Rehabilitation, Sport and Exercise' program

For several reasons, the RSE program is a promising national approach to increase physical activity levels among people with disabilities. The first reason is the setting and timing of physical activity promotion, namely during and after rehabilitation. As part of a rehabilitation treatment, patients are often engaged in some kind of sports or physical activities (e.g. fitness and swimming). Simultaneously, patients have the opportunity to experience, in supervised circumstances, to be physically active with their disability, thus learning to deal with potential barriers and limitations. Unfortunately, many patients perceive difficulties to maintain an active lifestyle after rehabilitation [26]. Therefore, rehabilitation seems to be an exemplary setting and timing to promote a behavior change and encourage patients to become and stay physically active at home [26,48]. The necessity to promote sports and daily physical activities not only during, but also in the period after rehabilitation was already demonstrated by van der Ploeg [49]. The authors conducted a randomized controlled trial and showed that physical activity counselling after rehabilitation was an effective

approach to achieve improved physical activity levels, both on short and long term [50,51]. These encouraging findings of van der Ploeg *et al.* (2007) became the starting point for developing an evidence-informed program (i.e. RSE) that could be scaled up to more settings across the Netherlands.

The RSE program is built upon the Physical Activity for people with a Disability (PAD) model [52] and the ‘stage of change’ part of the Transtheoretical model [53], illustrating its strong theoretical foundation. The PAD model focuses specifically on people with disabilities, and outlines the relationship between patients’ physical activity behavior, relevant determinants of physical activity (environmental and personal), and patients’ daily functioning [52]. The Transtheoretical model (i.e. ‘stage of change’ model) describes different steps that patients have to follow towards a behavioral change [53]. Although the effectiveness of the use of the ‘stage of change’ concept is still debatable, it is widely applied and experienced to be useful in general health promotion literature (e.g. smoking cessation, physical activity) (cf. [54-58]). Importantly, the ‘stage of change’ concept seems to be a practical and useful tool for counsellors to provide tailored counselling [49]. The strong theoretical and evidence-informed foundation of the RSE program is, therefore, another reason that makes the RSE program a promising national approach to increase physical activity levels among disabled populations.

Moreover, the RSE program uses a ‘disability-overarching’ approach, in which guidance is tailored on the individual patient [49]. Such an approach has the potential to be successful in targeting the heterogeneous group of people with disabilities.

Lastly, the RSE program includes the establishments of “sports counselling centers”¹ (in Dutch: “Sportloket”) [59]. A “sports counselling center” is a room or department in

¹ In this thesis the ‘Sports counseling centers’ are also called ‘Physical activity counseling centers’. Both terms are interchangeable.

the organization from which preventive consultations on active lifestyle are offered to patients. During these consultations, counsellors use a behavioral change approach to promote sustainable physical activity behavior. Counsellors help patients to make the step from physical activities in a familiar and supervised setting (i.e. rehabilitation) to physical activities in a new and self-initiated setting (i.e. community) [49]. The “sport counselling centers” act, therefore, as a bridge between physical activities in rehabilitation care settings and physical activities in community settings [26,48,60].

In sum, the RSE program is a promising national approach to increase physical activity levels among people with disabilities. Therefore, the Dutch national government (i.e. Ministry of Health, Welfare and Sports) provided financial resources for scaling up this evidence-informed physical activity promotion program (i.e. RSE) to local rehabilitation settings.

The implementation challenge

The process of scaling up a national program to local settings is challenging [61-63]. Effective health promotion programs are rarely used by health professionals spontaneously [64,65]. Many effective programs are not continued after a funded research period indicating that research fails to have impact on policy or practice. Moreover, this results in an enormous research waste [66,67], especially in the area of health promotion research [68]. The existence of this ‘research-practice’ gap (i.e. ‘implementation gap’) is widely acknowledged (cf. [62-64,69-71]) and not unique for health promotion programs: it is described to occur with different kinds of innovations (e.g. guidelines, technologies) and in different settings (e.g. healthcare, education, community) (cf. [61,72-75]).

Besides the ‘research-practice’ gap, there is also a ‘policy-practice’ gap. Policy makers tend to be good in developing policies, but fail to implement them. Recently, this ‘policy-practice’ gap was accentuated in national physical activity policies [9]. Although many countries (n=161) have a physical activity policy, only 114 countries (71%) have also a plan to implement the policy. This is worrisome, because a policy without a plan to implement it, does not make sense at all. On top of that, physical activity research on policy-related topics is lagging behind [76]. Therefore, we need more examples and better understanding of how national policy programs on physical activity promotion can be successfully implemented to local complex healthcare settings, such as rehabilitation care.

Another commonly mentioned challenge is implementing evidence-informed programs in a way that was intended by the program developers or designers [77]. This is an importance issue, because evidence-informed health promotion programs (e.g. RSE program) are only successful in changing patients’ behavior when they are “*well-implemented*” [77,78]. Generally speaking, better implementation results in better patient outcomes. However, in real-world settings, it is rarely possible to deliver an evidence-informed program, such as the RSE program, in exactly the same way as how it was proposed by the program developers due to different contexts and different patients [79]. In addition to that, adaptations seem necessary for long-term sustainability of a program in a local healthcare setting [80]. In literature, this phenomenon is also known as the ‘fidelity-adaptability’ balance [81-83]. It remains, however, unclear how to find the optimal balance between ‘fidelity’ and ‘adaptability’ in order to achieve the desirable patient outcomes, when implementing a physical activity promotion program in a multidisciplinary setting, as rehabilitation.

In the case of the RSE program, the abovementioned implementation challenges emphasize the importance to monitor the process on both organization and patient level. Fortunately, the importance to monitor and evaluate national programs is also acknowledged by the Dutch Ministry. They provided, therefore, not only funding for the implementation of the RSE program, but also to monitor and evaluate the program on organization and patient level.

Terminology and the guiding framework

Since terminology in implementation science literature varies substantially, it is important to provide definitions of key terms used in this thesis [84]. The following definitions are adapted from the glossary of Rabin *et al.* (2008) [85]:

- *Dissemination* is “an active approach of spreading evidence-based² interventions to the target audience via determined channels using planned strategies”.
- *Adoption* is “the decision of an organization or a community to commit to and initiate an evidence-based intervention”.
- *Implementation* is “the process of putting to use or integrating evidence-based or evidence-informed interventions within a setting”.
- *Sustainability/continuation*³ “describes to what extent an evidence-based or evidence-informed intervention can deliver its intended benefits over an extended period of time after external support from the donor agency is terminated”.

The following definition is adapted from Milat *et al.* [86] and based on [87]:

- *Scaling up*: “is the process by which health interventions, shown to be efficacious on a small scale and or under controlled conditions, are expanded under real world conditions into broader policy and practice”.

² This includes evidence-informed interventions.

³ Continuation and sustainability are exchangeable.

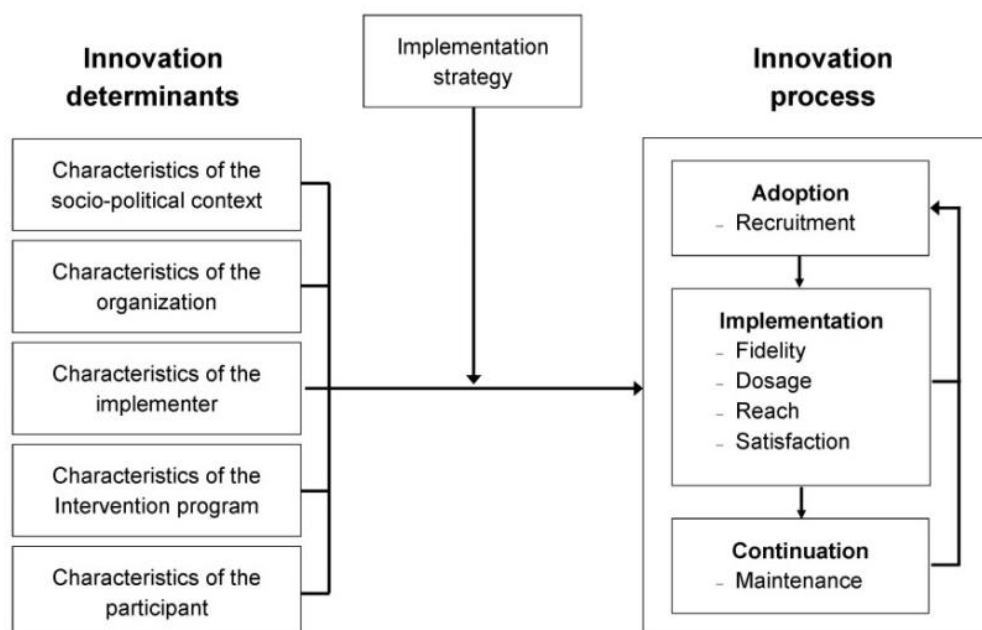


Figure 1.1

The theoretical framework [88] used to guide the monitoring and evaluation of the implementation of the “Rehabilitation, Sports and Exercise” program.

To date, many frameworks exist to guide evaluations of implementation processes [89,90]. This thesis uses the framework described by Wierenga *et al.* [88] as a guiding tool to systematically monitor and evaluate the nationwide implementation of the RSE program (see figure 1.1). This framework is built upon different frameworks, models, and theories that are widely known and commonly used in implementation studies (e.g. RE-AIM, Diffusion theory) [72,91-94].

The right-side of the framework depicts the three main phases of an innovation process: *adoption*, *implementation* and *continuation* (see above-mentioned definitions). The process outcomes (e.g. fidelity, dosage, reach, satisfaction) [91,94,95] are used to describe and evaluate the innovation process on different levels (e.g. organization, professional, participant). A further operationalization of the

process outcomes used in this thesis (e.g. fidelity, reach, satisfaction) is described in chapters 2 - 6.

The left-side of the framework depicts the *innovation determinants*, which are factors that facilitate or hamper the innovation process. The identification of the potential facilitating and hampering factors provides insights into the *context* of the innovation process. The determinants are grouped into characteristics of socio-political context, organization, innovation (i.e. program), professional (i.e. user) and participant. This grouping system is built upon the work of Fleuren *et al.* [72] and commonly used in the (inter)national literature on implementation determinants.

The middle of the framework depicts the *implementation strategy*. The implementation strategy includes one or more activities aiming to support the adoption, implementation and/or continuation of a program [96,97], such as financial incentives, educational meetings, and audits. Implementation strategies can consist of a single activity ('single component') or a combination of activities ('multifaceted component') [98]. Ultimately, the implementation strategy aims to minimize hampering factors and/or to strengthen facilitating factors [63,74,99].

The ReSpAct-study

The Rehabilitation, Sports and Active Lifestyle (ReSpAct) study is a multicenter longitudinal cohort study designed to evaluate the RSE program on organization and patient level. On organization level, the ReSpAct study aimed to monitor and evaluate the implementation of the RSE program in Dutch rehabilitation care. This thesis provides insight into the processes of adoption, implementation and continuation of the RSE program in eighteen rehabilitation centers and rehabilitation departments of hospitals during a three-year period.

On patient level, the ReSpAct study aimed to recruit ± 2000 adults suffering from a physical disability and/or chronic disease and participating in the RSE program [100]. Program outcomes (e.g. physical activity levels, quality of life, health care utilization) were assessed at different moments in time, up to one year after discharge from rehabilitation. This thesis also includes short term outcomes on patients' physical activity levels. The ReSpAct research group is currently working on analyzing the long term patient level outcomes. These insights will be available in the near future.

Aims of this thesis

This thesis describes the adoption, implementation and continuation of a national physical activity promotion program (i.e. RSE) in Dutch rehabilitation care. More specifically, the aim of this thesis was to monitor and evaluate the implementation of the RSE program in eighteen rehabilitation centers and hospitals over a three-year period (2013 – 2015). This thesis provides, therefore, insight on how sports and physical activity promotion can be a structural and integrated component of a rehabilitation treatment, including potentially facilitating and hampering factors to the implementation and continuation. Moreover, the study provides insight into the process of scaling up national physical activity promotion programs (e.g. governmental programs) to local multidisciplinary healthcare settings (e.g. rehabilitation care). Lastly, this thesis provides examples of different governmental approaches to promote sports and physical activity among adults with disabilities.

Outline of this thesis

Chapters 2 till 6 report on the dissemination of the RSE program. These findings have theoretical and practical contributions, both from a rehabilitation science

perspective as well as from an implementation science perspective. *Chapter 7* describes different governmental approaches to promote disability sports. The findings are discussed from a policy perspective.

Chapter 2 describes the rationale and design of the study on the dissemination of the RSE program in Dutch rehabilitation care.

Chapter 3 describes the status of the integration of sports and physical activity in rehabilitation care at the start of the implementation period. This chapter gives an overview of the situation in seventeen organizations that adopted the RSE program in the first year of the program period. Two process outcomes (fidelity and satisfaction) are used to describe the starting positions of the involved organizations.

Chapter 4 describes professionals' perceptions on barriers and facilitators to the implementation and continuation of a physical activity promotion program in rehabilitation care. This chapter focuses, therefore, mainly on perceived 'innovation determinants' as illustrated on the left-side of the theoretical framework (figure 1.1).

Chapter 5 describes the results of the process evaluation of the nationwide implementation of the physical activity promotion program in Dutch rehabilitation care using four process outcomes (dosage, reach, satisfaction, maintenance). In addition, this chapter presents different profiles of received counselling and shows how these profiles are associated with changes in patients' physical activity behavior on the short term.

Chapter 6 describes the heterogeneity of implementation fidelity trajectories of a health promotion program (i.e. physical activity promotion) in a multidisciplinary setting (i.e. rehabilitation care) and its association with changes in patients' physical activity behavior.

Chapter 7 puts the current Dutch governmental approach to promote physical activity in an international perspective: it describes how the Dutch and Canadian governments promote sports and physical activities among adults with disabilities. In addition, key similarities and differences between both governmental approaches are identified. In addition, this chapter outlines how the Dutch government continues with investments in physical activity promotion after the RSE program (2016).

Chapter 8 includes a summary of the main findings, a general discussion and conclusion of this thesis.

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CHAPTER 2

Design of a process evaluation of the implementation of a physical activity and sports stimulation program in Dutch rehabilitation setting: ReSpAct

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Abstract

Background

There is a growing interest to study the transfer of evidence-based information into daily practice. The evidence-based program Rehabilitation, Sports and Exercise (RSE) that aims to stimulate an active lifestyle during and after a rehabilitation period in people with a disability and/or chronic disease is prepared for nationwide dissemination. So far, however, little is known about the implementation of a new program to stimulate physical activity in people with a disability in a rehabilitation setting. Therefore, a process evaluation of the implementation of the RSE program within 18 Dutch rehabilitation centers and hospitals is performed in order to gain more insight into the implementation process itself and factors that facilitate or hamper the implementation process. This paper describes the study design of this process evaluation.

Methods

During a three-year period, the adoption, implementation and continuation of the RSE program is monitored and evaluated in 12 rehabilitation centers and 6 hospitals with a rehabilitation department in the Netherlands. The main process outcomes are: recruitment, reach, dose delivered, dose received, fidelity, satisfaction, maintenance and context. The process outcomes are evaluated at different levels (organizational and patient) and different time points. Data collection includes both quantitative (online registration system and questionnaires) and qualitative (focus groups and semi-structured interviews) methods.

Discussion

The nationwide dissemination of an evidence-based program to stimulate physical activity and sports during and after a rehabilitation period is extensively monitored

and evaluated on different levels (organization and patients) using mixed methods. The study will contribute to the science of translating evidence-based programs into daily practice of the rehabilitation care. The results of the study can be used to further optimize the content of the RSE program and to facilitate the implementation in other health facilities. Furthermore, the results of the study can help future implementation processes in the rehabilitation setting.

Trial registration

The study is registered by The Netherlands National Trial Register: NTR3961.

Keywords

Implementation, dissemination, rehabilitation, physical activity, active lifestyle, process evaluation, disability, chronic disease, health promotion

Background

Throughout the last decades, much attention has been given to the development of programs that aim to stimulate an active lifestyle in people with or without a disability and/or chronic disease [1–4]. The literature showed promising results with regard to the improvements on physical activity behavior in different population groups [1,2,5]. In most cases, such programs or interventions have been studied under controlled conditions, rather than in the real world [3,6]. It appears, however, that the step to a real-world setting is complex and often fails. Therefore, researchers have shown a growing interest in the need to study the transfer of interventions into daily practice and to understand the factors that are associated with a successful or unsuccessful transfer.

There are several steps in the transfer of an evidence-based intervention into daily practice [7–9]. Throughout this process, the organizations, including the involved professionals, have to go through three main steps. During the first main step (adoption), the professionals in the organization decide that they want to work with the new intervention. During the second step (implementation), the intervention is implemented into the organization and delivered to the persons concerned. In the last step (continuation), the intervention is integrated into the organization and maintained over time. During each step, the process is influenced by different factors, both positively and negatively [10,11].

Identifying factors that facilitate or hamper the adoption, implementation and continuation of a new program is important for a successful implementation process. It has been shown that a successful implementation of a new program is associated with better results of the program on the individual level [12]. Therefore, an

evaluation of the implementation process of a new program can help facilitate understanding and explanation of the results of the program [13].

Several researchers identified factors that lead to successful application of a new program. For example, Wierenga *et al.* [14] published a review on factors that facilitate or hamper the implementation of a health promotion program at the workplace. Furthermore, others have performed a Delphi study and identified factors that are relevant for the adoption, implementation and continuation of a physical activity intervention in the primary healthcare [11]. The authors also highlighted the importance of paying attention to the different steps of the implementation process and identified factors that are specifically relevant for these steps [11]. So far, however, little is known about the implementation of a program to stimulate physical activity in people with a disability. Moreover, even less scientific research is performed on the identification of factors that influence this process in the context of a rehabilitation treatment.

It has been proposed that the ideal timing of promoting an active lifestyle in people with a disability is immediately after the rehabilitation treatment [4,15]. The authors suggested that promoting participation in physical activities and sports immediately after the rehabilitation period would also provide the opportunity to close the existing gap between the rehabilitation setting and the sports and exercise facilities in the community [15]. The suggestion to stimulate an active lifestyle after rehabilitation was studied in a randomized controlled trial by van der Ploeg *et al.* [16]. These authors investigated the effects of two programs to promote physical activity and sports participation in people with a disability. The results of the study showed that patients who participated in the combined sports and active lifestyle stimulation program developed a better daily physical activity and sports behavior compared to

patients who participated in the sports stimulation program and the control group. The effects were visible on both the short [16] and long term [17] (9 and 52 weeks after the end of an inpatient or outpatient rehabilitation). Therefore, during the following years (2009 to 2011), this evidence-based intervention was further developed and prepared for nationwide dissemination by the Dutch Foundation 'Stichting Onbeperkt Sportief'¹. As a result, the new intervention, which is called 'Revalidatie, Sport en Bewegen' (in English: 'Rehabilitation, Sports and Exercise' [RSE]), is currently being implemented in rehabilitation centers and hospitals with a rehabilitation department in the Netherlands.

The study is part of the nationwide ReSpAct (Rehabilitation, Sports and Active Lifestyle) study [18]. This paper presents the study design of the process evaluation of the adoption, implementation and continuation of the RSE program within 18 Dutch rehabilitation centers and hospitals. Therefore, the aim of the current study is to describe the design of the process evaluation of the implementation of the RSE program within 18 Dutch rehabilitation centers and hospitals in order to gain more insight into the implementation process itself and factors that facilitate or hamper the implementation process.

Methods

Study design

The ReSpAct study is a multicenter longitudinal cohort study, in which data are collected in a real-world setting on different levels (organization and patient). During

¹ Stichting Onbeperkt Sportief is an organization that aims for a larger participation within disabled sports and physical activity and the development of suitable and accessible sports facilities.

a three-year period, the implementation of the RSE program is monitored and evaluated in 12 rehabilitation centers and 6 hospitals with a rehabilitation department in the Netherlands. For a successful implementation process, it is not only important that the program is effective at the level of the patient, but also that the implementation strategy fits with the context of the organization [19,20]. Therefore, the current process evaluation focuses on components related to the content of the RSE program and on the implementation strategy throughout the whole implementation period. Data collection includes both quantitative (online registration system and questionnaires) and qualitative (focus groups and semi-structured interviews) methods in a repeated measures set-up. The use of a combination of quantitative and qualitative data creates a rich dataset and a complete overview of the process outcomes, which makes it possible to gain better understanding in the implementation process and the related determinants.

Organizations and study population

The RSE program is being implemented in 12 rehabilitation centers and 6 hospitals with a rehabilitation department in the Netherlands from October 2012 to December 2015. All 18 organizations are receiving financial and advisory assistance to support the implementation process. Furthermore, all participating organizations are included in the process evaluation. The program developer ('Stichting Onbeperkt Sportief') was responsible for the recruitment of the centers and hospitals. If a rehabilitation center or hospital was interested in the implementation of the RSE program, the program coordinator of the RSE program visited the organization and explained the implementation procedures. Furthermore, the current situation and the ambitions with respect to the integration of exercise and sports into the rehabilitation treatment

were inventoried. An important goal was to include centers and hospitals located across the different regions of the Netherlands in order to control for possible regional variations. If the organization met the criteria to participate, they were invited to sign a declaration to participate in the program in order to formalize the adoption of the program. The inclusion criteria for organizations were as follows:

- 1) Sufficient support for the RSE program from the professionals of the organization;
- 2) Sufficient ambition to integrate exercise and sports into the rehabilitation treatment;
- 3) Sufficient intention to continue the RSE program after the project period.

After signing this declaration, the program coordinator discussed the procedures of the program and requirements for participation in the ReSpAct study in more detail with the professionals in the concerning organization. During this stage, the centers and hospitals were instructed to make an organization-specific project plan for the implementation and continuation of the RSE program. The participation of the organization in the RSE program was formalized by signing an agreement to participate by the head of the organization. By signing this document, the organization made, theoretically, the step from the adoption to the implementation of the RSE program. This document included the following elements:

- 1) willingness to implement the RSE program according to the protocol during a period of three years (2012 – 2015);
- 2) willingness to participate in the ReSpAct study until December 2015;
- 3) willingness to maintain the RSE program after December 2015.

Rehabilitation centers that participated as intervention centers in the previous study of van der Ploeg *et al.* [17] were excluded from participation. The main reason for

this exclusion criterion was to give other (and sometimes smaller) rehabilitation centers and hospitals in the Netherlands the opportunity to implement the RSE program by being given financial and advisory support.

To collect data on the level of the organization, all managers, project leaders, physicians and counselors who are involved in the implementation of the RSE program in their center or hospital are asked to participate in the process evaluation. To collect extensive data on the individual level, patients who participate in the RSE program are also asked to enroll into the ReSpAct study. It is aimed to recruit 2,000 adult patients in total from all 18 organizations together. Counselors in the involved centers and hospitals are responsible for the recruitment of patients for the ReSpAct study. The inclusion criteria for patients are: a physical disability and/or chronic disease, a minimum age of 18 years, and receiving treatment at one of the participating rehabilitation centers or hospitals. This treatment can consist of an inpatient or outpatient rehabilitation or a treatment based on medicine consultation. Inability to fill out the questionnaires that are part of the ReSpAct study was the only exclusion criterion.

The program ‘rehabilitation, sports, and exercise’

The RSE program was developed by the Dutch organization ‘Stichting Onbeperkt Sportief’ and is a tailored counseling program based on the results of the evidence-based combined physical activity and sports stimulation program of the study of van der Ploeg *et al.* [17]. The program aims to stimulate a physically active lifestyle in people with a physical disability and/or a chronic disease during and after their rehabilitation period. In order to establish a behavioral change, all consultations that are part of the RSE program are based on motivational interviewing (MI) [21]. The

'Physical Activity for people with a Disability model' (PAD model) [22] was used as a theoretical framework providing the basis for the understanding of the outcomes of the program at the level of the patient. A detailed description of the evaluation of the RSE program at the patient level is described elsewhere [unpublished study protocol by Alingh *et al.*²].

The RSE program consists of the following main components:

1) Intake session on exercise and sports

An intake session is used to identify wishes and interests with regard to exercise and sports participation of the patient and is a standard component of the rehabilitation treatment. In this way, individual goals with respect to the exercise and sports activities during rehabilitation can be formulated within the individual treatment plan. The intake session can take place with a physician or another therapist who is involved in the rehabilitation treatment program.

2) Exercise and sports are standard components of the rehabilitation treatment

The centers and hospitals integrate exercise and sports activities as a standard component of an individual rehabilitation treatment program. The organization of exercise and sports clinics for people with a physical disability and/or chronic disease can be part of this component. In this way, patients can be introduced into various exercise and sports activities as part of their rehabilitation period.

3) Referral to Sports Counseling Center

Part of the RSE program is setting up a Sports Counseling Center (SCC) within the rehabilitation center or hospital. The SCC is a specific department in the organization where the consultations of RSE program take place. Three

² This study protocol is now published as Alingh RA, Hoekstra F, van der Schans CP, *et al* Protocol of a longitudinal cohort study on physical activity behaviour in physically disabled patients participating in a rehabilitation counselling programme: ReSpAct *BMJ Open* 2015;5:e007591

to six weeks before the end of the rehabilitation, patients are referred to the SCC of the rehabilitation center or hospital. The physical activity and sports counselors working at the SCC are health professionals specialized in (adapted) physical activity and/or physiotherapy and trained in MI. The counselor gives patients support and advice in finding and engaging in physical activities, exercise and/or sports activities in the home setting. Within each rehabilitation center and hospital, the procedure of referring patients to the SCC should be clear and well organized.

4) Face-to-face consultation

After the referral to the SCC, patients receive an individual face-to-face consultation with a counselor to support and stimulate an active lifestyle at home. The counselor gives tailored advice with regard to the participation in daily physical activities, exercise and/or sports activities in the home setting. A referral to an exercise or sports activity in the region can also be part of this advice. The sessions are based on MI [21].

5) Four telephone-based counseling sessions

After the end of rehabilitation treatment, patients receive four counseling sessions by phone with the counselor of the SCC. During these counseling sessions, patients are further supported and stimulated in realizing and maintaining a physically active lifestyle at home.

6) Collaboration between SCC and external exercise and sports facilities (network)

In order to provide tailored advice for exercise and sports participation, counselors need to know which exercise and sports activities in the region are accessible for people with a physical disability and/or chronic disease.

Building up a network between the rehabilitation center/hospital and external exercise/sports facilities is therefore an important component of the RSE program. As a result, the SCC will establish a link between the rehabilitation health care and the regional network of exercise/sport activities in the Netherlands.

Furthermore, if the exercise and sports facilities in the region are not sufficient for people with a disability and/or chronic disease, the rehabilitation center or hospital itself is suggested to organize exercise and sports activities for this population. These activities can be seen as a supplement to the exercise and sports facilities in the community.

Implementation strategy for the RSE program

The implementation strategy that is used for the dissemination of the RSE program consists of different components to support the implementation and continuation of the RSE program in the participating organizations. This practical implementation strategy includes components that can contribute to a successful implementation process [10], such as collaboration and training.

The main component of the implementation strategy consists of regular visits of the two program coordinators of 'Stichting Onbeperkt Sportief' to the participating centers and hospitals in order to coordinate and support the adoption, implementation and continuation. During these visits, the program coordinators intend to meet all members of the project group. Therefore, the organizations are advised to form a project group directly after they decided to adopt the RSE program. Furthermore, professionals in the participating organizations write project plans, annual plans and annual reports concerning the implementation and

execution of the RSE program. The program coordinators review these plans and reports and provide feedback. In addition, throughout the whole project period, the program coordinators and the ReSpAct research team are also available to answer questions and/or give advice on the implementation and executing of the RSE program in the participating organizations. Furthermore, the websites of the RSE program [23] and ReSpAct study [24] provide general information about the RSE program and the ReSpAct study, the newsletters, participating organizations, and relevant contact information.

In order to facilitate the communication between organizations, a minimum of two national or regional meetings are organized by the program developers and the ReSpAct research team each year. During these meetings, professionals in the participating organizations have the opportunity to share knowledge and their experiences. Some group discussions during these days are also used to gain more insight into the implementation process within the different organizations and the possible determinants of implementation. In addition to the meetings and visits, an internet forum is available for professionals to share knowledge and experiences as well as to ask questions.

As part of the implementation strategy, a three-day training course for MI is offered to all counselors in the participating rehabilitation centers and hospitals. During this course, the basic principles and skills of MI are explained and trained. In addition to the standard course, an annual return-day was organized for the counselors to refresh and deepen their MI skills.

To further support the implementation process, the rehabilitation centers and hospitals received a 'Handbook' for the implementation of the RSE program [25]. This book includes detailed information and instructions about the main components

of the RSE program. Furthermore, the book gives an overview of different steps that the organizations have to take to implement the RSE program in their own organization. The steps are based on practical experiences and described as follows:

1) Analysis of the starting position of the rehabilitation center/hospital

In the first place, centers and hospitals should determine their own starting positions related to the different components of the RSE program (e.g., the extent to which exercise and sports is part of the rehabilitation treatment).

2) Develop and set goals for the organization

After determining the starting position, centers and hospitals should set goals related to the main components of the RSE program (intake session, exercise and sports during rehabilitation, referral to SCC, face-to-face consultations, counseling sessions, collaboration between SCC and external exercise and sports facilities) [25].

3) Analysis of possibilities to collaborate

Collaboration with other professionals within and between organizations (e.g., other rehabilitations centers/hospitals and external exercise and sports facilities) can facilitate the implementation process. An analysis of possible partners to collaborate is therefore recommended.

4) Develop an action plan including time planning

During the fourth step, all activities that have to be performed should be described in a detailed action plan. From this document, an annual plan should be derived.

5) Monitor and evaluation

Finally, the center/hospital should monitor and evaluate its own process. Part of this step is to write an annual report.

The theoretical framework of the process evaluation

The implementation process of the RSE program will be evaluated by using the recently published theoretical framework [14]. In this framework, different theoretical models [7,9,10,13] are combined into one theoretical framework. As a result, the evaluation will be done in a systematic way and will include process outcomes that are not only related to the dose and reach of the program, but also to the fidelity and satisfaction of the program. Moreover, special attention will be given to the context in which the implementation takes place. According to the framework, the following central aspects can be identified:

- 1) Implementation process: adoption
- 2) Implementation process: implementation
- 3) Implementation process: continuation
- 4) Implementation determinants

These four aspects need to be assessed by using eight process outcomes (recruitment, fidelity, dose delivered, dose received, reach, satisfaction, maintenance and context) that will be evaluated on different organizational levels [14,26] (see table 2.1 and figure 2.1). In the current study, data collection started after the rehabilitation centers and hospitals decided to adopt the RSE program. Therefore, the aspects related to the adoption will only be assessed retrospectively. As a consequence, the focus of the current process evaluation will be on the implementation and continuation of the RSE program and on the related

determinants. Table 2.1 presents the outcomes that are measured during the implementation process of the RSE program on both the level of the organization and the patient.

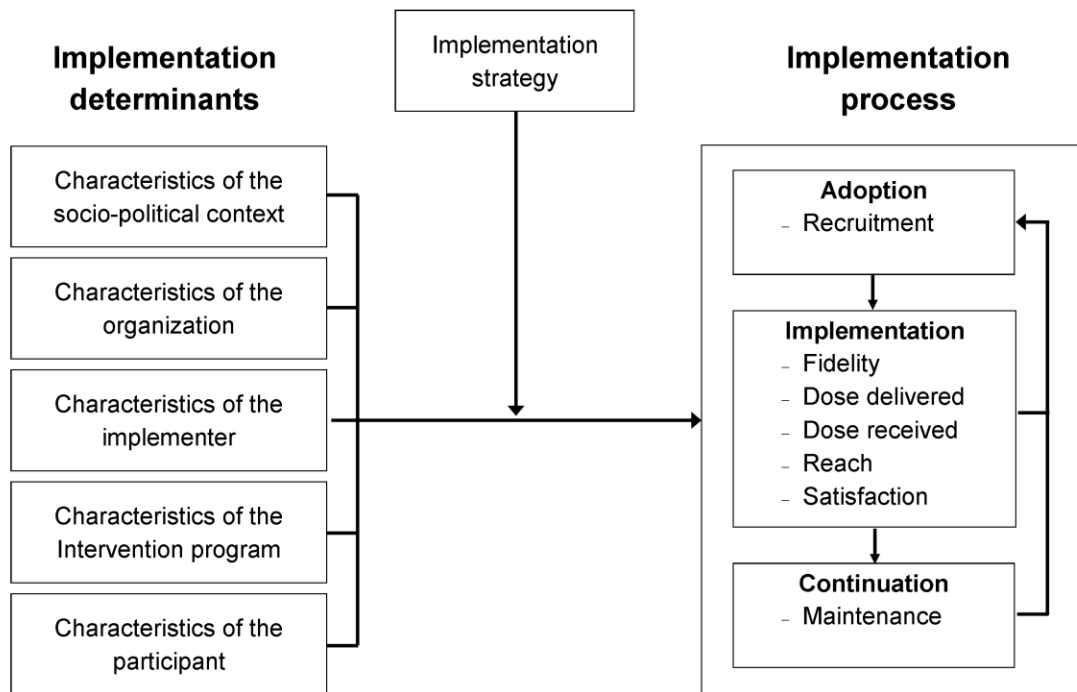


Figure 2.1

Theoretical framework adapted from Wierenga *et al.* [14].

Table 2.1

Process outcomes of the evaluation of the implementation process of the RSE program

Process outcomes	Definitions of process outcomes*	Description	Data collection
1) Adoption <i>Recruitment:</i>	'Procedures used to approach centers and hospitals to participate in the RSE program.'	Organization level: - Strategy of inviting organizations to participate in the RSE program - Reasons of organizations for (not) participating in the program	I
2) Implementation <i>Fidelity:</i>	'The extent to which the RSE program has been implemented as planned (the quality of the implementation).'	Organization level: - Conformity to the implementation strategy (main components) - Conformity to the RSE program (main components)	Q, RS, I, FG
<i>Dose delivered</i>	'The amount of the RSE program that is delivered or performed by the professionals.'	Organization level: - Amount of activities performed as part of the implementation strategy - Amount of introductory sessions delivered - Amount of sport and exercise activities as standard components of the rehabilitation treatment - Amount of face-to-face sessions delivered by the counselor - Amount of counseling sessions delivered by the counselor - Amount of collaborations with exercise and sport facilitators (network)	Q, RS
<i>Dose received</i>	'The amount of the RSE program that is received by the patients'	Patient level: - Number/ percentage of patients who get acquainted with sport and exercise activities during rehabilitation treatment - Number/ percentage of patients who are referred to the SCC - Number/ percentage of patients who received a face-to-face consultation - Number/ percentage of patients who received counseling - Number/ percentage of patients who are referred to a sport and exercise activity in the region	Q, RS
<i>Reach</i>	'The extent to which professionals and persons with a physical disability and/or chronic disease are reached by the implementation of the RSE program.'	Organization level: - Number of exercise and sport facilities that collaborate with participating organizations (network) - Number / percentage of professionals participating in activities that are part of the implementation strategy - Number/ percentage of professionals participating in the RSE program Patient level: - Number/ percentage of patients participating in the RSE program	Q, RS, FG
<i>Satisfaction</i>	'Opinion about the RSE program and the implementation strategy.'	Organization level: - Opinion about the implementation strategy by professionals - Opinion about the content of the RSE program by professionals - Satisfaction about the implementation RSE program within the organization	Q, RS, FG

		Patient level:	
		- Satisfaction/ opinion about the RSE program by patients	
		- Satisfaction about the sport and exercise facilities in the region by patients	
3) Continuation <i>Maintenance</i>	'The extent to which the RSE program is integrated into the routines and into the organization.'	Organization level:	Q, I, FG
		- The integration of the RSE program into the standard rehabilitation treatment	
		- The integration of the RSE program into the policy of the organization	
4) Implementation determinants <i>Context</i>	'Aspects of the environment that influence the implementation of the RSE program or the RSE program outcomes.'	Organization and patient level:	Q, RS, I, FG
		- Characteristics of the social-political context	
		- Characteristics of the rehabilitation center/ hospital	
		- Characteristics of the professionals of the center/ hospitals	
		- Characteristics of the RSE program	
		- Characteristics of the patients	

*Definitions are based on the literature of Steckler and Linnan [13] and Saunders *et al.* [33]; Q = questionnaires, RS = registration system, I = interviews, FG = focus groups.

As can be seen in figure 2.1, the potential factors that facilitate or hamper the implementation process ('implementation determinants') can be classified into the following groups:

- 1) Characteristics of the social-political context
- 2) Characteristics of the rehabilitation center/ hospital
- 3) Characteristics of the professionals of the centers/ hospital
- 4) Characteristics of the RSE program
- 5) Characteristics of the patients

The other block of the framework is the implementation strategy, which is also an essential element to successfully implement a new program into daily practice [19]. The components related to the implementation strategy of the RSE program as described in the previous section are also incorporated in the process outcomes (see table 2.1 and figure 2.1).

Data collection

The evaluation of the implementation process of the RSE program will be performed over a period of three years. Quantitative and qualitative data are collected on the level of the organization and the patient level. A complete overview of the different methods that are being used to collect the data that at the different levels is shown in figure 2.2.

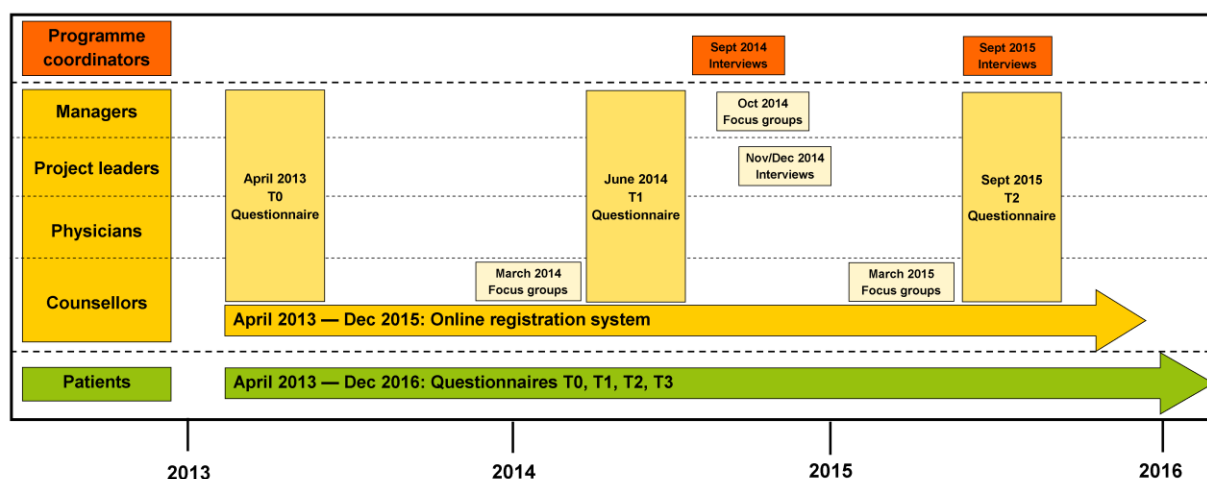


Figure 2.2

Overview of the different methods used to collect data for the process evaluation.

Data are collected at different levels and at different time points.

Level of the organization: questionnaires

Managers, project leaders, physicians and counselors are asked to fill out a questionnaire at baseline (April 2013), one year later (June 2014), and at the end of the implementation period (September 2015). The expected numbers of professionals participating in the process evaluation are: 18 managers, 18 project leaders, 18 physicians and approximately 36 counselors. The theory-based questionnaires were constructed based on the literature of Fleuren *et al.* [10] and Grol *et al.* [8]. The questionnaires include questions about the different process outcomes (*i.e.*, fidelity, dose, reach, satisfaction, and context) and possible factors that hamper or facilitate the implementation process (Table 2.1). The questionnaires not only contain questions with multiple choice answers (4- or 5-point Likert scale) but also open-ended questions.

In order to provide questions related to the tasks of the different professionals, different questionnaires were constructed and adapted to the different professions. This procedure resulted in four different questionnaires for four different groups of

professionals: managers, project leaders, physicians and counselors. When a professional fulfils more than one role (*i.e.*, manager and project leader), both questionnaires are combined. Filling out the questionnaire takes approximately 30 to 45 minutes, depending on the role(s) of the professional.

Level of the organization: online registration system

An online registration system was developed to collect real-time data about the dose, reach and fidelity of the RSE program. The counselors are asked to complete an online form after each face-to-face consultation delivered at the SCC. This form includes questions about basic characteristics of the concerning patient (year of birth, gender, disease/disability, type of rehabilitation treatment) and some questions about the content of the face-to-face conversations. The aim of this registration form is to collect real-time data about the total number of patients who participated in the RSE program including some basic characteristics of the patients and delivered consultations. Completing this form lasted approximately two minutes.

In addition to this, counselors complete a more extensive form about dose delivered to patients who gave written informed consent to participate in the ReSpAct study. This form includes questions about the date, duration, mode and content of all consultations between counselor and patient (face-to-face and counseling sessions). Based on this information, more insight can be gained about the extent to which the RSE program has been delivered as planned. Completing this extensive form lasted approximately 15 minutes.

Level of the organization: focus group discussions and semi-structured interviews

All managers who are involved in the implementation of the RSE program are invited to participate in a focus group discussion about financial aspects related to the implementation and execution of the RSE program. The available financial resources are an important determinant for a successful implementation and continuation of the RSE program. Possibilities to receive financial support from health insurances, local authorities and/or other organizations are discussed with the involved managers. Qualitative techniques will be used to detect possible factors that hamper or facilitate the implementation and continuation of the RSE program.

Similarly, a focus group discussion is organized for the involved counselors in the participating centers and hospitals. During this session the content of the RSE program is discussed with the counselors. Special attention is given to their opinion about the RSE program and possibilities to improve the content of the RSE program. Furthermore, all project leaders (n = 18) are asked for a semi-structured interview to collect data about the fidelity and satisfaction of the implementation strategy and content of the RSE program. Also, the experienced factors that hamper and facilitate the implementation process are discussed during the interviews. The qualitative data gathered from the interviews will be used to detect, explain and interpret factors leading to success and failure.

Finally, the program coordinators (n = 2) are asked for a semi-structured interview during and at the end of the implementation period to gain more insight into the delivered support to the individual centers and hospitals. Also, their experiences and satisfaction about the adoption, implementation and continuation of the RSE program are discussed. Qualitative data obtained from the interviews with the

program coordinators will be used to verify and/or explain the findings of the process evaluation.

Patient level: questionnaires

Patients participating in the ReSpAct study (n = 2,000) fill out a questionnaire at baseline, 14 weeks after the end of the rehabilitation period and at a 33 and 52 weeks follow-up. The questionnaires include questions about quality of life, physical activity behavior and its related determinants (*i.e.*, attitude, self-efficacy, social support, barriers and facilitators). The health-related quality of life will be assessed by using the adapted version of the RAND-36 [27–29]. The SQUASH questionnaire, adjusted for patients with a physical disability, is used to measure the physical activity behavior of the patients [30]. Furthermore, patients are asked about their opinion and experiences of the received support from the counselor of the SCC. Detailed descriptions of the content of the questionnaires with respect to the physical activity outcomes are described elsewhere [unpublished study protocol by Alingh *et al.*]. Dose–response relationships are used to gain more insight into the effectiveness of the RSE program and its underlying mechanisms.

Data analyses

The evaluation of the implementation process will be performed by using the eight process outcomes as described in Table 2.1. The process outcomes will include both quantitative and qualitative data. Descriptive analyses (frequencies, means and percentages) of the quantitative data collected from the online registrations system and questionnaires will be performed with SPSS version 20.0 (SPSS Inc. Chicago, Illinois, USA). The qualitative data collected during the interviews and focus groups

will be audiotaped and transcribed verbatim. After reading the transcripts several times to familiarize with the text, codes will be identified. Subsequently, these codes will be categorized into different themes [31]. Qualitative data analyses will be performed by using the software program 'Atlas.ti.'

Ethical considerations

The Medical Ethical Committee of the University Medical Center Groningen has exempted the approval of the study protocol. Therefore, the ethics committee of the Center of Human Movement Sciences of the University Medical Center Groningen approved the study protocol at the levels of both the organization and the patients.

Trial status

The implementation process in the 18 participating rehabilitation centers and hospitals is being monitored until December 2015. Data collection on the level of the organization started in April 2013 and is ongoing until December 2015. The recruitment of the patients to participate in the ReSpAct study is ongoing and will stop at the end of 2015, indicating that data collection on patient level is ongoing until the end of 2016.

Discussion

In the last decades, much research has been performed on translating evidence-based programs into daily practice [3,32]. Performing a process evaluation can be helpful to gain more insight into factors that hamper or facilitate this translation to daily practice [13,33]. This paper described the design of the process evaluation of a

unique nationwide dissemination of an evidence-based program to stimulate physical activity and sports during and after a rehabilitation period (the RSE program). This study design is the first step of sharing our ambitions, knowledge and plans with regard to the integration and stimulation of physical activity, exercise and sports in the Dutch rehabilitation setting.

The present study will therefore contribute to the science of translating evidence-based programs into daily practice of the rehabilitation care. By using the theoretical framework of Wierenga *et al.* [14] to evaluate the implementation of the RSE program, information on the implementation process will be obtained and evaluated on different levels and during the entire implementation period. This will result in a rich dataset that will expand the knowledge on the translation of new programs into daily practice. Furthermore, the theoretical framework is also presented in an evaluation of the implementation of a lifestyle intervention at the workplace [26]. Therefore, the present study allows a better insight into the application possibilities of this framework in a health care setting.

Furthermore, the implementation process of the RSE program is unique, because 12 Dutch rehabilitation centers and 6 hospitals with a rehabilitation department are involved and are situated across the country. In 2010, the Netherlands comprised 21 rehabilitation centers and 81 hospitals that offered a rehabilitation treatment [34]. Because a relatively large number of the total Dutch rehabilitation care organizations is involved in the present project, it is expected that the dissemination and evaluation of the RSE program will have a large nationwide impact on the Dutch rehabilitation care. Furthermore, during the implementation of the RSE program, participating organizations will build up a network with external sports and exercise facilities for people with a disability and/or chronic disease. As a result, it is expected that the

dissemination of the RSE program will establish the link between the rehabilitation care and exercise/sport facilities in the community throughout the Netherlands [15].

A main strength of the current study design is that the implementation process of the RSE program is extensively monitored and evaluated on different levels (patients and organizations) and by using mixed methods. Furthermore, data is being collected over a three-year period, which makes it possible to evaluate the process outcomes longitudinally. The use of a combination of quantitative and qualitative methods will allow us to verify and combine the results by using triangulation [35,36]. The use of mixed methods at different time points will therefore contribute to a complete and better understanding of the results on both the level of the organization and the patient.

Another strength of this study is that simultaneous to the process evaluation, a study to evaluate the program outcomes is performed [18]. Although this design creates more work for the involved professionals, there are advantages of carrying out these two evaluations simultaneously. Early research has shown that a successful implementation of a new program is associated with better results of the program on the individual level [12]. When measuring and evaluating the RSE program outcomes and process outcomes simultaneously, it is possible to investigate how they relate to each other. In this way, the results of the process evaluation can help us to understand and explain the outcomes of the program on the level of the patient [13,33].

Another strong point of the implementation process itself is that the process is coordinated and supported by the program developers. The participating organizations are thus receiving financial, material and advisory support during the implementation period. Moreover, the practical implementation strategy includes

activities that have been shown to contribute to successful implementation of a new program into daily practice [10,11]. Furthermore, the implementation of the RSE is supported by the Netherlands Society of Physical and Rehabilitation Medicine. This society has established an accredited working group on exercise and sports that aims to integrate exercise and sports into the rehabilitation in order to support an active lifestyle in persons with a disability during and after the rehabilitation period, which is in line with the aims of the RSE program. Consequently, the dissemination of the RSE program in 18 Dutch rehabilitation centers and hospitals has large potential to be successful.

There are also some limitations that should be mentioned. The inclusion criteria that are formulated for the organizations included that there was sufficient support and ambition by the professionals in the organization to implement the RSE program. Although these criteria are important factors for a successful implementation process [10], it might have biased the sample of the participating organizations. It is possible that the participating rehabilitation centers and hospitals are more willing to implement the RSE program compared to the other Dutch rehabilitation centers and hospitals. This possible recruitment bias should be taken into account when analyzing the results of the process evaluation.

Another limitation of the present study is that the process evaluation is performed in the Dutch rehabilitation setting. The organization structure of the rehabilitation care in the Netherlands is relatively well organized and can differ from other countries. For example, before the start of the implementation of the RSE program, exercise and sports were already to some extent integrated into the Dutch rehabilitation care [17]. Therefore, it is important to realize that the results of the present study cannot directly be applied to rehabilitation care outside the Netherlands. Despite the fact

that direct application of the results may not be possible in all countries, the organization of the Dutch rehabilitation care can be used as an example to organizations in other countries. When analyzing and discussing the results of the study, it is valuable to pay attention to the specific context in which the data are collected and to discuss the application possibilities of the results in a different context.

Practical relevance

The present study will be relevant for daily practice. This study will identify factors that hamper or facilitate the implementation of a new program in rehabilitation centers and hospitals. It has been shown that these factors may vary in different contexts [10]. The information achieved in this study can be used in future projects in which new programs or interventions are implemented in a rehabilitation setting. Moreover, the data collected during this process evaluation can be used to further optimize the content of the RSE program. Based on the information that is collected from both the professionals and the patients, specific recommendations can be formulated to optimize the content of the RSE program. It is likely that such optimizations will improve the program outcomes at patient level.

Abbreviations

MI, Motivational Interviewing; RSE, Rehabilitation, Sports and Exercise; ReSpAct, Rehabilitation, Sports and Active Lifestyle; SCC, Sports Counseling Center

Competing interests

The author(s) declare that they have no competing interests.

Authors' contributions

All authors contributed to the design and protocol of the study. LHVW, CPS, RD, FJH and MD contributed to obtaining funding. FH drafted the manuscript. LHVW, RAA, CPS, FJH, MD and RD reviewed the manuscript and provided comments and revisions. All authors read and approved the final manuscript.

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CHAPTER 3

The current implementation status of the integration of sports and physical activity into Dutch rehabilitation care

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Abstract

Purpose

To describe the current status of the nationwide implementation process of a sports and physical activity stimulation program to gain insight into how sports and physical activity were integrated into Dutch rehabilitation care.

Methods

The current implementation status of a sports and physical activity stimulation program in 12 rehabilitation centres and 5 hospitals with a rehabilitation department was described by scoring fidelity and satisfaction. Seventy-one rehabilitation professionals filled out a questionnaire on how sports and physical activity, including stimulation activities, were implemented into rehabilitation care. Total fidelity scores (in %) were calculated for each organization. Professionals' satisfaction was rated on a scale from 1 to 10.

Results

In most organizations sports and physical activity were to some extent integrated during and after rehabilitation (fidelity scores: median=54%, IQR=23%). Physical activity stimulation was not always embedded as standard component of a rehabilitation treatment. Professionals' satisfaction rated a median value of 8.0 (IQR=0.0) indicating high satisfaction rates.

Conclusions

The fidelity outcome showed that activities to stimulate sports and physical activity during and after rehabilitation were integrated into rehabilitation care, but not always delivered as standardized component. These findings have emphasized the importance to focus on integrating these activities into routines of organizations.

Keywords

People with disabilities, chronic disease, active lifestyle, dissemination

Implications for rehabilitation:

- Components of an evidence-based program to stimulate sports and physical activity during and after rehabilitation can be used to measure the current status of the integration of sports and physical activity in rehabilitation care in a structural and effective way.
- The method described in the current study can be used to compare the content of the rehabilitation care regarding the integration of sports and physical activity among organizations both on a national and international level.
- Sports and physical activity are seen as important ingredients for successful rehabilitation care in the Netherlands.

Introduction

Despite of the well-evidenced benefits of a physically active lifestyle [1-3], people with disabilities and/or chronic diseases show lower levels of physical activity compared to the general population [4,5]. Therefore, special attention is needed to promote a physically active lifestyle in people with disabilities and/or chronic diseases. Up until now, programs to stimulate physical activity have mainly focused on the general population rather than on people with a disability [6,7]. A special approach for physical activity promotion targeting people with a disability is necessary, as the experienced barriers to participate in physical activity programs are largely unique for this population [6,8]. An early start of these promotional activities, already during the rehabilitation treatment, is essential [9,10]. Rehabilitation care frequently offers different sports or exercise activities such as fitness, walking or swimming in order to restore mobility and daily functioning [11]. A structured integration of sports and exercise activities during rehabilitation can be an appropriate way to get people with a disability acquainted with different sports and exercise activities that may contribute to the stimulation of an active lifestyle after rehabilitation.

For that reason, from the year 1997, several Dutch rehabilitation centres decided to collaborate with each other in order to integrate sports into rehabilitation care. This resulted in a national project to stimulate sports during rehabilitation that was executed in thirteen Dutch rehabilitation centres during the years 1997 – 2001 [12]. Although stimulation of sports during rehabilitation can be successful, it seems not sufficient for all patients to remain physically active after rehabilitation [13]. Van der Ploeg *et al.* (2007) showed that stimulating sports and physical activity both during

and after a clinical rehabilitation process was an effective way to maintain a physically active lifestyle at home [10,13]. In continuation of these positive findings [13], 'Stichting Onbeperkt Sportief'¹ developed the evidence-based program named 'Revalidatie, Sport en Bewegen' (in English: Rehabilitation, Sports and Exercise [RSE]) during the years 2009 - 2011. The RSE program aims to stimulate physical activity and sports in people with physical disabilities and/or chronic disease not only during but also after a rehabilitation treatment. As part of the RSE program, patients are provided with the opportunity to get acquainted with different exercise and sports activities during their rehabilitation treatment. At the end of the rehabilitation, patients can be referred to a sports or exercise activity in the community. The RSE program ends with a period of counselling after rehabilitation to stimulate a long-term active lifestyle at home. In this way, the RSE program can create a link between the rehabilitation care on one side and the sports and exercise facilities in the community on the other side [9]. Furthermore, the RSE program can be seen as an evidence-based approach to integrate sports and physical activity into rehabilitation practice in structural and effective way.

In the following years, a nationwide implementation of the RSE program was organized with financial resources provided by the Dutch Ministry of Health, Welfare and Sport. This process includes a structured and organized implementation of the RSE program in twelve Dutch rehabilitation centres and six rehabilitation departments of hospitals across the country during the period of 2012 - 2015. The implementation process and the outcomes of the RSE program will be evaluated by the ReSpAct (Rehabilitation, Sports and Active Lifestyle) research group [14,15].

¹ Stichting Onbeperkt Sportief is an organization that aims for a larger participation within disabled sports and physical activity and the development of suitable and accessible sports facilities.

Because the rehabilitation organizations participating in ReSpAct are situated relatively close together and under similar climatic and infrastructural circumstances, it is a unique opportunity to describe nationwide the integration of sports and physical activity in rehabilitation care. As described in the previous paragraph, the Netherlands has a history of projects that aimed to integrate sports and physical activity into the rehabilitation care. A report on the current status of the implementation of the RSE program in organizations participating in ReSpAct can be a suitable way to illustrate how sports and physical activity are integrated into Dutch rehabilitation care. Process outcomes, such as fidelity and satisfaction, are often used to evaluate an implementation process longitudinally [15,16]. The fidelity as an indication of the “quality of the implementation” [17,18] in combination with professionals’ satisfaction on the program can also be relevant outcomes to describe an implementation status of a sports and physical activity stimulation program cross-sectional.

The aim of this study was to describe the current status of the implementation of a sports and physical activity stimulation program in order to gain insight into how sports and physical activity were integrated into Dutch rehabilitation care.

Methods

Study design

The current study used cross-sectional data that are part of a multicentre longitudinal cohort study ReSpAct. The ReSpAct study will evaluate the implementation process of the RSE program. A detailed description of the design of the process evaluation is described elsewhere [15]. As part of the baseline measurement of this process

evaluation, professionals involved in ReSpAct were asked to fill out a questionnaire. Based on this questionnaire, the quality of the implementation of the RSE program (i.e. fidelity) together with professionals' satisfaction of the program were used to describe the current status of the implementation of a sports and physical activity stimulation program. This paper presents parts of the baseline measurement to describe the implementation status in organizations that participate in ReSpAct.

Participating organizations and professionals

Before the start of the nationwide implementation of the RSE program (April 2011), managements of 33 Dutch organizations (rehabilitation centres and hospitals) were approached to indicate if they were interested in implementing the RSE program. From this group, 9% (n=3) were not interested, 24% (n=8) were interested and 45% (n=15) of the approached organizations were highly motivated to implement the RSE program. Organizations that were not interested in the RSE program were not recruited to participate in the nationwide implementation process. Detailed description about the inclusion criteria for organizations were described elsewhere [15].

All professionals (managers, project leaders, physicians, counsellors) who were involved in the implementation of the RSE program in one of the participating organizations, were asked to participate in the baseline measurement by filling out a questionnaire.

Data collection

Data were collected by using digital and paper-based questionnaires. The questionnaire was filled out by rehabilitation professionals at the start of a nationwide

implementation process (April – May 2013). The questionnaire contained questions about the current status of the implementation of sports and physical activity into rehabilitation care. Specific questions were formulated about the extent to which the main components of the RSE program were integrated into the routines of the organization (i.e. fidelity). The RSE program contains both components related to sport and physical activity during rehabilitation and activities to stimulate a physically active lifestyle after rehabilitation. The main components of the RSE program are:

- 1) Intake session on exercise and sports
- 2) Exercise and sports during rehabilitation
- 3) Referral to Sports Counselling Centre (SCC)
- 4) Face-to-face consultation
- 5) Telephone-based counselling sessions
- 6) Collaboration between SCC and external exercise and sports facilities.

A detailed description of these components can be found elsewhere [15]. In addition, the questionnaire contained questions about satisfaction of the professionals with the RSE program. The content of the questionnaires was adapted to the role of the professionals. In this way four different questionnaires were constructed specifically designed for four different professional groups: managers, project leaders, counsellors, physicians. Questionnaires were combined in cases that professionals fulfilled more than one role (e.g. project leader and counsellor).

Outcome measures

Fidelity was determined as primary outcome measure to describe the implementation status. Since the RSE program can be seen as an evidence-based approach to integrate sports and physical activity into rehabilitation care in structural

and effective way, the main components of this program were used to measure fidelity. To measure the implementation status of the six main components, a total of 13 close-ended questions were selected from the questionnaire. The source of the selected questions (e.g. project leader or manager) differed. The topics of the selected questions including information about their source are presented in table 3.1. By assessing the fidelity, information can be gained on the extent to which the components of the RSE program were implemented according to the guidelines [15]. Hereby, the fidelity outcome can be used to measure the integration of sports and physical activity into rehabilitation in a structural way.

Because not all participating organizations offer inpatient rehabilitation treatment, the fidelity outcome was focused on the implementation of the program in outpatient rehabilitation treatment instead of inpatient rehabilitation treatment. Moreover, most patients who receive an inpatient rehabilitation treatment continue their rehabilitation with a period of outpatient rehabilitation. Activities to stimulate physical activity at home take mainly place at the end of the outpatient treatment. As a result, most patients who participate in the RSE program are outpatients.

Satisfaction was determined as secondary outcome measure to evaluate the professionals' satisfaction about the integration of sports and physical activity into rehabilitation care. Satisfaction was measured by asking professionals to rate their appreciation for the RSE program on a scale ranged from 1 to 10. Higher ratings indicated a greater satisfaction.

Data analyses

The fidelity was evaluated on organization level. If more than one professional working in the same organization answered the same questions, the answer of the

professional who was a member of a multidisciplinary rehabilitation team was presented. In cases that both professionals were members of the multidisciplinary rehabilitation team and gave different answers on the same questions, the results for that organization were presented as 'no consensus'.

All 13 questions that were selected for analysis of the fidelity outcome were dichotomized. If the topic of the question was implemented according to the guidelines of the RSE program, the answer of the question was dichotomized into 'yes'. Subsequently, the total fidelity score was calculated by adding up the number of questions that were 'yes' and dividing the summed score by the total score (=13). A total fidelity score was calculated for each organization and presented as percentages. Higher total fidelity scores indicated better integration of sports and physical activity into rehabilitation according to the guidelines of the RSE program.

Median (mdn) and interquartile ranges (IQR) of the professionals' satisfaction rates were calculated and presented. All descriptive analyses were performed with SPSS version 20.0 (SPSS Inc. Chicago, Illinois, USA).

Ethical considerations

The implementation study of ReSpAct was separately approved by the ethics committee of the Centre for Human Movement Sciences of the University Medical Centre Groningen. The participating professionals signed a (digital) informed consent. The study is registered by The Netherlands National Trial Register: NTR3961.

Results

Participating organizations and professionals

The current implementation status in twelve rehabilitation centres and five hospitals with a rehabilitation department were described. The 17 organizations were spread out over the whole country.

71 Professionals completed and returned the questionnaire (total response rate: 94.7%). Table 3.2 shows the professionals' response rates to the questionnaire. In each organization a project leader and one or more counsellors completed the questionnaire. In one organization the involved manager did not return the questionnaire. Furthermore, in three organizations there was no physician involved in the implementation process of the RSE program.

Table 3.1

Fidelity of the implementation of sports and physical activities into outpatient rehabilitation

Components for outpatient rehabilitation treatment	Yes	No	n.c.	Source
1) Intake session on exercise and sports				
- Takes place	10	6	0	PL ^c
- As standard component of rehabilitation ^a	2	8	0	PL ^d
2) Exercise and sport during rehabilitation				
- 'Sports and exercise during rehabilitation' is part of the official policy of the organization	8	8	0	M ^c
- More than one sports or exercise activity (e.g. swimming, fitness) are delivered as part of a rehabilitation treatment	17	0	0	C
- The topic 'sports and exercise' is discussed during a multidisciplinary team meeting ^b	9	4	0	Ph
3) Referral to SCC				
- Takes place	15	2	0	PL
- As standard component of rehabilitation ^a	5	11	0	PL ^c
4) Face-to-face consultation				
- Takes place	14	3	0	PL
- All counsellors use MI during almost every consultation	6	11	0	C
5) Telephone-based counselling sessions				
- Takes place by phone	9	8	0	PL
- As standard component of rehabilitation ^a	3	13	0	PL ^c
6) Collaboration between SCC and external exercise and sports facilities				
- Collaboration between SCC and external exercise and sports facilities	10	3	4	C
- All counsellors have knowledge of sports and exercise facilities in the region	10	1	6	C

Fidelity contained both components related to sports and physical activity during rehabilitation as well as activities to stimulate a physically active lifestyle after rehabilitation. Results were clustered for each organization (n=17). N.c. = no consensus, PL = project leader, M = managers, C = counsellors, Ph = physicians, SCC = Sports Counsellor Centre, MI = Motivational Interviewing.

^ayes = standard component for (almost) all outpatients, no = standard component for only some groups of outpatients or not standard component at all.

^byes = always or most of the times; no = never or sometimes.

^c One missing value, therefore n=16.

^d This question was not shown if subjects answered that an intake session did not take place, therefore n=10.

Fidelity

Table 3.1 presents the fidelity of the integration of sports and physical activity into rehabilitation care. In the majority of the organizations an intake session (n=10), referral to the SCC (n=15), a face-to-face consultation (n=14) and telephone-based counselling sessions (n=9) took place as part of an outpatient rehabilitation treatment. However, these components were often not embedded as a standard component of the rehabilitation treatment (table 3.1).

In the same way the results showed that in all organizations (n=17) more than one sports or exercise activities were delivered as part of a rehabilitation treatment, but in only nine organizations the topic 'sports and exercise during rehabilitation' was part of the official policy of the organization.

In ten organizations the counsellors working in the SCC collaborated with external sports and exercise facilities. In four organizations counsellors working in the same organization gave different answers on the same questions. Therefore, it was not clear whether there was collaboration between the SCC and external facilities. In ten organizations, all counsellors reported that they had knowledge of the sports and exercise facilities in the region.

Figure 3.1 presents the total fidelity scores for each organization (n=17). The median of the total fidelity scores was 54% with an IQR of 23%. The total fidelity scores ranged from 15% (n=1) to 85% (n=1).

Table 3.2

Professionals' response rates to the questionnaire.

Organization	Manager	Manager + project leader	Project leader	Project leader + counsellor	Counsellor	Physicians	Total
1	1 / 1	-	1 / 1	-	3 / 4	1 / 1	6 / 7
2	1 / 1	-	1 / 1	-	3 / 3	-	5 / 5
3	-	1 / 1	-	-	1 / 1	1 / 1	3 / 3
4	0 / 1	-	1 / 1	-	3 / 3	1 / 1	5 / 6
5	1 / 1	-	-	1 / 1	3 / 3	1 / 1	6 / 6
6	1 / 1	-	1 / 1	-	1 / 1	1 / 1	4 / 4
7	1 / 1	-	-	1 / 1	1 / 1	-	3 / 3
8	1 / 1	-	1 / 1	-	1 / 1	1 / 1	4 / 4
9	-	1 / 1	-	1 / 1	-	1 / 1	3 / 3
10	-	1 / 1	-	-	2 / 2	1 / 1	4 / 4
11	1 / 1	-	1 / 1	-	3 / 3	0 / 1	5 / 6
12	-	1 / 1	-	-	2 / 2	1 / 1	4 / 4
13	1 / 1	-	1 / 1	-	2 / 2	1 / 1	5 / 5
14	1 / 1	-	1 / 1	-	1 / 1	1 / 1	4 / 4
15	2 / 2	-	1 / 1	-	1 / 1	-	4 / 4
16	-	1 / 1	-	-	1 / 1	1 / 1	3 / 3
17	-	1 / 1	-	1 / 1	0 / 1	1 / 1	3 / 4
Total	11 / 12 (91.7%)	6 / 6 (100%)	9 / 9 (100%)	4 / 4 (100%)	28 / 30 (93.3%)	13 / 14 (92.8%)	71 / 75 (95.7%)

Response rates are shown for each organization. If a role of the professional (e.g. manager + project leader) was not present in the organization, a '-' was shown. 3 / 4 indicates that of four available professionals, three responded, meaning a 75% response rate.

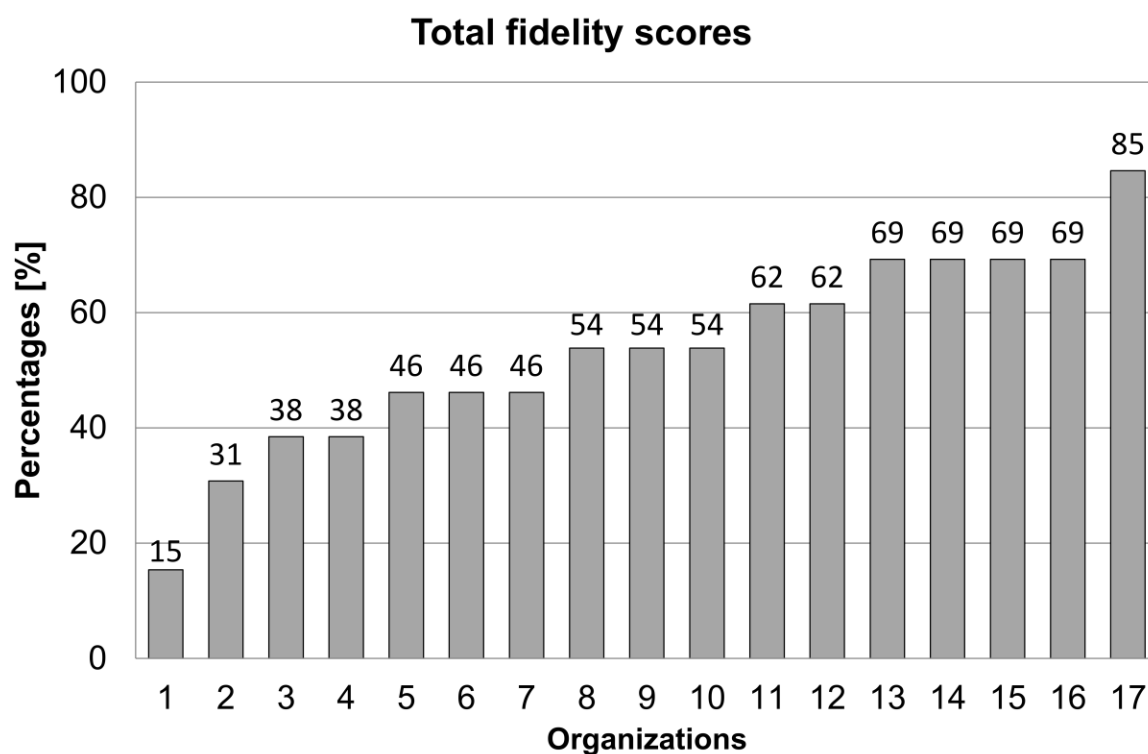


Figure 3.1

Total fidelity score for each of the 17 organisations. Higher fidelity scores indicated better integration of sports and physical activities into rehabilitation according to the guidelines of the RSE program.

Satisfaction

Professionals rated the RSE program with a median value of 8.0 (IQR = 0.0) indicating that professionals' satisfaction was high. No differences were seen among professionals with different roles.

Discussion

The aim of this study was to gain insight into how sports and physical activity were integrated into the rehabilitation care. The results of the fidelity outcome showed that in all organizations sports and exercise activities were delivered as part of a rehabilitation treatment. In addition, this study demonstrated that in most organizations activities to stimulate sports and physical activity were to some extent integrated into rehabilitation, but they were not always delivered as a standard component of a rehabilitation treatment. Clearly, the total fidelity scores illustrated large variations among organizations.

The current implementation status was assessed at the start of the nationwide implementation of a sports and physical activity stimulation program (RSE program) into rehabilitation. Before the start of this nationwide implementation process, 9% of the approached organizations reported that they were not interested in the RSE program. Because these organizations were not recruited in the current study, the current sample of organizations may be biased. On the other hand, the fact that the majority of the approached organizations were interested in the implementation of the RSE program suggested that the managements of these organizations realized the importance of stimulating a physically active lifestyle in persons with disabilities. These findings are in line with the high and consistent satisfaction rates found in the current study. Together these results suggest that rehabilitation professionals support the idea to integrate sports and physical activities, including stimulation activities, into their rehabilitation treatment. This might be the result of the Dutch history on initiatives regarding sports and physical activity projects that were integrated over the past decades into the rehabilitation care. A possible mechanism

behind this history of projects is that Dutch rehabilitation care is strongly connected to rehabilitation research established by several collaborations between rehabilitation professionals and (human movement) scientists [19]. In addition, the implementation of the RSE program fits perfectly in the policy of the Netherlands Society of Physical and Rehabilitation Medicine (association of Dutch rehabilitation physicians) that may also have contributed to the fact that in general the participating rehabilitation professionals and their centres and hospital departments were interested in the adoption of the RSE program.

The fidelity of the implementation status was evaluated by calculating a total fidelity score per organization. To calculate this score a simple method was developed that gained insight into the quality of the implementation. In other words, the fidelity scores provided information on the extent to which activities to stimulate sports and physical activity during and after rehabilitation were implemented according to guidelines of the RSE program [17,18]. Although all organizations offered sports and exercise activities as part of a rehabilitation treatment, the topic 'sports and exercise during rehabilitation' was not always officially integrated into the policy of the organization. In the same way, this study showed that sports and active lifestyle stimulation activities (intake, face-to-face session, counselling) were delivered in most of the organizations, but not always as a standard component of the rehabilitation treatment protocol. Ideally, in the current nationwide implementation process [15], all involved organizations should continue working with the sports and physical activity stimulation program (RSE program) after the end of the period (2012 - 2015). It is therefore important that the implementation strategy of this process should also focus on the integration of the program components into the routines of the organizations. Organization of regular regional and national topic meetings may

be an appropriate strategy to discuss among professionals ways to effectively continue the program within the routines of the organization [20,21].

Nevertheless, the results of the total fidelity scores showed a large variation among organizations (range: 15% - 85%). This large variation indicates that an individual approach of the coordination and support of the current implementation process in participating organizations, which is performed by Stichting Onbeperkt Sportief [15], is also necessary. Activities, such as face-to-face visits, audits and feedback can be an effective way to facilitate the implementation process and to produce higher and more consistent degrees of fidelity [21-23]. On another note, variation in fidelity among organizations can be useful and helpful when professionals share knowledge and experiences at one of the meetings during the program period (2012 – 2015).

It is important to mention that the description of the implementation status regarding the integration of sports and physical activity in rehabilitation was based on the implementation status of the main components of the RSE program (i.e. intake, face-to-face consultation, counselling). It is possible that some of the participating organizations deliver sports and active lifestyle stimulation activities that were not included in the fidelity scores. This may result in an incomplete description of how sports and physical activities, including stimulation activities, are integrated into rehabilitation. In addition, several factors (such as support, resources, attitude) can influence the implementation of sports and physical activity into rehabilitation [24]. To explain and understand the variations among organizations, insight into influencing factors can be valuable. Moreover, information on these factors is important for a successful implementation process. Therefore, these aspects are monitored and evaluated during the whole period of the current implementation process (2012 – 2015).

This paper describes the method that was used to measure the current status of the integration of sports and physical activities in rehabilitation care by using components of an evidence-based program. This method can be seen as an example to measure how sports and physical activity, including stimulation activities, were integrated into rehabilitation in a structural and effective way. With the use of this method the content of the rehabilitation care regarding the integration of sports and physical activity can be compared easily both on a national and international level.

A limitation of the current method is that only fidelity and satisfaction were used to describe the implementation status. It might be valuable to include also information about the percentages of patients that are reached and about the amount of stimulation activities that are delivered (i.e. dose). Unfortunately, the cross-sectional data from the baseline questionnaire used in this study, did not contain information to measure these outcomes (reach and dose) objectively. Therefore, we were not able to include this information in the description of the implementation status. In the current nationwide implementation process of the RSE program, an online registration system is designed in which real-time data is obtained about the reach and dose of this program [14,15]. In future studies we will therefore be able to combine these longitudinally collected data with the fidelity and satisfaction outcomes in order to describe the implementation status in more detail. Moreover, this data can be used to evaluate the outcomes of the nationwide implementation process of the sports and physical activity stimulation program [15]. It can be expected that the evaluation of this implementation process can also lead to new

insights to further optimize the current described measure of integration of sports and physical activity in rehabilitation care.

The current study was carried out in the Dutch rehabilitation care. It should be realized that the content and organization of the rehabilitation care can differ among countries [11,25]. For example, a comparison of the rehabilitation treatment for spinal cord injury (SCI) between three countries (Norway, the Netherlands, Australia) showed that only in the Netherlands sports therapy was offered by licensed sports therapists [11]. These findings are in line with the results of the current study, but put them in an international perspective. Despite these possible differences between countries, the method described in this study can be easily applied to measure the integration of sports and physical activity in rehabilitation care in other countries. In this way, the content of a rehabilitation treatment regarding the integration of physical activity stimulation can be compared not only within countries, but also between countries.

Conclusions

The fidelity outcome showed that activities to stimulate a physically active lifestyle during and after rehabilitation were to some extent integrated into Dutch rehabilitation care, but these activities were not always delivered as a standard component of the rehabilitation treatment. These findings have emphasized the importance to focus on the integration of sports and physical activity into the routines of organizations. Professionals' satisfaction about sports and physical activity stimulation was high. Moreover, main components of an evidence-based program to stimulate sports and physical activity both during and after rehabilitation can be used

to measure the current status of the integration of sports and physical activity in rehabilitation care in a structural and effective way.

Acknowledgments

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Declaration of Interest sections

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CHAPTER 4

Professionals' perceptions of factors affecting implementation and continuation of a physical activity promotion program in rehabilitation: A qualitative study

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Abstract

Objective

To describe professionals' perceptions of factors that facilitate or hamper the implementation and continuation of a physical activity promotion program in rehabilitation.

Design

This study used a qualitative design.

Methods

Semi-structured interviews (n=22) were conducted with rehabilitation professionals (n=28) involved in the implementation of a physical activity promotion program. Two additional interviews were conducted with the program coordinators (n=2). The study involved eighteen rehabilitation organizations implementing the program that targets people with disabilities or chronic diseases. Organizations were supported in the implementation process by the program coordinators.

Results

Commonly perceived facilitating factors were: involvement of committed and enthusiastic professionals; agreement with their organizations' vision/wishes; the perceived additional value of the program; and opportunities to share knowledge and experience with professionals from other organizations. Commonly perceived hampering factors were: uncertainty about continuing the program; limited flexibility; and lack of support from physicians and therapists to implement the program.

Conclusions

Professionals perceived a heterogeneous set of factors that facilitate and/or hamper

the implementation and continuation of a physical activity promotion program in rehabilitation. Based on these findings, recommendations were formulated to enhance embedding of physical activity promotion during and after rehabilitation.

Keywords

People with disabilities, active lifestyle, sports, sustainability, rehabilitation professionals, semi-structured interviews

Introduction

In the Netherlands, sports activities are currently considered to be important components of effective rehabilitation care [1-3]. The embedding of sports into rehabilitation can play a role in promoting an active lifestyle in patients with disabilities. Unfortunately, research showed that the incorporation of sports during rehabilitation in itself was not enough to maintain an active lifestyle in all patients after discharge from rehabilitation [3]. Van der Ploeg et al. [3] showed the necessity to offer patients also a period of tailored counseling focusing on sports and daily physical activities after rehabilitation to attain a physically active lifestyle in their home setting. The results of this randomized control trial showed that self-reported physical activity levels of patients who received tailored physical activity counseling after rehabilitation, improved up to one year after discharge [3].

In the footsteps of these previous and positive findings, the evidence-based program 'Rehabilitation, Sports and Exercise' (RSE) was introduced and prepared for dissemination in Dutch rehabilitation care [4]. The RSE program is specifically targeting people with physical disabilities and/or chronic diseases to encourage them to participate in sports and daily physical activities during and after rehabilitation [4,5]. However, the implementation of a new program into rehabilitation practice is challenging [6,7]. The continuation of a program over an extended period may be even more difficult [8-11]. Insights into factors at the level of the organization that influence these processes are important to understand how and why the program is (not) successfully implemented and continued over time [12,13]. Although many studies have been conducted on the identification of factors influencing the implementation of evidence-based programs in healthcare settings [14,15], less is

known about enabling and constraining factors of the implementation and continuation of a physical activity promotion program (e.g. RSE program) in rehabilitation care.

Therefore, the aim of this qualitative study was to describe professionals' perceptions of factors that facilitate or hamper the implementation and continuation of a physical activity promotion program in rehabilitation.

Methods

Study design

A qualitative design using semi-structured interviews with rehabilitation professionals was chosen to gain in-depth insights about influencing factors to the implementation and continuation of a physical activity promotion program in different rehabilitation settings based on professionals' experiences, attitudes and expectations. The study is part of the Rehabilitation, Sports and Active Lifestyle (ReSpAct) study [4,5]. The study protocol was approved by the ethics committee of the Center of Human Movement Sciences of the University Medical Center Groningen. All invited professionals agreed to participate and approved to use the collected data for scientific purposes.

Setting

Professionals of twelve rehabilitation centers and rehabilitation departments of six hospitals were involved. The RSE program was implemented in all eighteen

organizations with support of a Dutch organization¹. Figure 4.1 illustrates the content of the RSE program. A detailed explanation of the RSE program has been described elsewhere [4,5].

The implementation of the program consisted of the following key steps:

- A structural embedding of sports and exercise during rehabilitation
- Setting up a Sports Counseling Center (SCC) to provide tailored (telephone-based) counseling after rehabilitation. All consultations at the SCC are based on motivational interviewing in order to realize a behavioral change regarding a physically active lifestyle at home.

Each participating organization appointed a project leader to coordinate the implementation of the program within the organization, and one or more counselors to execute the program [4,5]. Two national program coordinators were engaged to support and coordinate the implementation on a national level. Table 4.1 shows activities that were part of the implementation strategy.

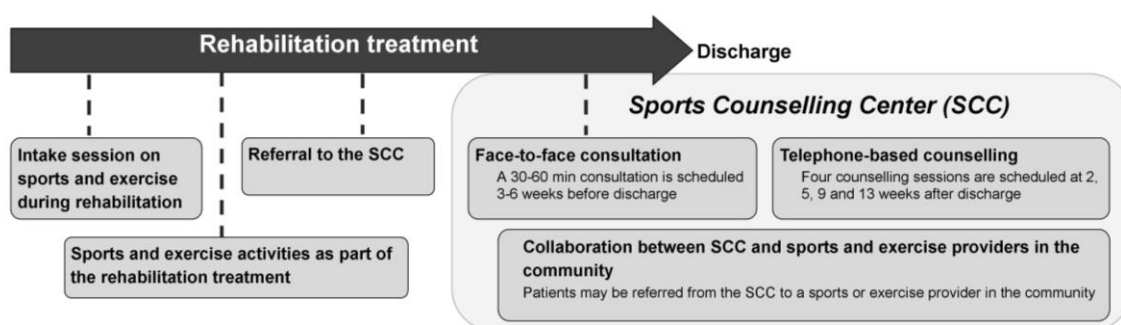


Figure 4.1

The content of the Rehabilitation, Sports and Exercise (RSE) program. The program consists of activities during and after a rehabilitation treatment.

¹ The name of this organization was 'Stichting Onbeperkt Sportief'. This national organization aimed for a larger participation within disabled sports and physical activity and the development of suitable and accessible sports facilities. From January 2016, Stichting Onbeperkt Sportief became part of Knowledge Center for Sport Netherlands.

Table 4.1

Activities related to the implementation strategy

The implementation strategy included:

- Providing financial incentives to each organizations (fixed amount of money)
 - Regular visits by program coordinators depending on organization's needs
 - Providing advisory support by program coordinators
 - Reviewing of project plans, annual plans and reports by program coordinators
 - Organizing national and regional meetings for professionals
 - Providing training courses in motivational interviewing to counselors
 - Providing material for the implementation and executing of the RSE program
-

Data collection

From the involved organizations (n=18), all project leaders and a selection of counselors were invited to participate in a semi-structured interview by researcher FH. Counselors were selected to participate if they were actively involved in the implementation of the RSE program. Prior to each interview, professionals were informed about the content and aims of the interview. Furthermore, both national program coordinators were invited to participate in an interview about their experiences with disseminating the program and perceived influencing factors.

Interviews with project leaders were conducted using a topic list that was based on a theoretical framework [16]. This framework displays three main phases of an introduction process (adoption, implementation, continuation), categories of determinants (socio-political, organization, program, professional, patients) and the implementation strategy [16].

Each interview started with an open question about professionals' general experiences with the RSE program. Thereafter, open questions were asked about

their experiences with the implementation of the RSE program and potential factors that influenced this process. Probing questions were asked about the way the RSE program was implemented and executed in the concerning organization. Furthermore, specific questions were prepared about professionals' experiences with activities that were part of the implementation strategy and initiated by program coordinators. Subsequently, project leaders and counselors were asked about their expectations on the continuation of the RSE program after program period (2012-2015) and possible influencing factors.

Appendix 4.1 depicts a diagram of the content of the interviews. Prior to each interview, professionals received this diagram by e-mail to motivate them to think about perceived facilitators and barriers. Moreover, this diagram was used as a tool to guide the interview.

The content and topic list of the interviews with the two program coordinators differed from the interviews with the project leaders and counselors. During the first interview with the program coordinators, open questions were asked about their experiences with the implementation of the RSE program within each organization separately (n=18). A second interview was conducted to obtain information about program coordinators' perceptions on facilitating and hampering factors to the implementation and continuation of the program in rehabilitation organizations.

Data analyses

All interviews were audiotaped and transcribed verbatim. To familiarize with the data, transcripts were read several times and a summary of each transcript was written. The first two transcripts were independently coded by FH and MvB using an open coding procedure [17]. Based on these two transcripts a code scheme including

potential facilitating and hampering factors was developed. Consequently, all transcripts were coded using this coding scheme by researcher FH, involved in the evaluation of the RSE program, and a second coder (MvB, research assistant 1 or research assistant 2). Coding was performed in ATLAS.ti (Scientific Software Development GmbH, Berlin, Germany). Meetings with all coders were organized to discuss discrepancies in coding procedures and to reach consensus. Afterwards, codes representing similar topics were combined into broader factors. Facilitating and hampering factors were then classified into the different groups of the theoretical framework [16]. Finally, results were discussed with an expert panel consisting of members with different backgrounds and expertise (physician/researcher RD, researcher CvS, researcher FJH). Two other members of the panel (LvdW and MD) reflected on the final results and recommendations. A selection of quotations was translated into English to illustrate the results.

Results

A total of 22 interviews with rehabilitation professionals (n=28) involved as project leader (n=21) or counselor (n=7), were held between November 2014 and March 2015. Of these 22 interviews, six interviews were conducted with two professionals (i.e. double interview design). Interview duration ranged from 40 to 115 minutes (mean: ±70 minutes). Two interviews with duration of ±80 minutes per session were conducted with the two program coordinators in October 2014 and April 2015. Table 4.2 gives an overview of the rehabilitation setting and characteristics of the conducted interviews.

Table 4.2

Setting and characteristics of all conducted interviews (n=24)

Interview	Professionals' role^b	Setting	Interview design^c
I1	Project leader + manager	Hospital + center	Single
I2 ^a	Counselor	Hospital + center	Single
I3	Project leader (previous) Project leader (current)	Hospital	Double
I4 ^a	Counselor	Hospital	Single
I5	Project leader	Hospital	Single
I6	Project leader + manager Project leader + counselor	Hospital + center	Double
I7	Project leader Counselor	Center	Double
I8	Project leader + manager	Center	Single
I9	Project leader + counselor	Center	Single
I10	Project leader + manager	Center	Single
I11	Project leader + manager	Hospital	Single
I12 ^a	Counselors (n=2)	Hospital	Double
I13	Project leader	Hospital	Single
I14	Project leader	Center	Single
I15	Project leader + manager	Center	Single
I16	Project leader + counselor	Center	Single
I17	Project leader	Hospital	Single
I18	Project leader + counselor	Center	Single
I19	Project leader	Center	Single
I20 ^a	Counselor	Center	Single
I21	Project leader (previous) Project leader (current)	Center	Double
I22	Project leader Counselor	Center	Double
I23	Program coordinators (n=2)	n/a	Double
I24	Program coordinators (n=2)	n/a	Double

^a Interviews were conducted by a research assistant. n/a = not applicable.^b Some professionals fulfilled two roles (e.g. project leader + manager or project leader + counselor).^c A double interview design indicates that the interview was conducted with two professionals.

Facilitating and hampering factors

Tables 4.3 and 4.4 show the perceived facilitating and hampering factors reported by professionals for the implementation and continuation of the RSE program. A selection of quotations to illustrate the findings is presented in table 4.5.

Professionals mentioned factors related to the following categories: 'socio-political context', 'organization', 'program', 'professional', 'patients' and 'implementation strategy'. Factors related to the 'patients' were only mentioned in the implementation phase. A few factors were only stated by professionals working in a general hospital (table 4.3 and 4.4).

Counselors mainly talked about factors related to the execution of the program, such as the flexibility of providing counseling sessions, the additional value of the program and characteristics of their patients. Project leaders named factors related to diverse categories both more on a management level (e.g. organizations' vision/wish, financial aspects) as well as on a more practical level (e.g. flexibility and compatibility of the program). The two program coordinators emphasized the engagement of physicians in the implementation and the support from rehabilitation professionals within the organization to implement and continue the RSE program. The next section provides a detailed description of perceived facilitating and hampering factors.

Table 4.3

Facilitating and hampering factors to the implementation of the “Rehabilitation, Sports and Exercise” program

Categories	Facilitating factor	Hampering factor
a) Socio-political context	<ul style="list-style-type: none"> - Collaboration with and (financial) support from the local municipality^b - Collaboration and network between SCC and external parties were good and/or improved^b - Possibilities to participate in sports and exercise activities for disabled persons were good and/or enlarged 	<ul style="list-style-type: none"> - Local municipality had ended the financial support^b - Uncertainty about how to continue the RSE program after 2015^b - Possibilities to participate sports and exercise activities for disabled persons were limited
b) Organization	<ul style="list-style-type: none"> - The content of the program is in line with organizations' vision and/or wishes^b - (More) structural integration of sports and exercise in rehabilitation care^b - Sufficient sports and exercise facilities within the organization - The support from rehabilitation professionals to implement the program was good and/or improved^b - Communication and collaboration among departments/professionals were good and/or improved^b - Referral of patients to SCC was a standard procedure of rehabilitation treatment - All members of multidisciplinary team could refer patients to SCC - Availability of (additional) financial resources - Good collaboration between rehabilitation department in hospital and a surrounding rehabilitation center^{a,b} - Knowledge and visibility of the program (SCC) were good and/or improved 	<ul style="list-style-type: none"> - No wish to implement the program^a - Sports and exercise were no key points of attention in hospital care^{a,b} - Limited sports and exercise facilities in hospital^{a,b} - Lack of support from physicians and therapists to implement and execute the program^{a,b} - Poor communication and collaboration between counselors and physiotherapists^b - Poor collaboration among involved professionals - Referral of patients to SCC was dependent one professional (physician) - Insufficient financial resources to meet organizations' wishes regarding implementation of the RSE program - Implementation of the program at more departments/locations of the organization - Changes in organization (such as fusion, reorganizations, staff turnover) - Lack of knowledge and bad visibility of the program (SCC) within organization
c) Professionals		
- Counselor	<ul style="list-style-type: none"> - Being committed and enthusiastic to implement the program^b - Being a member of the multidisciplinary rehabilitation team - Receiving support from colleagues to implement the program (other counselors, project leader, managers) - Good skills and knowledge to implement and execute the RSE program 	<ul style="list-style-type: none"> - Lack of motivation to implement the program - Being appointed from outside the organization - Limited available time to implement and execute the program - Lack of support from project leader/managers
- Physician	<ul style="list-style-type: none"> - Actively involved in the implementation of the program - Enthusiastic to implement the program - Positive attitude towards the implementation of the program - Sufficient knowledge of the content and aim of program 	<ul style="list-style-type: none"> - Lack of time - Negative attitude towards implementation of the program^a
- Project leader	<ul style="list-style-type: none"> - Being committed and enthusiastic to implement the program^b - Good skills and knowledge to implement the program - Working as a counselor in SCC or being a manager of a department 	<ul style="list-style-type: none"> - Limited available time for the implementation of the program - High work load - Insufficient knowledge about the content of the program - Not actively involved in the

		implementation of the program
d) Program	<ul style="list-style-type: none"> - Additional value of RSE program (particularly counseling sessions) was clear^b - Outcomes of the RSE program on patient level were visible for involved professionals^b - Content of program was clearly described (Handbook) - Most components of the program could be reimbursed by insurance companies - RSE program was easily compatible with current rehabilitation care - A flexible execution of the counseling sessions^b - Motivational Interviewing as basis for conversations 	<ul style="list-style-type: none"> - Program was difficult to understand - Work load was increased due to additional administrative tasks - Reimbursement of counseling sessions was not possible - Adjustment existing working procedures was necessary to implement the program - Name 'Sports Counseling Center' could lead to wrong expectations - Execution of the ReSpAct study - Planning of telephone based counseling sessions - Protocol of counseling sessions was not suitable for all patients^b
e) Patient	<ul style="list-style-type: none"> - Being in high stages of behavior change towards physically active lifestyle^b - Committed to participate in sports and exercise activities^b - Positive attitude towards sports and exercise activities^b 	<ul style="list-style-type: none"> - Low stages of behavior change towards physically active lifestyle^b - Low social economic status^b - Non-western origin - Children/ adolescents
f) Implementation strategy	<ul style="list-style-type: none"> - Financial incentives^a - Sharing of knowledge and experiences with other professionals^b - Material provided to implement and execute the program - (Advisory) support from program coordinators - Writing project plan, annual plan and reports - Regional and national meetings were inspiring delivered valuable contribution^b - Course in Motivational Interviewing^b 	<ul style="list-style-type: none"> - Period of financial support was too short^b - Writing project plan, annual plans and reports was time-consuming
- National level	<ul style="list-style-type: none"> - Creating awareness and knowledge about the program (give presentations, sending e-mails, newsletters)^b - Reminding^b 	
- Organizational level	<ul style="list-style-type: none"> - Registration and evaluation of outcomes of RSE program within organizations - An individual action plan to implement the program 	

^a Only in hospital setting; ^b Detailed description is included in main text; SCC = Sports Counseling Center; RSE = Rehabilitation, Sports and Exercise; ReSpAct study = Rehabilitation, Sports and Active lifestyle study. The ReSpAct study is designed to evaluate the RSE program [4,5].

Table 4.4

Facilitating and hampering factors to the continuation of the “Rehabilitation, Sports and Exercise” program

Categories	Facilitating factor	Hampering factor
a) Socio-political context	<ul style="list-style-type: none"> - Collaboration among organizations/ stakeholders in rehabilitation care at national level^b - Collaboration with and (financial) support from the local municipality^b 	<ul style="list-style-type: none"> - Uncertainty about how to continue the RSE program after 2015^b
b) Organization	<ul style="list-style-type: none"> - The content of the program is in line with organizations' vision and/or wishes^b - Structural integration of sports and exercise in rehabilitation care^b - Sufficient support from physicians and management to continue the program^b - Wish and expectation to continue the RSE program 	<ul style="list-style-type: none"> - Sports and exercise were no key points of attention in hospital care^{a,b} - Lack of financial resources to continue all components of the RSE program
c) Professionals (counselor; physician, project leader)	<ul style="list-style-type: none"> - Positive attitude towards continuation of the program^b - Enthusiasm to continue the program^b 	<ul style="list-style-type: none"> - Counselor was appointed from outside the organization during implementation period^b
d) Program	<ul style="list-style-type: none"> - Additional value of RSE program (particularly counseling sessions) was clear^b - Most components of the program could be reimbursed by insurance companies - Possibility to be more flexible in execution of the counseling sessions^b - Conclusions of the ReSpAct study 	<ul style="list-style-type: none"> - Reimbursement of counseling sessions was not possible - Lack of financial incentives from “Onbeperkt Sportief”
e) Implementation strategy	<ul style="list-style-type: none"> - Sharing of knowledge and experiences with other professionals - National and regional meetings 	

^a Only in hospital setting; ^b Detailed description is included in main text; SCC = Sports Counseling Center; RSE =Rehabilitation, Sports and Exercise; ReSpAct study = Rehabilitation, Sports and Active lifestyle study. The ReSpAct study is designed to evaluate the RSE program [4,5].

Table 4.5

Examples of quotations to illustrate the findings

Factor	Example of quotation
Collaboration with and (financial) support from the local municipality (F)	<i>"The local municipal government set up the Sports Counseling Center in 2010. And they [municipal government] paid also for it [Sports Counseling Center]" [14]</i>
(More) structural integration of sports and exercise in rehabilitation care (F)	<i>"We have been working for years now to improve the position of the 'Sports and Exercise therapy' department. And we are trying to create a more equal position of sports therapy within the rehabilitation team. [...] and the implementation of this [RSE] program has definitely positively contributed to that process." [16]</i>
No wish to implement the program (H)	<i>"Setting up the Sports Counseling Center was initiated by our manager without any support from other professionals working in our department. So it was basically shoved down our throats. And that created resistance against the plan." [15]</i>
Lack of support from physicians and therapists to implement and execute the program (H)	<i>"We [sports therapists] will never get a similar status compared to the physiotherapists. That would be impossible. The status of the physiotherapists is a very important part of the rehabilitation treatment for both patient and physician." [16]</i>
Content of program was clearly described (Handbook) (F) A flexible execution of the counseling sessions (F)	<i>"It is good that there is a guideline available for the execution of the program. It helps to select proper moments for calling patients. But indeed, sometimes it is better to deviate from the guideline." [12]</i>
Additional value of RSE program (particularly counseling sessions) was clear (F)	<i>"I notice that patients are very enthusiastic about the guidance, and they [patients] are especially enthusiastic about the counseling part" [12]</i> <i>"It means that we are able to provide better care, especially as a result of the counseling sessions after rehabilitation" [16]</i>
(Advisory) support from program coordinators (F)	<i>"The program coordinator was the person who contacted us with or without a request. His/her enthusiasm was inspiring." [10]</i>
Creating awareness and knowledge about the program (F) Reminding (F)	<i>"You give a presentation, people are interested, committed and enthusiastic. But after 4 weeks, they have forgotten all about it or they did not pay attention to it anymore [...] so you have to remind them, and remind them." [16]</i>

F=facilitating factor; H= hampering factor.

Socio-political context*Network*

During implementation, almost all organizations have started or have strengthened their collaborations with the municipal governments, non-profit foundations and/or providers of sports activities, such as sports clubs or fitness clubs. Good collaborations and a good network enabled counselors to gain (up-to-date) information about possibilities to participate in sports and exercise activities for disabled persons in the region.

Uncertainty about the continuation

Almost all professionals expressed their uncertainty about the continuation of the program after 2015 (table 4.4a) which was thought to be related to the expected changes in the financial system of the Dutch rehabilitation care. Since, in general, financial resources for healthcare have been under pressure, professionals were worried about the future and some managers were therefore restrained in their decisions to expand the SCC.

To overcome this uncertainty, professionals suggested the importance to continue the nationwide cooperation among rehabilitation organizations after program period. This could help to share ideas and seek for financial possibilities to embed the RSE program into the routines of the organizations after the program period.

Organization*Vision and wishes*

A commonly mentioned facilitating factor for both phases was the fact that the content of the RSE program was in line with the organizations' vision and/or wishes (tables 4.3 and 4.4). In some organizations there was already an operating SCC before the start of the program period. Participating in the RSE program gave them the opportunity to implement a SCC at more locations of their organization and/or to intensify and expand the guidance at the existing SCC. Other professionals reported that participating in the RSE program provided the opportunity to integrate sports and exercise, including tailored counseling, in a more structural way.

Moreover, almost all professionals experienced that sports and exercise had received a more important and structural place into rehabilitation care by implementing the RSE program. Several professionals highlighted the impact of the implementation process on the position of the department 'Sports and Exercise therapy' and the position of sports therapists² in the multidisciplinary rehabilitation team (table 4.5).

Support from rehabilitation professionals

Support from rehabilitation professionals from all levels (managers, physicians, therapists) was a commonly perceived influencing factor (table 4.3b and 4.4b). At the start of the implementation, some professionals encountered insufficient support from physicians and/or therapists to execute the RSE program, which hampered the referral of patients to the SCC. Consequently, both project leaders and counselors have spent a lot of effort in creating a committed environment regarding the promotion of sports and physical activities during rehabilitation. For the continuation phase, support from managers and physicians was emphasized as an important

² Sports therapists are health professionals educated to help and/or encourage people with disabilities or chronic diseases to participate in sports and exercise activities.

influencing factor, since these professionals can have an impact on decision making processes (table 4.4b).

One project leader working in a hospital was not satisfied with the decision to implement the RSE program (table 4.5). The project leader explained that the involved manager decided to participate in the RSE program, despite the fact that physicians of the rehabilitation department did not support it. One reason for the lack of support, as reported by the project leader, was that most patients who were treated at the rehabilitation department were not eligible to be referred to the SCC. In addition, facilities for sports and exercise activities in that concerning hospital were perceived limited and experienced as a barrier to the integration of sports and exercise during rehabilitation.

Physiotherapy and sports therapy

A commonly perceived barrier was the lack of support from physiotherapists to refer patients to the SCC. Several physiotherapists did not see the necessity of setting up a SCC. Professionals recognized a hierarchy in which physiotherapy was seen as a more important component of a rehabilitation treatment than sports therapy. Improving the communication and collaboration between sports therapists and physiotherapists was a successful way to overcome this barrier in one hospital. On the other hand, in other organizations, the lack of support from physiotherapists remained a hampering factor (table 4.5).

Sports and exercise promotion in hospital care

Most rehabilitation departments of hospitals did not recognize act4.4e lifestyle as a key point of attention in their provided care. This resulted in uncertainty about future

plans among professionals in hospitals. The collaboration between a rehabilitation department in a hospital and a neighboring rehabilitation center was reported as a facilitating factor to the implementation and continuation of the RSE program in a hospital setting, since rehabilitation centers were in general more '*sport minded*' compared to hospitals.

Professional

Committed and enthusiastic counselors

Almost all professionals stated that the involved counselors were committed to and enthusiastic about the implementation of the RSE program (table 4.3c). This enthusiasm was reported as an important factor to successfully implement the program, because counselors had a major role in promoting the RSE program (including SCC) within their organization and in creating support from their colleagues. In addition, professionals mentioned that rehabilitation professionals who were not committed to execute the RSE program were not selected to work as a counselor in the SCC.

Engagement of a rehabilitation physician

For many professionals, the engagement of physicians in the implementation was reported as a facilitator for the implementation and continuation of the program (table 4.3c and 4.4c). Since physicians play a key role in the multidisciplinary team, it was important that they had a positive attitude towards the RSE program. Furthermore, professionals explained that an enthusiastic and committed physician could enable the implementation by creating support from their physician colleagues.

Program

Additional value

Almost all professionals were positive about the content and nationwide design of the RSE program. Moreover, the additional value of the RSE program, especially the tailored counseling sessions, was clear for all professionals (table 4.5). Counselors experienced that the guidance they provided to their patients was effective, which was a clear stimulating factor.

Flexibility

Despite the fact that professionals were very positive about the program, they also mentioned that counselors experienced difficulties to apply the protocol of the counseling sessions to all patients. Counselors preferred to be more flexible in the number and moments of counseling sessions to be more in line with needs and wishes of their patients. Because several counselors perceived problems to reach patients by telephone, counseling sessions were sometimes performed by email. In general, counselors had positive experiences with performing counseling sessions by email. They mentioned that the counseling by e-mail was time-consuming and could be carried out in a more flexible way. However, most counselors preferred a telephone conversation with their patients. Almost all professionals reported that a more flexible execution of the counseling sessions was required for the continuation (table 4.4d).

Patients

According to the professionals, patients participating in the RSE program generally had a positive attitude towards physical activities and appreciated the tailored support from the SCC. Counselors experienced that the support to patients in low stages of behavioral change (low level of motivation) was more challenging compared to patients in higher stages of behavioral change (high level of motivation). The socio-economic status of patients also played a role in the execution of the program. Some patients had limited financial resources to engage in physical activities, which hampered a referral of patients to activities outside the organization and/or in personal environment.

Implementation strategy*Activities on national level*

Professionals reported that financial incentive gave the opportunity to accelerate the implementation process. However, some professionals preferred to receive financial incentives over a longer period.

The extent to which professionals communicated with program coordinators and received advisory support varied among organizations. Independent of the degree of provided support, professionals experienced it as a positive factor (table 4.5).

For almost all professionals, the meetings organized with the involved professionals contributed positively to the implementation and continuation of the RSE program. Professionals emphasized the additional value of sharing knowledge and experiences with professionals from other organizations. The planning of meetings

for a selection of professionals, such as meetings for managers/project leaders and meetings for counselors, provided additional benefits.

Project leaders and counselors were very positive about the structured training in motivational interviewing and highlighted the broad possibilities for application to general rehabilitation care.

Activities at organizational level

To create awareness and to provide information about the RSE program within the organization, project leaders and counselors gave oral presentations to other departments in the organizations, e-mailed information to colleagues and/or published information on the internal website/newsletter of the organization. Professionals highlighted the importance of regularly repeating these activities (table 4.5).

Discussion

The results of this study showed that professionals perceived a heterogeneous set of factors that facilitated or hampered the implementation and continuation of a physical activity promotion program in rehabilitation care. Some factors, such as collaboration with other organizations, financial resources, organizations' vision/wishes, support from professionals, uncertainty about future, and additional value of the program, were reported to influence both phases. Other factors were only perceived as influencing factor during implementation (e.g. collaboration among professionals within the organization, patients' characteristics, activities related to the implementation strategy) or continuation (e.g. conclusions of the ReSpAct study).

Literature showed that financial resources/reimbursement, time available, professionals' attitude and support from organization are frequently cited influencing factors to the implementation of a physical activity (promotion) program in rehabilitation care [18-22] or in primary healthcare [15,23,24]. These factors were also reported by professionals involved in the current study to hamper and/or facilitate the implementation process. Some factors specifically related to the RSE program (e.g. name of 'sports counseling center', linked ReSpAct study, motivational interviewing) were not mentioned at an earlier stage in literature.

In contrast to previous studies [14,25,26], lack of knowledge or skills to implement the program was not experienced as a hampering factor by professionals in the current study. An explanation might be that the professionals involved in the current study were actively supported during the implementation. Several activities related to the implementation strategy (i.e. meetings, courses in motivational interviewing, up-to-date materials) may have contributed to the fact that the professionals did not report lack of knowledge and skills as a hampering factor. Although the effectiveness of using a multifaceted strategy to support an implementation process is debatable [7,27,28], the experiences of the professionals in the current study suggest that the different activities used to support the implementation of the RSE program may have contributed positively to this process. The question remains, however, whether the combination of activities applied in the current study was the most optimal and efficient way to successful implementation. Future research should therefore focus on (cost)effectiveness of (combinations of) activities to support the implementation and continuation of physical activity promotion in rehabilitation.

Although professionals were very positive about the implementation process and were supported to successful implementation, they all expressed their uncertainty

about the continuation of the program. Almost all factors (e.g. reimbursement, vision/wishes of the organization, collaboration, professionals' attitude/motivation) that were perceived by professionals as influencing the continuation of the program were stated in previous literature on influencing factors of physical activity promotion in primary healthcare [23,26]. However, no studies have been found focusing on the identification of factors influencing the continuation/sustainability of a physical activity promotion program in rehabilitation care. The importance of distinguishing between phases has been pointed out several times [14,16,26,29,30]. As shown in the current study and based on previous literature conducted in other healthcare settings [8,14,15,26,31], we know that reimbursement of the program, effectiveness of the program and policy of the organizations are important factors to successfully continue a physical activity promotion program.

In addition to these findings, we formulated recommendations based on three "umbrella" factors that may contribute to the sustainability of the performing activities to promote physical activity during and after rehabilitation (table 4.6). The first factor is the flexibility of the program. Professionals in the current study mentioned that a more flexible execution of the program was required to continue the program within the context of their organization. Since rehabilitation care is characterized by a multidisciplinary setting with a heterogeneous patient group, the program should allow a flexible approach. The importance of adapting an evidence-based program to the healthcare context has been highlighted by several other researchers [8,32,33]. According to Damschroder *et al.* [32], a program includes "key components" and "adaptable elements". To maintain effectiveness of the program, these "key components" should be implemented according to the protocol, while changes may be allowed in the "adaptable elements". In the current study, the "key

components” of the RSE program were clearly defined (i.e. intake, face-to-face sessions, counseling) [4]. Concerning the “adaptable elements”, we do not know how many and what kind of adaptations (i.e. mail-based counseling, use of other social media) are acceptable to maintain the desirable outcomes on patient level. Although different adaptations may have a different influence on patient outcomes [8,34,35], adaptations seem essential to sustain the program within the organization [8,33]. As a result, the way physical activities are integrated in rehabilitation may differ between patient groups and between organizations. Based on literature from other settings [33,36], this variation may be used to further optimize the procedure of embedding physical activities into rehabilitation care. Collecting data about the number and type of adaptations made within each organization, is therefore highly recommended [36].

The second factor is the attitude of the professionals. All professionals emphasized the enthusiastic and committed counselors and physicians as being important for implementing and continuing the program. They highlighted that it is important to continuously create awareness, knowledge and support related to performing physical activities during and after rehabilitation among all members of the multidisciplinary team. To ensure that this will continue on the longer term, we recommend to appoint (a group of) professionals working in the organization who are responsible for a structural embedding of physical activities into rehabilitation. In this way, a ‘local ownership’ is created, which has been previously shown to contribute positively to successful sustainability [31,33,37,38].

In Dutch rehabilitation care, most rehabilitation centers and some rehabilitation departments of hospitals included ‘Sports therapy’ as a separate field in rehabilitation care, which has the responsibility to embed sports and physical activities into rehabilitation [1]. However, the current study showed that some professionals

experienced a lack of support from physiotherapists to embed physical activities into rehabilitation. In line with previous literature [27,39] we found that good communication and collaboration between members of the multidisciplinary team (e.g. sports therapists, physiotherapists, physicians) during implementation seems also essential for successful continuation. Again, a 'local ownership' may facilitate this process.

The third factor is the nationwide collaboration. To overcome future barriers, professionals suggested continuing the nationwide collaboration among organizations. Again, to ensure the continuation of this collaboration, a (group of) professionals or a foundation should be responsible for this. In the same way, a 'nationwide ownership' should be established. Previous studies showed that such an ownership may facilitate the sustainability of evidence-based programs in healthcare settings [31,33]. In the current study, the program coordinators organized a membership of the RSE program which includes continuous (advisory) support, information and up-to-date materials from program coordinators. All rehabilitation centers and rehabilitation departments of hospitals are invited to become a payed member of the RSE program after program period (2012 – 2015). In this way, a 'national ownership' is created and collaboration among organizations on national level may continue, which is expected to strengthen the RSE program. This may positively contribute to a structural embedding of physical activities into rehabilitation on long term.

A limitation of this study is the possible selection bias. We only selected professionals working in one of the organizations participating in the RSE program [4]. It is likely that these professionals were in general more positive about the implementation of the physical activity promotion program compared to other rehabilitation

professionals. Furthermore, professionals received support during the implementation phase with the use of a multifaceted strategy. This may explain why, in general, professionals were very positive about the implementation process. Future studies should investigate whether rehabilitation professionals working in organizations that were not supported in implementing a physical activity promotion program, perceive other facilitating and hampering factors. On the other hand, because organizations received support during the implementation phase, the start of the continuation phase was clearly defined. Therefore, professionals were able to distinguish between factors that influence the implementation and/or continuation. Another limitation of the current study is that we did not collect data about influencing factors perceived by physicians. It is therefore possible that we missed some important information. However, our sample still consisted of a heterogeneous group of professionals that perceived a heterogeneous set of influencing factors. Lastly, in this study we built upon successful results of a previous RCT using self-reported physical activity outcome measures [3]. It is thus possible that the successful results of this previous RCT may be overestimated [40]. Therefore, the ReSpAct research group is currently re-evaluating the outcomes of the RSE program on patient-level [5]. Although the ReSpAct study uses also self-reported measures, longitudinal data are available from a large and heterogeneous study population (N=1719). Moreover, objective data of physical activity levels are obtained from a subgroup of patients in order to gain insight into the validity and reliability concerning self-reported physical activity measures in the context of the present study.

In conclusion, rehabilitation professionals perceived a heterogeneous set of factors that facilitate or hamper the implementation and continuation of a physical activity

promotion program in rehabilitation care. We formulated three recommendations to enhance (further) embedding of physical activity promotion during and after rehabilitation: 1) implement key components of an evidence-based procedure and adapt these to the local multidisciplinary context; 2) establish a local ownership; 3) establish a national ownership.

Table 4.6

Recommendations to enhance (further) embedding of physical activity promotion activities during and after rehabilitation.

Recommendations for future

- 1) Implement key components of an evidence-based procedure that integrate physical activities into rehabilitation (e.g. RSE program) and adapt this procedure to the local multidisciplinary context.

 - 2) Establish a local ownership by selecting committed and enthusiastic professional(s) who are responsible for the implementation *and* continuation of physical activities into rehabilitation.

 - 3) Establish a national ownership by selecting a foundation or (group of) professionals that is responsible for nationwide cooperation between organizations to overcome future barriers related to the integration of physical activities into rehabilitation.
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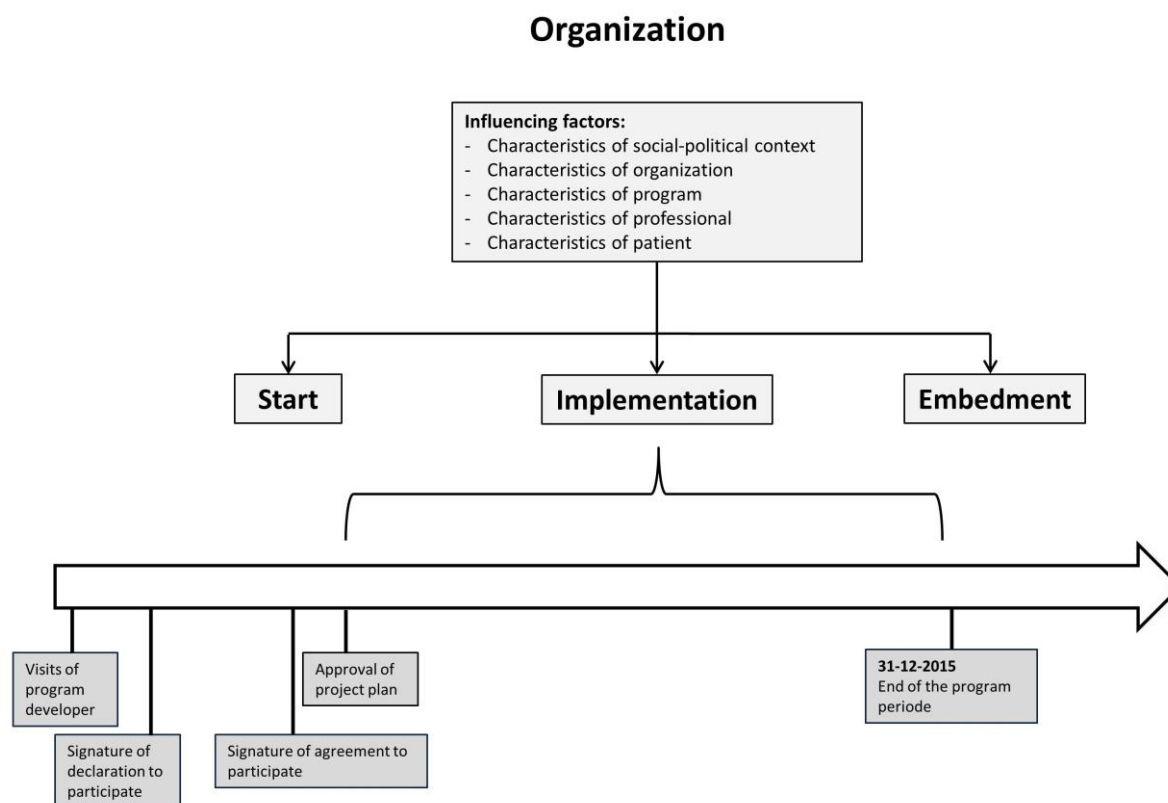
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Appendix 4.1

Visual overview of content of the interview with rehabilitation professionals.



Professionals received this diagram by e-mail in order to motivate professionals to think about perceived facilitators and barriers. The diagram was based on the theoretical framework of Wierenga et al. (2013). The 'start', 'implementation' and 'embedment' represent the three main phases (adoption, implementation, continuation) of the theoretical framework. The grey box with 'influencing factors' contains the five categories of the 'implementation determinants' presented in the framework. The activities related to the implementation strategy were not included in the diagram that was sent to professionals prior to the interview, but these were added to the diagram and explained by the researcher at the end of the interview. Moreover, this diagram was used as a tool to guide the interview. Dates of signature of declaration to participate, signature of agreement to participate and the official approval of the project plans varied among organizations.

CHAPTER 5

The implementation of a physical activity counseling program in rehabilitation care: findings from ReSpAct

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Under review

Abstract

Background: The nationwide implementation of a physical activity promotion program includes the establishment of “Physical Activity Counseling Centers”. This provides people with disabilities with motivational interviewing-based counseling after rehabilitation. Studying the implementation process may contribute to opening the black box of what counseling characteristics are associated with successful physical activity.

Objectives: To evaluate the implementation of a physical activity counseling program in rehabilitation and to investigate which (combination of) counseling characteristics are associated with changes in physical activity outcomes.

Design: Prospective multicenter cohort study.

Setting: Eighteen rehabilitation institutions (26 counseling centers).

Participants: Rehabilitation professionals (n=±70) and patients (n=1719).

Methods: Data were collected prospectively using three annual surveys filled out by professionals and two surveys filled out by patients. Latent class analyses were conducted to identify profiles of received counseling characteristics and multilevel models were used to investigate associations with physical activity outcomes.

Main outcome measurement: Implementation was evaluated using four process outcomes (reach, dosage, satisfaction, maintenance). Patients’ physical activity outcomes included the change in total minutes/week of physical activity and sport participation between baseline (3-6 weeks before discharge) and follow-up (14 weeks after discharge).

Results: 5873 Patients were reached via one of the 26 centers (reach). Professionals and patients were positive about the program (satisfaction). Sixteen

institutions (89%) formally agreed to continue the program (maintenance). The four identified profiles of counseling characteristics illustrate a large variation in received counseling among patients (dosage). No substantial differences in physical activity outcomes were found between profiles.

Conclusion: Establishing ‘Physical Activity Counseling Centers’ is an essential aspect of developing a promising and sustainable strategy to connect rehabilitation care and community-based physical activities. Although there was large variation in the actual received counseling, this did not coincide with large differences in physical activity outcomes suggesting opportunities to further optimize tailored counseling for people with disabilities.

Keywords

Active lifestyle, tailored counseling, physical disabilities, knowledge-translation, health promotion, latent class analysis

Background

Since physical activity (PA) levels remain lower in people with disabilities and/or chronic diseases compared to able bodied, promoting PA is of great importance for this heterogeneous population [1,2]. A large number of studies describe approaches or programs to promote PA among disabled persons [3-8]. Besides promotion in community settings, promotion in a rehabilitation setting has been proposed as an effective and sustainable strategy [9-11]. However, implementation of an evidence-informed program to promote PA in rehabilitation care does not occur spontaneously. Several factors may challenge successful implementation of a PA program in rehabilitation care.

Firstly, implementing a PA program in rehabilitation care can be complex due to the multidisciplinary setting and the heterogeneous target population [12,13]. Secondly, a program aiming to promote PA often consists of different aspects. In a heterogeneous setting such as rehabilitation, it may be a challenge to implement all aspects of the program according to the originally developed protocol, and this may subsequently influence patient-level outcomes [14]. Furthermore, the success of implementation and execution of a PA program in rehabilitation can vary over time due to changes on both the patient- as well as the institutional level. For example, there may be changes related to the socio-political context (e.g. changes in health insurance), to the institutions (e.g. reorganizations) or to the professionals (e.g. changes in time available, workload) [15-18].

Since both the way a PA program is delivered by professionals working in an institution as well as how it is received by patients are closely associated with the outcomes of the program on patient level [14], it is of great importance to collect data

at both levels. Several theoretical frameworks exist to guide the evaluation of implementation processes [19]. An example is the theoretical framework of Wierenga *et al.* [18] where commonly used frameworks (e.g. RE-AIM) are combined into one framework [15,20-23]. This framework distinguishes three phases of introducing a program into daily practice; the adoption, implementation and continuation phase. Different process outcomes (e.g. reach, dosage, satisfaction) are defined for every phase to guide evaluation [18].

An example of an evaluation on institutional level guided by this framework is the nationwide implementation of a PA program called 'Rehabilitation, Sports and Exercise' (RSE) [24]. This evidence-informed program [10,11] aims to promote sports, PA and active lifestyle in people with physical disabilities and/or chronic diseases during and after a rehabilitation treatment [24,25]. The implementation of the program involves "PA Counseling Centers" that are operated to offer PA counseling after rehabilitation. Since rehabilitation patients are recognized as a heterogeneous population, tailored counseling after rehabilitation is essential for realizing PA behavior change and maintaining an active lifestyle [11]. Simultaneously, counseling sessions may help patients to make the step from PA in rehabilitation care to sustainable PA in the community [6,9,26].

To optimize connections between rehabilitation care and community-based PA across the country, a nationwide approach was developed to implement the RSE program (i.e. realize 'PA Counseling Centers') [24]. The national coordinators, who are the owners of the program, developed a multifaceted strategy to facilitate the implementation process in eighteen rehabilitation institutions across the country. Furthermore, an independent research group collected detailed information on the way the program was implemented and executed in the participating rehabilitation

institutions over time with the aim to explain why the RSE program is effective (or not) and thus aiding the further optimization of PA counseling after rehabilitation [24,25].

Therefore, the aims of this study were 1) to evaluate the implementation of a PA counseling program (i.e. the RSE program) in rehabilitation over a three-year period, and 2) to develop distinct profiles based on received counseling characteristics and investigate which counseling profiles are associated with changes in patients' PA outcomes (i.e. what works for whom).

Ultimately, this study aims to contribute to the opening of the black box of what aspects of the PA counseling program specifically promote an active lifestyle after rehabilitation.

Method

Study design

This study is part of the "Rehabilitation, Sport and Active Lifestyle" (ReSpAct) study, a longitudinal cohort study on the RSE program executed in eighteen institutions (twelve rehabilitation centers and six rehabilitation departments of hospitals) across the Netherlands [24,25]. Since tailored counseling is a pivotal element of the RSE program [10,11], this study was specifically focused on the implementation of the 'PA Counseling Centers' and its associations with short-term outcomes on patients' PA behavior. The process evaluation was guided by a theoretical framework [18] and based on four commonly reported process outcomes [23], namely reach, dosage, satisfaction, and maintenance. In addition, the construction of distinct profiles based on the counseling characteristics was used to gain insight into the implementation on

patient level. Data were thus collected on the level of the institution (i.e. professionals) and the patient and through different methods (surveys, online registration system, logbooks).

The ‘Rehabilitation, Sports and Exercise’ program

The overarching goal of the RSE program is to promote an active lifestyle in persons with physical disabilities and/or chronic diseases receiving any kind of rehabilitation care by encouraging a PA behavioral change [24,25]. The full RSE program focuses both on integrating PA and sports during the rehabilitation treatment as well as on promoting an active lifestyle after discharge from rehabilitation. The former is achieved by integrating different PA and sports in the multidisciplinary rehabilitation program, while the latter is achieved by setting up ‘PA Counseling Centers’ in which patients receive face-to-face consultation and tailored counseling on active lifestyle after rehabilitation. The consultations and counseling sessions are offered by PA counselors and based on motivational interviewing (MI) in order to realize a behavioral change [27]. During the tailored guidance, patients can be referred from the ‘PA Counseling Center’ to a community-based PA or sport provider. The counselors in the ‘PA Counseling Centers’ are therefore the ‘connectors’ between rehabilitation-based and community-based PA and sports. An overview of the RSE program and elements of the ‘PA Counseling Center’ are depicted in figure 5.1.

The eighteen participating institutions received support to implement the program during a three-year period (i.e. a multifaceted implementation strategy). The support consisted of the following aspects:

- **Financial incentive:** every institution received a fixed amount of money every year.

- **National (n=5) and regional (n=8) meetings** with involved rehabilitation professionals of all participating institutions were organized to share knowledge and experiences throughout the program period.
- **Advisory support and visits** from national coordinators.
- **Promotion and support material:** institutions received a wide range of different materials to promote the 'PA Counseling Center' (e.g. posters, banners) and to facilitate the implementation process (e.g. a Handbook with guidelines).
- **Training in MI:** all counselors received a three-day training course in MI by a certified MI trainer including several refresh training sessions.
- **Feedback on project plans, annual plans and annual reports:** each institution handed in a project plan, three annual plans and three annual reports to the program coordinators, who provided feedback on the documents.

A detailed description of the content of the RSE program and the implementation strategy can be found elsewhere [24,25].

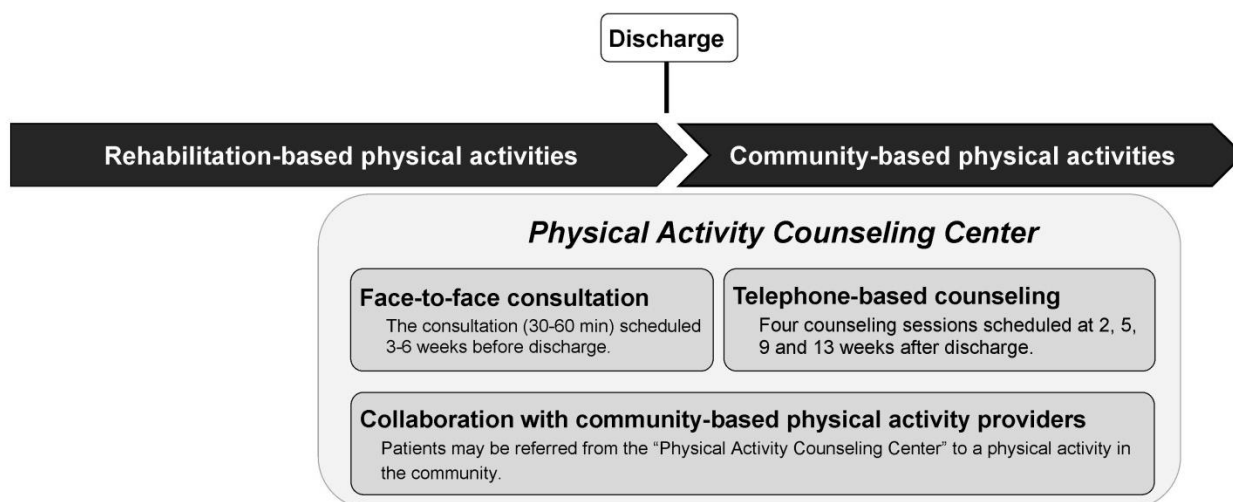


Figure 5.1

The elements of the “PA Counseling Center” as part of the implementation of the Rehabilitation, Sport and Exercise program.

Setting and study population

Twelve rehabilitation centers and six rehabilitation departments of hospitals were selected to participate in this study. Before the implementation process started, participating institutions declared that they were willing to implement and continue the RSE program in their institution.

Two national coordinators developed and executed the implementation of the RSE program in Dutch rehabilitation care following the work of van der Ploeg *et al.* [11]. Logs from the national coordinators were used to obtain information about the implementation process on a national level. Rehabilitation professionals (managers, physicians, project leaders, counselors) in each of the eighteen rehabilitation institutions provided information about the implementation of the ‘PA Counseling Center’ on an institutional level. Information on patient level was obtained via logs

from counselors registered in a custom-made online system and by survey forms filled in by patients who gave informed consent to take part in the ReSpAct-study [25]. When no information (i.e. “missing data”) about a session was registered in the system by the counsellors, we assumed that this session did not take place.

Process outcomes

Table 5.1 presents an overview of the descriptions of the process outcomes on different levels (institutional and patient) and the corresponding measurement-instruments (logbooks, online registration system, surveys).

Table 5.1

Description of the process outcomes

Process outcomes	Description	Measuring instruments
Reach	Institutional level - Number of locations with an active PA Counseling Center - Number of professionals involved in the implementation process	RS
	Patient level - Total number of patients participated in the RSE program	RS
Dosage	Patient level - Percentage of patients that received a referral to a community-based sport or PA during the face-to-face consultation at the 'PA Counseling Center'* - Number of counseling sessions received by patients (phone and email contact)*	RS
Satisfaction	Institutional level - Professionals' opinion about activities related to implementation strategy - Professionals' opinion about the RSE program	QS
	Patient level - Patients' opinion about the received face-to-face consultation and counseling from the counselor of the 'PA Counseling Center'	QSp (t0+t1)
Maintenance	Institutional level - The number of institutions that became a paid member of the RSE program after the program period** - Number of locations with an official 'PA Counseling Center' five months after program period	LB

Note. Description of the process outcomes are based on definitions by [22,23]. * Dosage outcome is assessed among patients that are enrolled in the ReSpAct-study. ** Institutions that became paid member of RSE program officially declared that they would continue the 'PA Counseling Center' after the program period. Official 'PA Counseling Centers' should be a paid member of the RSE program. PA = Physical activity, LB=Logbook by national coordinators; RS = Registration system, QS=Questionnaires from professionals at three time points (T0, T1, T2). QSp = Questionnaires from patients at two time points (t0, t1).

Reach

On institutional and patient level, the 'reach' comprised the number of locations, professionals and patients involved in the implementation of the RSE program using a custom-made online registration system. The development of this registration system allowed us to collect anonymous data on the number and type of patients that received support via one of the 'PA Counseling Centers'. Counselors were instructed to complete an online record after each face-to-face consultation, which included information about patient's characteristics (gender, year of birth, disability or disease, rehabilitation treatment). Registrations took place between April 2013 and December 2015.

The number of patients participating in the RSE program was calculated per institution and clustered for each half year of the program period. This resulted in five periods (period 1: July-December 2013, period 2: Jan – June 2014, period 3: July – Dec 2014, period 4: Jan – June 2015, period 5: July – Dec 2015).

Dosage

On patient level, the dosage outcomes included the percentage of patients receiving a referral to a community-based sport or PA. In addition, the total number of counseling sessions received by patients was calculated using the online data of the registration system.

Satisfaction

At the institutional level, the 'satisfaction' outcome was used to gain more insight into professionals' opinion about the RSE program and the activities of the implementation strategy (e.g. meetings, training in MI) using survey data. These

surveys were conducted among rehabilitation professionals involved in the implementation of the RSE program in one of the participating institutions at three moments in time (T0: April 2013, T1: June 2015, T2: September 2015). At each time point, professionals were asked to rate the RSE program on a 10-points scale in which higher scores reflected a more positive opinion about the RSE program. The last survey (T2) included also questions about professionals' experiences with the implementation strategy.

In addition, the patients' opinion about the received face-to-face consultation and counseling sessions was assessed using survey data of patients enrolled in the ReSpAct-study. Patients were asked to rate the received face-to-face consultation (at t0) and counseling sessions (at t1) on a 10-points scale, in which a 10 indicated that patients were highly satisfied with the received guidance.

Maintenance

On institutional level, the 'maintenance' outcome provided an indication of the likelihood of continuation of the RSE program after the program period using the logbooks of the national coordinators. These logbooks included the number of institutions that became 'member' of RSE program and therefore formally committed to continue the 'PA Counseling Center' after the program period. Lastly, the national coordinators provided information about the number of 'PA Counseling Centers' five months after the end of the program period.

Profiles of received counseling

PA outcomes

Level of daily PA was assessed with an adapted version of The Short Questionnaire to Assess Health - Enhancing Physical Activity (SQUASH) [28]. The SQUASH is a self-report recall questionnaire to assess daily PA of healthy adults based on an average week in the past month. Some minor changes were made to make the SQUASH applicable for people with a physical disability [25]. The original SQUASH has proven to be reliable and valid. Two variables were calculated for our analyses; 1) total minutes of PA (continuous variable), 2) whether or not the patients participated in sports activities (yes/no). Sport activities executed as part of the rehabilitation treatment were excluded here. All available PA data were included in the multilevel analyses.

Covariates

Motivation for engaging in an active lifestyle was assessed by the Behaviour Regulation in Exercise Questionnaire (BREQ-2) [29]. The BREQ-2 consists of 19 statements on a five-point Likert scale and has demonstrated strong factorial validity in participants of exercise programs. Self-efficacy was assessed with a seven-item questionnaire based on [30,31]. Counselors registered general information (e.g. gender, age, treatment setting) about the patients in the online registration system.

Statistical analyses

Data of all process outcomes were described using appropriate descriptive statistics (e.g. means, standard deviations (SD), medians, interquartile ranges (IQR), or percentages).

Distinct profiles of received counseling were identified using latent class analyses (LCA). LCA is a recognized type of cluster analysis used to group patients in k

number of unique (otherwise observed) categories (i.e. profiles), where within each category patients are most similar regarding the received counseling and most different between identified categories. Profiles were constructed based on the following characteristics; number of telephone-based contacts, number of mail-based contacts, whether or not people were referred to an exercise activity in the community and total duration of contacts. To find the optimal number of profiles, a 1-6 class solution was modelled and multiple model fit criteria were assessed and compared according to a common procedure described elsewhere [32]. After the optimal number of profiles was chosen, each profile was labelled according to salient characteristics of which detailed information are reported in the appendix.

Finally, multilevel analyses were conducted to analyze differences between profile membership and changes in PA outcomes during and after rehabilitation. A three-level model was used in which time (level 1) was clustered within patients (level 2) and patients were clustered within institutions (level 3). The largest profile was used as the reference category. Possible interactions between profile membership and time were investigated first to assess differences in changes in PA outcomes over time between the profiles. The crude models included the profile membership dummy variables and interaction terms. The adjusted models included covariates; age, gender, treatment setting (center or hospital), motivation at baseline and self-efficacy scores at baseline. Results of these analyses are presented as regression coefficients or odds ratios and corresponding 95% confidence intervals. Analyses were performed using Mplus, MLwiN version 2.36 and SPSS version 20.0 (SPSS Inc., Chicago, IL).

Results

Reach

Institutional level

At the end of the program period, 26 'PA Counseling Centers' were set up by one of the eighteen participating institutions. The number of professionals involved in the implementation process and their responses are shown in table 5.2.

Patient level

5873 Patients (92% adults) participated in the RSE program. Figure 5.2 shows the total number of patients for every half year of the program period. In fifteen of the eighteen organizations (83%) this number of patients declined in the last half year of the program period. As a result, the total number of participants was the lowest in this last period (figure 5.2).

Table 5.2

Professionals' response rates to the three surveys (T0, T1, T2).

Professionals	T0	T1	T2
Manager*	11/12 (92%)	11/15 (73%)	11/16 (69%)
Project leader + manager	6/6 (100%)	3/3 (100%)	5/5 (100%)
Project leader	9/9 (100%)	11/11 (100%)	7/7 (100%)
Project leader + counselor	4/4 (100%)	4/4 (100%)	6/6 (100%)
Counselor*	28/30 (93%)	24/30 (80%)	28/29 (97%)
Physician*	13/14 (93%)	12/16 (75%)	16/24 (67%)
Total	71/75 (96%)	65/79 (82%)	73/87 (84%)

Note. Professionals were asked to fill out a survey at three moments in time (T0: April 2013, T1: June 2015, T2: September 2015). *At T0 en T1, one counselor did not finish the survey completely. At T2, one manager and one physician did not finish the survey completely. Response rates included professionals that filled in parts of the survey.

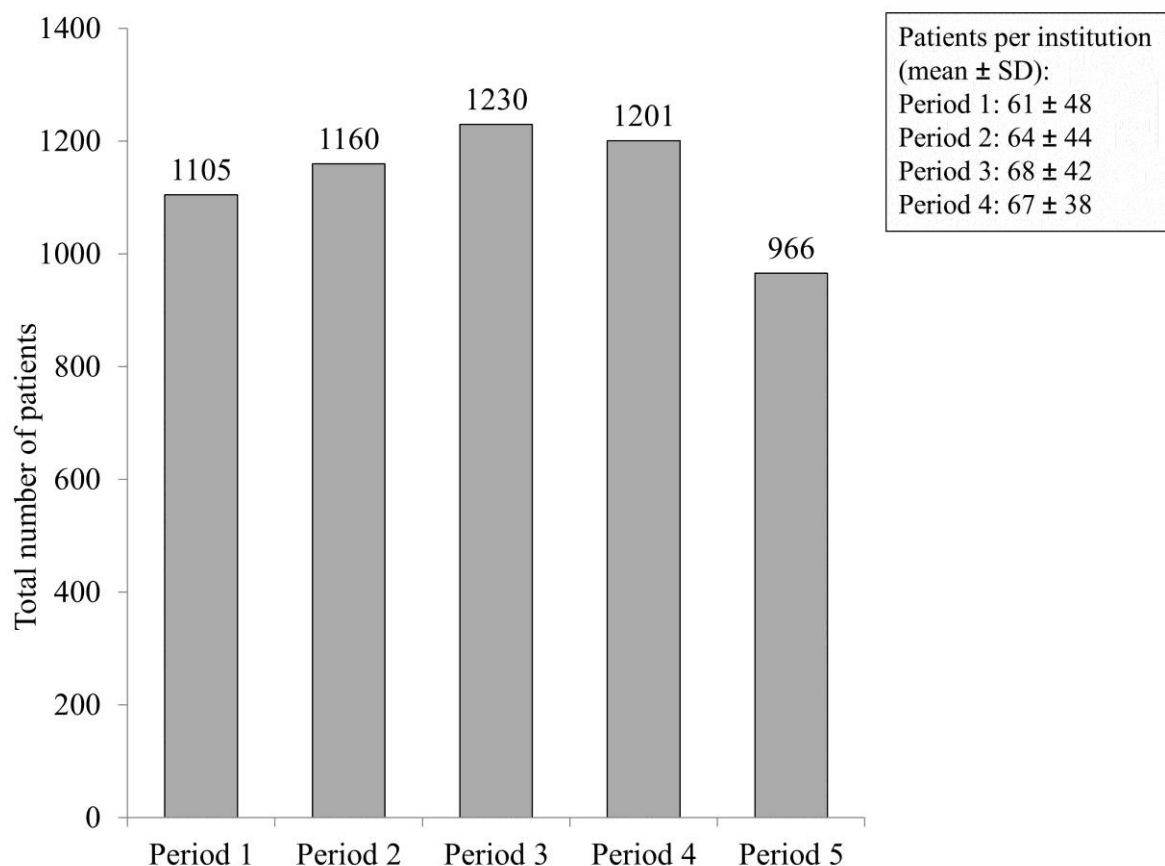


Figure 5.2

The number of patients that participated in the RSE program each half year of the program period (period 1 – 5).

Note. Mean and *SD* of the number of patients per institution ($n=18$) are depicted in the top-right box.

Dosage

Patient level

1344 Patients (78.2%) received a referral to a community-based sport or PA during the face-to-face consultation at the 'PA Counseling Center'. The total number of counseling sessions (phone and email) varied among patients (0 session: $n=240$, 14.0%; 1 – 3 sessions: $n=965$, 56.1%, 4 or more sessions: $n=514$, 29.9%). A similar

variation was found in the total number of counseling sessions that were received by phone (0 session: n=340, 19.8%; 1 – 3 sessions: n=1077, 62.6%, 4 or more sessions: n=302, 17.6%).

Satisfaction

Institutional level

At the end of the program period (T2), 45% of the professionals reported that the financial incentive was an essential factor for successful implementation. Furthermore, the training course in MI (78%) and the advisory support from national coordinators (88%) were reported to be important or essential for successful implementation (see Appendix 5.1). Other activities of the implementation strategy were mostly reported to be important, but not essential.

During the whole program period, professionals' opinion about the RSE program was positive illustrated by high mean scores on the 10-point rating scale (T0: 8.1 ± 0.7 ; T1: 8.0 ± 1.2 ; T2: 8.3 ± 0.9).

Patient level

Patients rated the received face-to-face consultation at the 'PA Counseling Center' with an 8.1 ± 1.3 (n=1319) and the counseling sessions with an 8.0 ± 1.6 (n=672). A total of 29.1% (n=306) of the patients who filled in the t1-survey reported that there was no communication with the counselors of the 'PA Counseling Centers' during the last three months and therefore this group did not rate the counseling sessions.

Maintenance

After the program period, sixteen institutions (89%) became paid member of the RSE program and therefore formally agreed to continue the 'PA Counseling Center' in their institution. Furthermore, five months after the end of the program period a total of 34 'PA Counseling Centers' were registered by national coordinators for the RSE program.

Profiles of received counseling and its association with PA outcomes

The modelling of the latent class analyses was not straightforward (Appendix 5.2). Although the Bayesian Information Criterion (BIC) pointed to at least six profiles, several posterior probabilities were below the minimally preferred value of 0.80, indicating less distinct profiles [32]. Therefore, we opted for a model with four profiles as the optimal model. The largest profile (n=841) was labelled '*low intensive counseling*'. The second-largest (n=749) was labelled '*frequent telephone counseling*'. A third profile consisted of 113 participants and was characterized as '*counseling as intended*'. Lastly, a very small profile (n=16) was labelled '*long telephone-based counseling*'.

Table 5.3

Characteristics of received counseling of the distinct profiles

	Low intensive counseling (n=841)	Frequent telephone counseling (n=749)	Counseling as intended (n=113)	Long telephone- based counseling (n=16)
Number of mail contacts:				
0	66.0	77.2	96.5	93.8
1	12.7	21.1	3.5	6.3
2	13.1	1.7	0.0	0.0
≥3	8.2	0.0	0.0	0.0
Number of telephone contacts:				
0	40.4	0.0	0.0	0.0
1	46.4	0.9	4.4	0.0
2	12.7	26.7	8.8	18.8
3	0.5	42.6	26.5	12.5
≥4	0.0	29.8	60.2	68.8
Referred to sports activity (% Yes)	78.1	80.1	66.4	75.0
Total duration of contacts (minutes, SD)	60.27 (15.90)	85.73 (15.00)	138.76 (15.47)	231.00 (32.83)

Table 5.3 describes the profiles in terms of the received counseling characteristics included in the latent class analyses. They differed markedly in the total duration of the received counseling. The two smallest profiles report intensive counseling (on average 138.76 (15.47) and 231.00 (32.83) minutes) as compared to the two larger profiles (60.27 (15.90) and 85.73 (15.00) minutes). The three largest profiles are described further in terms of personal characteristics in Appendix 5.3. No relevant differences were visible in terms of demographic and health care setting. PA outcomes (total minutes per week and sport participation) during and after

rehabilitation are visually presented in figures 5.3 and 5.4. In all profiles, the total minutes of PA decreased after rehabilitation, while the percentage of patients participating in sports increased over time.

Results of the associations between the profiles and changes in PA outcomes are presented in table 5.4. The interaction terms in the crude and adjusted models of both PA outcomes were nonsignificant, indicating that the associations between profile membership and changes in PA outcomes were not different at different time points. The crude and adjusted models showed that the average decrease in total minutes PA over time was significantly lower in the 'counseling as intended' profile compared to the 'low intensive counseling' profile (adjusted model: β -293.4, 95% CI-555.3 to -31.5). No significant differences were found between the other profiles. The sport participation outcome showed no significant differences between the profiles in both the crude as well as the adjusted models and odds ratios approached 1.00.

Table 5.4

Physical activity outcomes during (T0) and after (T1) rehabilitation presented per profile and results of the multilevel analyses

Physical activity outcomes	Descriptive		Multilevel models	
	T0	T1	Crude	Adjusted
Total minutes per week physical activity	Median (IQR)	Median (IQR)	Beta (95% CI)	Beta (95% CI)
Profiles*				
Low intensive counseling	1115 (1560)	1045.5 (1650)		
Frequent telephone counselling	990 (1410)	775 (1245)	-114.1 (-50.1 to 15.2)	-99.2 (-232.5 to 34.2)
Counseling as intended	815 (1235)	780 (1414)	-314.2 (-569.7 to -58.8)	-293.4 (-555.3 to -31.5)
Sport participation				
	Percentage (yes)	Percentage (yes)	Odds ratio (95% CI)	Odds ratio (95% CI)
Profiles*				
Low intensive counseling	55.1	62.1		
Frequent telephone counseling	57.3	66.2	1.00 (0.90 to 1.23)	0.99 (0.79 to 1.24)
Counseling as intended	60.0	64.7	0.87 (0.57 to 1.31)	0.79 (0.50 to 1.24)

Notes. *The low intensive counseling profile was used as reference c in the multilevel models. The crude models included interaction terms with time and the adjusted models included also a correction for gender, age, treatment setting, self-efficacy levels at baseline and motivation levels at baseline. Descriptive information of the physical activity outcomes were based on complete case analyses.

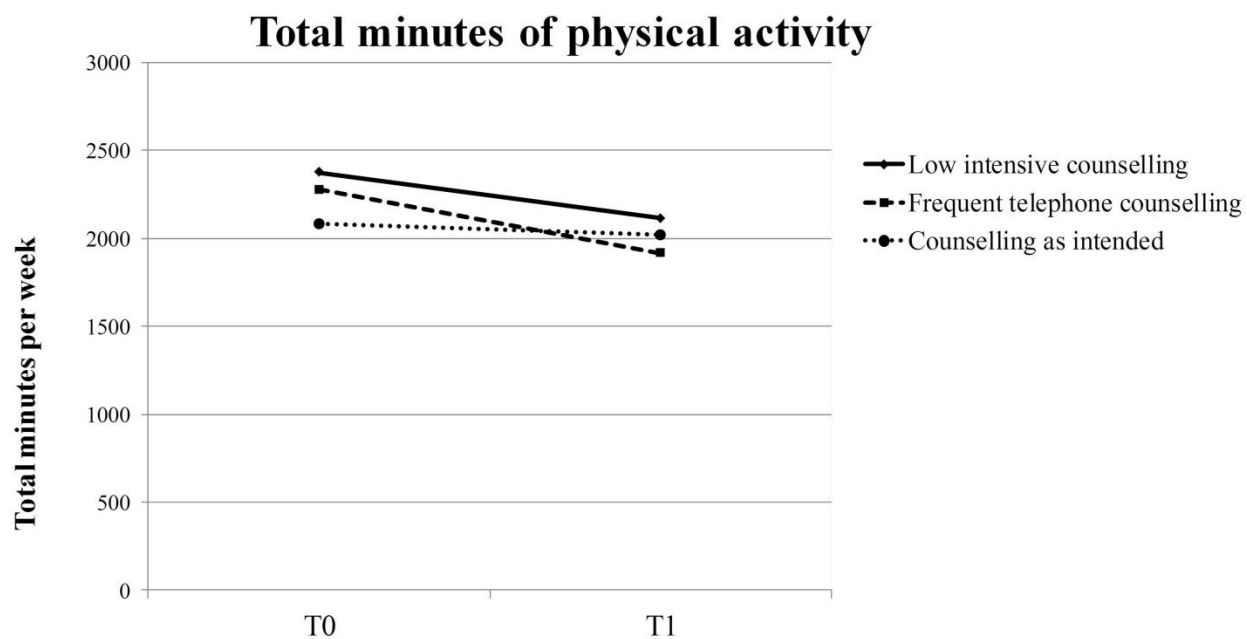


Figure 5.3

Total minutes per week of PA during (T0) and after (T1) rehabilitation presented per profile.

Note. The average minutes of PA were derived from the adjusted multilevel model.

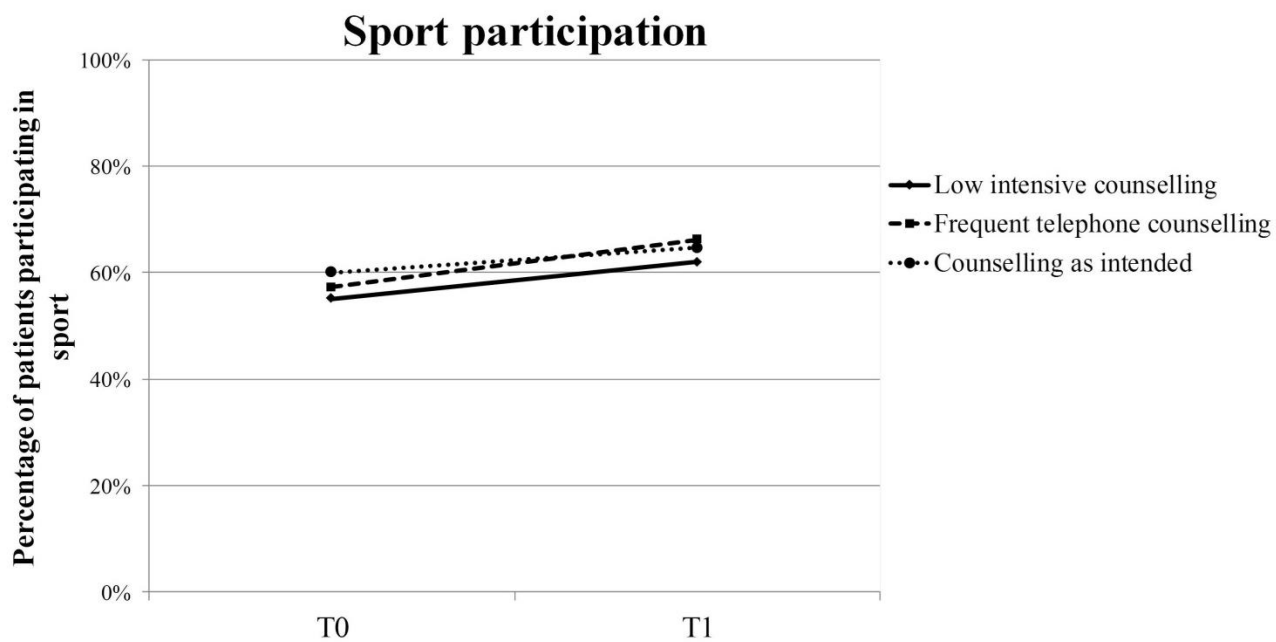


Figure 5.4

Percentages of patients participating in sport activities during (T0) and after (T1) rehabilitation presented per profile.

Note. The percentages were based on complete case analysis.

Discussion

This study demonstrated that after a three-year program period, PA counseling via 'PA Counseling Centers' was sustainably implemented in Dutch rehabilitation care. The positive experiences from both professionals and patients show that 'PA Counseling Centers' are a promising strategy in the connection of rehabilitation care and community-based PA, although consistent (short-term) improvements in PA outcomes on patient level were not (yet) demonstrated.

Reach

The number of participants (reach) and response rates to the meetings were highest halfway the program period suggesting a decline in engagement levels of professionals in the last year of the program period. The phenomenon that implementation levels decrease over time has been reported in previous evaluations on implementation processes of health promotion programs [33,34]. The decrease in implementation levels has been described to be the result of a decrease in professionals' engagement in program implementation. However, the stable high satisfaction rates of the professionals and the fact that almost all institutions were willing to continue the RSE program suggest that decreased engagement is not an issue by itself, and thus cannot explain the decreasing number of participants in the current study completely. Another explanation might be that in the last year of the program period several institutional changes occurred, such as staff turnovers (e.g. new manager or new project leader) and reorganizations. These institutional changes, illustrated as the 'implementation determinants' in the theoretical framework [18], can hamper the implementation process substantially [15,35].

Although the results showed a decrease in the number of participants, a heterogeneous group of patients received tailored support via a 'PA Counseling Center'. These findings illustrate that the 'PA Counseling Centers' are accessible for people with a variety of chronic diseases and/or physical disabilities of all ages, including adolescents. This is in line with the general idea that PA is vital for almost all disabled populations [1,36,37], which makes implementing 'PA Counseling Centers' a promising 'disability-overarching' strategy to promote an active lifestyle after rehabilitation.

Sustainability of 'PA Counseling Centers' (maintenance)

Several authors highlighted the need to not only pay attention to the implementation process of an innovation (i.e. program) in daily practice, but also to its sustainability after the implementation period [38,39]. The sustainability of the 'PA Counseling Centers' is promising and shows interesting results from both an implementation perspective as well as for rehabilitation practice. After the program period, rehabilitation institutions were provided with the opportunity to become a paid member to continue the RSE program in their institution. An interesting finding was that almost all institutions (89%) were willing to pay for the continuation, and the number of 'PA Counseling Centers' further increased. The possible reason behind this success is the intensive implementation strategy including both active (e.g. meetings, training courses) and more passive activities (e.g. financial incentives). During the three-year period, rehabilitation professionals were actively supported and motivated which gave the opportunity to experience the added value of the 'PA Counseling Center' in rehabilitation care [40]. As a result of their positive experiences, it is possible that the professionals became internally motivated to

continue the RSE program. Moreover, the national coordinators were able to create a culture in Dutch rehabilitation care in which rehabilitation professionals believe in the idea to integrate PA promotion in Dutch rehabilitation care and experienced the need to collaborate with each other on national-level. A paid membership on the RSE program in which institutions have to pay the program owners became a successful solution not only to continue the 'PA Counseling Centers', but also to continue this nationwide collaboration between rehabilitation institutions. At the same time, this gives the opportunity to monitor whether the RSE program is continued with acceptable implementation levels.

Profiles of received counseling

The received counseling was heterogeneous as illustrated by the constructed profiles. A remarkable finding is that the 'counseling as intended' profile included only 6.6% (n=113) of the patients indicating that the majority of the patients did not receive counseling according to the original protocol (i.e. four telephone-based sessions) [10,11]. Such deviations from the protocol are not uncommon in 'real-world' settings [41], since some adaptations are often made when implementing the program in different settings and under different circumstances [40]. Furthermore, studies have also highlighted the need to use individually tailored strategies in promoting PA [42] and our results are in line with these findings.

Interestingly, we were unable to demonstrate consistently large differences between received counseling profiles and changes in patients' PA levels during and immediately after rehabilitation. Our results are (partly) in contrast with a previous review suggesting that more intensive telephone-based counseling (e.g. more calls) is associated with better behavioral outcomes [43]. Although decreased PA levels

immediately after rehabilitation are somewhat disappointing in terms of the achieved program outcomes, it should be noted that the period shortly after rehabilitation is a dynamic period in a patient's life and this might explain our contradictory findings. We did see that at the first measurement occasion, almost all patients were (very) physically active as part of their rehabilitation treatment and it is not surprising that not all patients are able to maintain their (high) levels of PA at home so soon after discharge. Moreover, we did not include qualitative characteristics (e.g. MI-skills, content of sessions, counsellors-patient alliance) in the construction of the profiles. A recent study showed that both dose and content of a PA counseling program are essential elements for changing PA behavior in people with spinal cord injury [41]. The fact that we did not study elements of the content of the counseling sessions may explain why we were unable to find large differences in PA outcomes between the profiles of received counseling.

A positive finding is that a majority of the patients (78%) was referred from the 'PA counseling center' to a sports facility in the community, illustrating that a connection was established between rehabilitation care and community-based sports and PA. As a result, the percentage of patients participating in sports by themselves was increased from baseline to follow-up (55-60% to 62-65%).

Our findings suggest that the adaptations that were applied within the counseling program did not notably influence the changes in patients' PA level on the short term. In other words, similar PA outcomes were achieved regardless of the counseling protocol intensity. Moreover, decreased PA levels clearly illustrate the importance to provide patients with PA counseling *after* rehabilitation, already supported by previous studies [6,9]. A recent systematic review of review papers identified key factors influencing PA behavior in disabled populations [4]. The authors identified

factors related to different levels (intrapersonal, interpersonal, institutional, community and policy) based on a social-ecological model [44]. Although most patients were not able to maintain their high PA levels at home, the concept of establishing 'PA Counseling Centers' in rehabilitation care is for several reasons a promising approach to maintain and achieving an active lifestyle on the longer term [4]. First, the use of MI may help to overcome patient's barriers on intrapersonal (e.g. psychological factors) and interpersonal (e.g. social support) level [27]. Furthermore, the existence of 'PA Counseling Centers' in rehabilitation institutions with well-trained and skilled rehabilitation professionals address key factors on institutional (e.g. information during rehabilitation treatment, knowledge of professionals) and community level (e.g. collaborations). Although these inter-sectoral collaborations might be one of the successful elements of promoting PA in people with disabilities, it can be a challenge to establish and maintain these collaborations due to lack of time and/or differences in cultures and interests between sectors [45-47]. The counselors in the 'PA Counseling Centers' may play a promising role in overcoming these challenges and therefore creating and maintaining a sustainable network between rehabilitation and community-based PA [9,48].

Strengths and limitations

A major strength is the independent roles of the researchers in the program's evaluation. Studies have demonstrated indications that researchers who have dual roles, for example because they are also involved as program developer, program owner or are colleagues of program owners, are associated with more positive outcomes of the evaluation study compared to studies by independent researchers [49,50]. Another strength is the multicenter and longitudinal design. Institutions

situated across the whole country were involved in this study illustrating the nationwide approach resulting in a unique database of national, institutional and patient level information collected from different sources. Furthermore, this evaluation focused not only on the implementation of the program but also on its sustainability. We were even able to include data measured five months post-implementation. In addition, this multilevel study reports on the process evaluation from both the institutional level as well as the patient level.

There are also some limitations that need to be discussed. The first limitation concerns the quality of the data of the registration system that was used to assess the reach and dose. Counselors were expected to register every patient in this system. It is possible that counselors forgot to register some patients, which might have resulted in lower numbers of registered participants. However, the registration system was also developed as a tool for counselor's own administration and we have no indication that counselors selectively registered data into the system.

This study is conducted in Dutch rehabilitation care, which might be organized differently compared to other countries. In this respect, the Netherlands is a relatively small country with a high population density which might not only be a facilitating factor for nationwide collaboration between rehabilitation institutions, but also for creating and maintaining local inter-sectoral collaborations. Although this study is conducted under specific Dutch circumstances, the findings of this study may inspire other countries to establish or optimize the connection between rehabilitation care and community-based PA.

Practice implications

The concept to establish 'PA Counseling Centers' for disabled populations might not only be applicable for rehabilitation care, but is also a feasible approach for other settings, such as primary care, physiotherapy practice or community centers. For successful implementation in other settings and/or in other countries, adaptations to the PA counseling program might be necessary. For example, almost all counselors were also involved as a sport therapist or physiotherapist in patient's rehabilitation treatment indicating that they have knowledge about and experience with PA in people with disabilities. When implementing a 'PA counseling center' in other settings, special attention should be given to the knowledge and skills of the counselors [4]. It is important that they have sufficient knowledge about PA promotion in disabled populations, but they should also know which sport and exercise facilities in the community are accessible for people in disabilities. Also, these counselors should be trained in MI.

Conclusion

This study demonstrated that after a three-year program period, PA counseling after rehabilitation via 'PA Counseling Centers' was sustainably implemented in Dutch rehabilitation care. The positive experiences from professionals and patients show that establishing 'PA Counseling Centers' is a promising strategy to connect rehabilitation care and community-based PA. This study illustrated an innovative approach to assess heterogeneity in implementation outcomes (e.g. profiles of received counseling) in relation to program outcomes (e.g. PA) on the patient level. Although there was large variation in the actual received counseling, this did not

coincide with large differences in PA outcomes suggesting opportunities to further optimize tailored counseling for people with disabilities.

Declaration of interest

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Ethical considerations

The study was approved by the local ethics committee. The participating professionals and patients who are enrolled in the ReSpAct-study signed a (digital) informed consent. The study is registered by the Netherlands National Trial Registry: NTR3961.

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Appendix 5.1

Professionals' opinion on activities of the implementation strategy

<i>'To what extent were the following aspects essential for successful implementation?'</i>	Unimportant	Neutral	Important	Essential
The financial incentive	4% (2)	15% (8)	36% (20)	45% (25)
The training course in Motivational Interviewing	0	15% (8)	53% (29)	33% (18)
The advisory support from national coordinators	0	11% (6)	67% (37)	22% (12)
The materials (e.g. handbook, posters, banners)	0	20% (11)	64% (35)	16% (9)
Writing project plans, annual plans and annual reports	2% (1)	29% (16)	55% (30)	15% (8)
The regional meetings for counselors	0	27% (15)	60% (33)	13% (7)
The national meetings	0	29% (16)	60% (33)	11% (6)

Note. This question was part of the last survey (T2) filled out at the end of the program period (2015).

Appendix 5.2

Latent class analyses results

	Number of parameters	Bayesian Information Criterion	Posterior Probabilities	Number of patients per class
1 class	10	26643.719	1.00	1719
2 class	20	26035.728	0.940/0.947	1038/681
3 class	30	25657.144	0.924/0.936/0.948	730/961/28
4 class	40	25482.045	0.938/0.886/0.825/0.969	841/749/113/16
5 class	50	25416.363	0.785/0.945/0.954/0.899 /0.974	622/550/415/116/16
6 class	60	25402.416	0.715/0.772/0.886/0.949 /0.965/0.899	291/622/110/415/16/265

Appendix 5.3

Characteristics of the distinct profiles

	Low intensive counseling (n=841)	Frequent telephone counseling (n=749)	Counseling as intended (n=113)
Mean age (SD)	50.22 (0.58)	51.32 (0.56)	51.80 (1.39)
Gender (% female)	54.0	53.2	51.5
Rehabilitation treatment at baseline (%):			
Inpatient	2.3	3.6	5.3
Outpatient	89.3	90.1	92.9
Medical consultation	8.4	6.3	1.8
Diagnoses (%):			
Brain disorders (e.g. stroke)	25.7	27.4	24.8
Disorders of locomotor system	19.1	18.2	16.8
Chronic pain	17.5	16.0	12.4
Neurologic disorders	14.5	12.7	23.0
Disorders of organs	10.8	12.4	10.6
Other disorders (e.g. amputation, spinal cord injury, rheumatic diseases)	12.4	13.3	12.4
Psychosocial status at baseline			
BREQ-score*	45.83 (21.67)	47.34 (20.71)	44.69 (20.27)
Self-efficacy	41.21 (11.51)	41.63 (11.50)	40.46 (11.99)
Stage of change (%)			
(Pre)contemplation	20.1	18.9	24.3
Preparation	22.8	20.9	14.0
Action	27.4	31.9	32.7
Maintenance	29.6	28.4	29.0

Note. *The BREQ-score is a measure for motivation for engaging in an active lifestyle [29].

CHAPTER 6

Implementation fidelity trajectories of a health promotion program in multidisciplinary settings: managing tensions in rehabilitation care

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Submitted

Abstract

This study aims to generate insight into the heterogeneity of implementation fidelity trajectories of a health promotion program in multidisciplinary settings and the relationship with changes in patients' health behavior. We used longitudinal data from the nationwide implementation of an evidence-informed physical activity promotion program in Dutch rehabilitation care. Fidelity scores were calculated based on annual surveys filled in by involved professionals ($n=70$). Using hierarchical cluster analysis, three organizational-level implementation trajectories were identified: 'stable high fidelity', 'moderate and improving fidelity', and 'unstable fidelity' trajectories. Intriguingly, the trajectories were not associated with patients' self-reported physical activity outcomes ($n=622$, $p=.303$). Achieving stable high implementation fidelity required the management of tensions: realizing a change vision, while safeguarding the program's core components and engaging the scarce physicians throughout the process. When scaling up national programs to local settings, we propose to tailor the management of tensions to local organizations' starting position, size and circumstances.

Keywords

Knowledge-translation, multidisciplinary care, active lifestyle, dissemination

Background

Once a health promotion program (e.g. physical activity promotion) has shown to be effective in changing individual behavior towards a healthier lifestyle, the next step is to implement the program on a larger scale [1,2]. However, this implementation is most of the times not a straightforward process [3,4]. Implementers have been found to especially struggle with the tension between implementing a program according to the protocol (i.e. fidelity) and adapting it to the local context [5-7]. One perspective on dealing with this 'fidelity-adaptability' tension is to identify pre-defined 'core components' of the program that are needed to be implemented strictly according to the protocol while allowing a flexible implementation of the 'adaptable elements' of the program [8,9]. The assumption is that the 'core components' are necessary to achieve the desirable program outcomes on the individual level, while adaptations will account for relevant variations in local setting and in individuals.

Implementing 'core components' of a health promotion program in a multidisciplinary healthcare setting, such as rehabilitation care, can be complex due to the involvement of professionals with different specializations and the heterogeneous target population [10,11]. Consequently, the extent to which 'core components' of a multicomponent health promotion program are implemented (i.e. implementation fidelity) usually varies among organizations [12]. Moreover, implementation fidelity may also vary over time due to changes within organizations (e.g. reorganization) or changes related to involved professionals (e.g. time available to implement the program) [13-16].

Although the importance of evaluating implementation fidelity in health promotion programs is widely acknowledged [5,17], not much is known about the heterogeneity

in implementation fidelity trajectories of national health promotion programs implemented in local multidisciplinary settings. Heterogeneity in fidelity trajectories is especially expected in multidisciplinary settings (e.g. rehabilitation care), since professionals with different roles have to work together on providing and optimizing individual patient care. Identification of different trajectories obtained from different settings (e.g. centers, hospitals), may provide directions for optimization of strategies to support implementation processes, which may subsequently contribute to the improvement of health promotion activities. Moreover, it is assumed that higher implementation fidelity is associated with better program outcomes on the individual (i.e. patient) level [18]. However, it is currently unknown whether this relationship with patient outcomes also exists in organizational-level implementation fidelity trajectories measured in a multidisciplinary healthcare context.

Therefore, the aims of this study were: 1) to identify implementation fidelity trajectories of a health promotion program in a multidisciplinary setting, 2) to explore which organizational and professional characteristics are associated with these trajectories, and 3) to test whether changes in patients' health behavior are different between these trajectories.

To gain more insight into the heterogeneity of the implementation fidelity trajectories we used data from the nationwide implementation of the Rehabilitation, Sports and Exercise (RSE) program. The RSE program is a multicomponent physical activity promotion program in which 'core components' are defined based on results of a previous RCT-study [19]. This evidence-informed program has the goal to promote engagement in physical activities and sports in people with disabilities and/or chronic diseases during and after rehabilitation [20,21]. During a three-year nationwide approach, the RSE program was implemented in different rehabilitation settings

across the Netherlands. A longitudinal design was used to evaluate the implementation of the RSE program on organization- and patient-level, making it an exemplary case [22] to study implementation fidelity trajectories in a multidisciplinary setting.

New contributions

The study has theoretical and practical contributions. To the implementation fidelity literature (e.g. [17,18]), the findings are expected to add insight on the modest impact that differences in organizational-level implementation fidelity trajectories may have on ultimate patient behavior studied in complex settings (i.e. rehabilitation) and in a heterogeneous population (i.e. disabled persons). Moreover, this study offers possible explanations for the heterogeneity in implementation fidelity trajectories of a health promotion program in multidisciplinary context, in terms of tensions that are managed differently across settings. The identified implementation fidelity trajectories and the associated organizational and professional characteristics may support implementers (e.g. healthcare professionals, policymakers, managers) in making more informed implementation decisions for health promotion programs. In other words, it provides directions for what kind of assistance (i.e. implementation strategy) may be effective in different settings (e.g. large versus small organizations) when scaling up national health promotion programs to local multidisciplinary settings.

Conceptual framework

The conceptual framework described by Wierenga *et al.* [23] was used as guide for the design of the current study. This framework builds upon and integrates earlier

frameworks and models [14,24-27]. The framework includes the following ingredients:

- Three phases of an innovation processes: adoption, implementation, continuation;
- Five domains of determinants influencing the innovation process: socio-political, organization, professional, program, patient;
- The implementation strategy.

The organizations participating in our study received support to implement the RSE program during a three-year period (2013 – 2015), which we defined as the implementation phase. The continuation phase (i.e. sustainability) started after the program period (January 2016). We used Wierenga et al.'s [23] classification of the determinants (e.g. socio-political, organization, professional) for the description of the identified trajectories during the implementation phase. Based on Hoekstra *et al.* [28], we assumed that two domains of determinants, namely the organization and professional, varied the most across the participating organizations. For the purpose of the current analysis, we therefore specifically focused on variance in determinants related to the organization and the professional. Lastly, the activities initiated by the national program coordinators that were part of the implementation strategy, were mainly the same across the participating organizations and are described in the methods-section below.

Methods

Design of the study

The analyses were based on data from the Rehabilitation, Sports and Active Lifestyle (ReSpAct) study, which is a multicenter longitudinal study designed to evaluate the

RSE program [20,21]. Survey data filled in by rehabilitation professionals were used to assess implementation fidelity in seventeen organizations at three moments in time. Different methods (online registration system, surveys, logbooks, interviews) were used to collect information about organizational and professional characteristics. Patient survey data from the baseline and the first follow-up measurement were used to obtain information about the program outcomes on patient-level (changes in patients' physical activity behavior).

Setting and study population

Implementation fidelity was assessed at seventeen locations consisting of twelve rehabilitation centers and five rehabilitation departments of hospitals. Inclusion criteria for these organizations were: 1) willingness to implement and continue the RSE program, 2) willingness to support the ReSpAct-study, 3) being involved in the implementation of the RSE program during the whole program period.

The program coordinators (i.e. program owners) initiated and coordinated the implementation process in the participating organizations. Information about organizations' adoption process and implementation strategy was obtained from logbooks of the program coordinators (n=2).

Rehabilitation professionals (managers, physicians, project leaders, counsellors) provided information about the implementation process in their organization. Inclusion criteria for professionals were: 1) being actively engaged in the implementation of the RSE program, 2) working at the location of the organization that received financial incentive for implementing the program.

All adult patients participating in the RSE program were asked by the counsellors to participate also in the linked ReSpAct-study [20]. Data from participating patients

were used to investigate changes in physical activity behavior between baseline and first follow-up. Inclusion criteria were: 1) being 18 years and older, 2) having a physical disability and/or chronic disease, 3) receiving an outpatient rehabilitation treatment in one of the selected locations of the participating organizations, 4) participating in the RSE program.

The 'Rehabilitation, Sports and Exercise' program

The evidence-informed RSE program consists of six 'core components' [21]:

- 1) Patients receive an intake session with a rehabilitation professional (e.g. physician, physiotherapist) to discuss their interests in participation in sports and exercise activities during their rehabilitation treatment.
- 2) Patients take part in sports and exercise activities during rehabilitation.
- 3) Patients are referred to the Sports Counselling Centre (SCC) at the end of their rehabilitation treatment.
- 4) Patients receive tailored advice on active lifestyle during a face-to-face consultation at the SCC by using motivational interviewing (MI) to initiate a behavioral change [29].
- 5) Patients are provided with four telephone-based counselling sessions initiated by counsellors working in the SCC to further stimulate patients in maintaining an active lifestyle after rehabilitation.
- 6) The counsellors working in the SCC collaborate with sports and exercise providers in the community.

The organizations (n=17) received support to implement the RSE program in their daily routines. The support consisted of national and regional meetings for involved

professionals, advice and support from program coordinators, financial incentives, provision of promotion material and educational courses in MI.

Data measures and instruments

Implementation fidelity scores

Information about the implementation fidelity was collected by survey data. Professionals with different roles were asked to fill in a survey at three time points (T0: April 2013, T1: June 2015, T2: September 2015). The survey contained questions about the extent to which the core components of the RSE program were implemented in the organization. Completing the survey took approximately 30 to 40 minutes. Surveys were adapted to the role of the professional (manager, project leader, physician, counsellor) indicating that the survey included questions associated with the tasks of the professionals.

Implementation fidelity was measured by calculating a total fidelity score (%) for each organization at each time point (T0, T1, T2) [12]. The fidelity scores were calculated using a selection of closed-ended questions from the professionals' surveys that specially focused on the six core components of the RSE program (see table 6.1). Next, answers were dichotomized into 'yes' if the answer on the question was in line with these predefined core components. For each time point (T0, T1, T2) and for each organization (n=17), a total fidelity score was calculated by counting the number of questions dichotomized into 'yes' and dividing it by the maximum score (T0: n=12, T1: n=11, T2: n=12). Total fidelity scores are presented in percentages in which higher scores are associated with a more complete implementation of the core components of the RSE program.

Table 6.1

Core components and related items used to assess implementation fidelity

Core components and related items	Moment of measurement	Source
1) Intake session on exercise and sports		
▪ Takes place	T0, T1, T2	PL
▪ As standard component of rehabilitation*	T0, T1, T2	PL
2) Exercise and sports during rehabilitation		
▪ 'Sports and exercise during rehabilitation' is part of the official policy of the organization	T0, T2	M
▪ The topic 'sports and exercise' is discussed during a multidisciplinary team meeting**	T0, T1, T2	Ph
3) Referral to SCC		
▪ Takes place	T0, T1, T2	PL
▪ Is a standard component of rehabilitation*	T0, T1, T2	PL
4) Face-to-face consultation		
▪ Is a standard component of rehabilitation*	T0, T1, T2	PL
▪ All counsellors use MI during almost every consultation	T0, T1, T2	C
5) Counselling sessions		
▪ Takes place	T0	PL
▪ Is a standard component of rehabilitation*	T0, T1, T2	PL
▪ Takes place according to the guidelines***	T1, T2	C
6) Collaboration between SCC and external sports and exercise facilities		
▪ Collaboration between SCC and external exercise and sports facilities	T0, T1, T2	C
▪ All counsellors have knowledge of sports and exercise facilities in the region	T0, T1, T2	C

Note. *1 point if it is a standard component for (almost) all outpatients or for only some groups of outpatients, 0 point if it is not a standard component at all or I do not know. **1 point if it discussed always or most of the times, 0 point if it is discussed never or sometimes. ***1 point if all counsellors never or sometimes deviate from the guidelines, 0 point if all or some counsellors often or most of the times deviate from the guidelines.

PL = project leader, M = Manager, Ph = Physician, C = counsellor, MI = Motivational Interviewing, SCC = Sports Counselling Centre.

Professional and organizational characteristics

Information about professional (appreciation, support) and organizational characteristics (compatibility, staff turnovers, financial resources) was derived by collected data from the surveys filled in by professionals at the start (T0) and end (T2) of the program period. Questions were closed-ended, answered on a 4- or 5 Likert scale. In addition, qualitative data of interviews conducted with program coordinators (n=2) and involved professionals (managers, project leaders, counsellors) (n=28) half-way program period, were used to verify the quantitative data and identify additional relevant characteristics. See Hoekstra *et al.* [28] for details about the data collection procedures of the conducted interviews.

Patients' physical activity behavior

Information about patients' outcomes was collected by survey data from patients enrolled in the ReSpAct-study. The baseline measurement took place between three and six weeks before the end of the outpatient rehabilitation treatment and the follow-up measurement took place 14 weeks after the end of outpatient rehabilitation. Patients' physical activity behavior at baseline and follow-up were measured with the adapted version of the Short QUestionnaire to ASses Health enhancing physical activity (SQUASH) [20,30]. The original SQUASH has been shown to have an acceptable validity and test-retest reliability in health individuals and in specific patient groups [30-32]. Based on the answers of the SQUASH, a physical activity score, which is a combination of duration and intensity of all reported physical activities, was calculated for each patient at baseline and follow-up. The physical activity score included an age-related correction. The change in physical activity behavior was calculated by subtracting the physical activity score at baseline from

physical activity score at follow-up. The surveys included also questions about general demographical information, patients' psychosocial status and perceived barriers to physical activity [20].

Data analyses

Data analyses consisted of four main steps. Firstly, an agglomerative hierarchical cluster analysis based on Ward's method [33] with a squared Euclidian distance measure was conducted to gain insight into the variation of implementation fidelity trajectories. This cluster analysis was used to identify clusters of organizations with a minimum within-cluster variation and a maximum between-cluster variation in total fidelity scores at different time points. The number of clusters was decided based on the agglomeration schedule coefficient and on visual inspection of the different cluster solutions [34].

Secondly, Mann-Whitney U tests were performed to assess differences between the clusters of organizations in implementation determinants in order to externally validate the clusters and explain differences between the clusters. These determinants were related to the professionals (e.g. support, appreciation) and the organization (i.e. awareness of SCC within organization, financial resources) measured at the start (T0) and end of the program period (T2). Determinants were selected using the outcomes of a previous qualitative study on perceived facilitators and barriers to the implementation of the RSE program [28]. Determinants were selected if they were measured in the T0 and T2 surveys *and* if they had been experienced as barrier or facilitator by professionals in different organizations in the previous qualitative study [28].

Thirdly, qualitative data derived from the interviews were used to verify and interpret the quantitative data using triangulation. All interviews were recorded and transcribed as described previously [28]. For the purpose of the current study, the first author (FH) re-read and re-analyzed the transcripts using ATLAS.ti (ATLAS.ti Scientific Software Development GmbH, Berlin, Germany). The analyses were specifically focused on analyzing the differences in professional and organizational characteristics between the identified clusters. FH, who collected and analyzed the data, selected key differences and discussed the findings with MvO, who has an expertise in change management processes in multidisciplinary healthcare settings. Afterwards, the other authors, with diverse expertise (e.g. rehabilitation, physical activity promotion, sports and health, disability, epidemiology) reflected on the findings.

Lastly, linear regression analyses (crude and adjusted models) were conducted to test whether changes in patients' physical activity behavior were associated to organizational fidelity on basis of the identified clusters. The adjusted model was corrected for the following confounders: gender, stage of change at baseline, stage of change in the past, motivation, self-efficacy at baseline, number of received telephone-based counseling sessions, and the extent to which patients' disability/disease impede an active lifestyle. Confounders were chosen based on the procedure described by [35]. Statistical analyses were performed using SPSS version 20.0 (SPSS Inc., Chicago, IL). The statistical significance level was set on $p < .05$.

Results

Professionals' response rates on the T0, T1 and T2 surveys were respectively, 94%, 86%, en 88% (table 6.2). Response rates were highest for the project leaders and counsellors.

Table 6.2

Professionals' response rates to the three surveys

Professionals	T0	T1	T2
Manager	11/12 (92%)	10/13 (77%)	11/14 (79%)
Project leader + manager	6/6 (100%)	3/3 (100%)	5/5 (100%)
Project leader	9/9 (100%)	10/10 (100%)	6/6 (100%)
Project leader + counselor	4/4 (100%)	4/4 (100%)	6/6 (100%)
Counselor	26/28 (93%)	21/25 (78%)	23/23 (100%)
Physician	13/14 (93%)	11/14 (79%)	15/21 (71%)
Total	69/73 (94%)	59/69 (86%)	66/75 (88%)

Implementation fidelity trajectories

Based on the results of the hierarchical cluster analysis, three clusters of organizations (n=17) were identified: 'stable high fidelity' (n=9), 'moderate and improving fidelity' (n=6), and 'instable fidelity' (n=2). Figure 6.1 shows the total fidelity scores for each cluster over time. The 'stable high fidelity' cluster consisted of five rehabilitation centers and four rehabilitations departments of hospitals and the 'moderate and improving fidelity' cluster consisted of six rehabilitation centers. The 'instable fidelity' cluster consisted of one center and one hospital. Because of the small sample size (n=2), this cluster was not included in the next steps of analyses, in order to maintain anonymity. Mean \pm SD fidelity scores of the two largest clusters

were highest halfway program period ('stable high fidelity' cluster: T0: 68% \pm 13%, T1: 82% \pm 6%; T2: 70% \pm 9%; 'moderate and improving fidelity' cluster: T0: 35% \pm 11%, T1: 64% \pm 13%; T2: 49% \pm 10%).

Table 6.3 describes the general characteristics of the 'stable high fidelity' and 'moderate and improving fidelity' clusters. The 'stable high fidelity' cluster contained relatively smaller organizations and more early starters compared to the 'moderate and improving fidelity' cluster. Professionals' response rates to the surveys tended to be lower in the 'moderate and improving fidelity' cluster.

Appendix 6.1 describes the fidelity components at T0 and T2 for each of the two main clusters. At T0, 'stable high fidelity' organizations were more likely to execute an intake session, refer patients to the SCC, provide counselling after rehabilitation and collaborate with external sport and exercise providers. At T2, 'stable high fidelity' organizations were more likely to implement a referral to the SCC, a face-to-face consultation and counseling after rehabilitation as a standard component of the outpatient rehabilitation treatment.

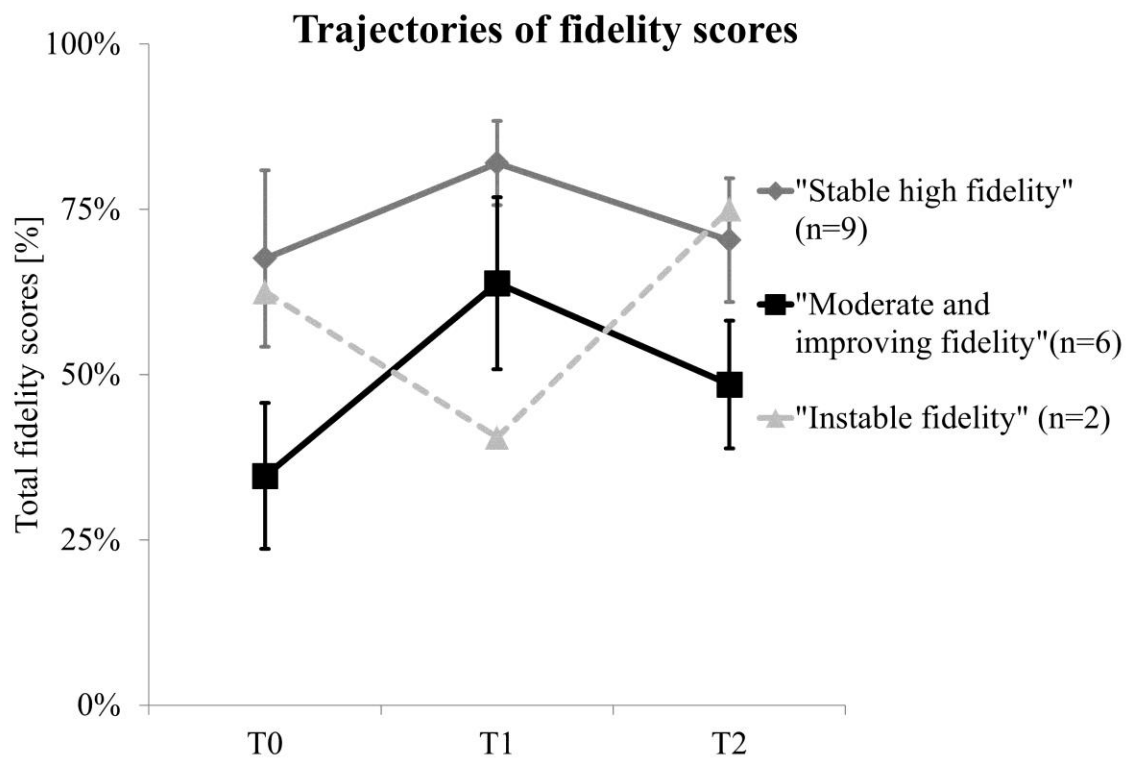


Figure 6.1

Three clusters of organizations with different implementation fidelity trajectories

Table 6.3

General characteristics of the identified clusters of organizations

General characteristics of the organizations	Cluster 1 'stable high fidelity' (n=9)	Cluster 2 'moderate and improving fidelity' (n=6)
Setting		
Center / Hospital	44.4% (4) / 55.5% (5)	100.0% (6) / 0.0% (0)
Size of organizations		
Small / Large	77.8% (7) / 22.2% (2)	33.3% (2) / 66.7% (4)
Implementation started before T0 measurement		
Yes / No	44.4% (4) / 55.6% (5)	16.7% (1) / 83.3% (5)
Professionals' response rates to surveys		
T0 (median + IQR)	100% + 7%	100% + 17%
T1 (median + IQR)	100% + 22%	78% + 29%
T2 (median + IQR)	100% + 20%	79% + 35%
Staff turnover of manager, project leader or physician		
Between T0 and T1 (% yes)	44% (4)	33% (2)
Between T1 and T2 (% yes)	44% (4)	67% (4)
Continuation of RSE program after implementation period		
Yes	88.9% (8)	83.3% (5)

Professional and organizational characteristics

Although professionals were generally positive about the implementation of the RSE program, the levels differed between both clusters (table 6.4). At the implementation period's start and end, *support from physicians and physiotherapists, professionals' appreciation, and program compatibility* were rated more positively by the professionals working in 'stable high fidelity' organizations as compared to the 'moderate and improving fidelity' organizations ($p < .05$, see table 6.4). Moreover,

managers and project leaders working in the 'stable high fidelity' organizations were more positive about the *financial resources* available to execute the RSE program as compared to those in 'moderate and improving fidelity' organizations.

Moreover, the referral procedure from patients to the SCC was significantly different between both clusters (table 6.5). Patients from 'stable high fidelity' organizations were more often referred to the SCC by rehabilitation physicians (30.5% vs 13.6%) or the multidisciplinary team (16.5% vs 0%), while patients from 'moderate and improving fidelity' organizations were more often referred by a sport therapist or physiotherapist.

As presented in table 6.6, the qualitative data confirmed the abovementioned differences between both clusters of organizations. Program coordinators reported that before the start of the program period, several physicians in the 'stable high fidelity' organizations pointed out their interests in the RSE program illustrating their proactive roles towards the implementation process. Another remarkable finding was that 'stable high fidelity' organizations had often an explicit vision and strategy about the implementation of the program in their organization. Accordingly, these professionals seem to be more creative in adapting the program to their local context (see example quotes in table 6.6).

Patients' outcomes

Patients' baseline characteristics (age, gender, diagnosis, stage of change) enrolled in the ReSpAct-study were significantly different between patients from 'stable high fidelity' and 'moderate and improving fidelity' (see table 6.5, $p < .05$). In addition, relatively more patients from the 'moderate and improving fidelity' organizations

received the complete counseling protocol (i.e. four or more sessions) compared to patients from the 'stable high fidelity' organizations (47.2% vs 19.8%, table 6.5).

The crude and adjusted regression analyses showed no significant difference in changes in physical activity scores between patients from the 'stable high fidelity' and 'moderate and improving fidelity' organizations (crude model: $\beta=-789.5$, $t(786) = -1.587$, $p=.113$; adjusted model: $\beta=-651.6$, $t(613) = -1.032$, $p=.303$).

Table 6.4

Differences between clusters in professional and organizational characteristics at the start and at the end of the implementation period

	Cluster 1 'stable high fidelity'		Cluster 2 'moderate and improving fidelity'		Differences	
	Mean (SD)	N	Mean (SD)	N	U or Z values	p- values
Start of implementation period (T0)						
Characteristics of professionals						
Support from other professionals [#]						
Management	4.2 (0.9)	37	4.3 (0.6)	24	z=-0.01	p=.994
Rehabilitation physicians	4.4 (0.6)	37	3.9 (0.5)	24	z=-2.91	p=.004*
Physiotherapists	4.5 (0.8)	37	4.0 (0.8)	25	z=-2.91	p=.004*
Sports therapists	4.8 (0.5)	30	4.7 (0.5)	25	z=-1.25	p=.210
Counsellors	4.9 (0.3)	32	4.7 (0.4)	23	z=-1.64	p=.102
Professionals' appreciation ^{##}	8.3 (0.7)	31	7.9 (0.9)	22	z=-2.61	p=.009*
Characteristics of the organization						
Compatibility of program in organization [#]	4.5 (0.6)	37	3.8 (0.9)	25	z=-2.993	p=.003*
End of implementation period (T2)						
Characteristics of professionals						
Support from other professionals [#]						
Management	4.3 (0.6)	34	3.9 (0.9)	19	z=-1.60	p=.110
Rehabilitation physicians	4.5 (0.6)	37	3.8 (0.9)	20	z=-3.20	p=.001*
Physiotherapists	4.6 (0.5)	37	3.9 (0.9)	22	z=-3.03	p=.002*
Sports therapists	4.9 (0.3)	28	4.6 (0.7)	21	z=-1.96	p=.050*
Counsellors	4.9 (0.4)	35	4.7 (0.5)	20	z=-1.39	p=.165
Professionals' appreciation ^{##}	8.5 (0.8)	37	7.9 (0.9)	22	z=-2.24	p=.025*
Characteristics of the organization						
Awareness of SCC within organization [#]	3.9 (0.8)	37	3.4 (0.9)	22	z=-1.88	p=.061
Compatibility of program in organization [#]	4.6 (0.6)	36	3.1 (1.0)	22	z=-5.19	p<.001*
Sufficient financial resources to execute the program in a satisfactory way ^{###}	4.1 (1.1)	16	3.0 (1.2)	8	U=30.5	p=.038*

Notes. [#]Measured on a Likert scale: 1=very bad to 5 = very good, ^{##}Measured on a 10-points scale, ^{###}Measured on a Likert scale: 1=strongly disagree to 5 = strongly agree, SCC=Sports Counselling Center, SD=standard deviation. Means instead of medians were presented in order to illustrate the direction of the differences.

Table 6.5

Characteristics of patients in 'stable high fidelity' and 'moderate and improving fidelity' organizations

Patients' characteristics	Cluster 1 (C1) 'stable high fidelity'	Cluster 2 (C2) 'moderate and improving fidelity'
Age* mean (SD) (C1: n=843, C2: n=415)	49.0 (13.2)	51.3 (14.0)
Gender* % (N) (C1: n=844, C2: n=417)		
Female	56.9% (480)	50.1% (209)
Diagnose* % (N) (C1:n=831, C2: n=412)		
Brain disorders (e.g. stroke)	27.6% (229)	29.1% (120)
Disorders of locomotor system	20.6% (171)	14.3% (59)
Chronic pain	19.0% (158)	15.8% (65)
Neurologic disorders	6.6% (138)	9.5% (39)
Disorders of organs	5.4% (45)	19.4% (80)
Other disorders (e.g. amputation, spinal cord injury)	10.8% (90)	11.9% (49)
Number of received counselling sessions (telephone and email)* (C1: n=844, C2: n=417)		
0 e-mails/phone calls	18.0% (152)	7.9% (33)
1 – 3 e-mails/phone calls	62.2% (525)	44.8% (187)
4 or more mails/phone calls	19.8% (167)	47.2% (197)
Referred to SCC by: * (C1:n=678, C2: n=345)		
Rehabilitation physician	30.5% (207)	13.6 (47)
Sport therapist	29.8% (202)	32.2% (111)
Physiotherapist	22.3% (151)	53.6% (185)
Multidisciplinary team	16.5% (112)	0% (0)
Other	0.9% (6)	0.6% (2)
Physical activity behavior at baseline (C1: n=755, C2: n=385) and follow up (C1: n=573, C2: n=273)		
Physical activity score at baseline (median + IQR)	3300 + 5024	3420 + 5963
Physical activity score at follow up (median + IQR)	2940 ± 4968	2958 ± 4915

Notes. Stage of change at baseline and physical activity levels are obtained from survey-data filled in by patients. Other patients' characteristics are obtained from the online registration system filled in by counselors. *Statistical significant ($p < .01$) difference between both clusters based on Chi square tests. C1 = Cluster 1, C2 = Cluster 2, SCC = Sports Counseling Centre.

Table 6.6

Key differences based on interviews with program owners and professionals

'Stable high fidelity' cluster (n=9)	'Moderate and improving fidelity' cluster (n=6)
Adoption period*	
Organization's starting position** was high (n=3), moderate (n=4) or low (n=2) <ul style="list-style-type: none"> - The organizations (n=2) with low starting positions improved within a short period 	Organization's starting position was high (n=2) or low (n=4) <ul style="list-style-type: none"> - The organizations (n=4) with low start positions improved within a moderate to long period
<i>"They [professionals in one organizations] prepared the implementation [of the program] within 3-4 weeks. This illustrates their fast improving ambition levels."</i> [Quote from a program coordinator]	<i>"It was a very difficult starting process, because of the many staff-turnovers at management level."</i> [Quote from a program coordinator].
Ambition level during adoption <ul style="list-style-type: none"> - High ambition level (n=6) - Ambition level was not discussed (n=3) 	Ambition level during adoption <ul style="list-style-type: none"> - High ambition level (n=2) - Moderate to low ambition level (n=3) - Ambition level was not discussed (n=1)
Implementation period*	
Role of physicians <ul style="list-style-type: none"> - Proactive role before the start (n=4) - Active engagement during implementation (n=9) 	Role of physicians <ul style="list-style-type: none"> - No or less active engagement before and during the implementation (n=6)
<i>"In 2011, we presented our Handbook at a national meeting organized for rehabilitation physicians. Afterwards, he [a physician of a participating organization] came to me and said 'I really want to have that Handbook, because I want to implement that program' [RSE]."</i> [Quote from a program coordinator]	<i>"It was a conscious choice. [...] At the start of the project, we were in the middle of a re-organization. And during that time, we were understaffed. And we tried to involve a physician, but it didn't worked out."</i> [Quote from a project leader and counsellor] <i>"We have to start a project, and none of the physicians had time [to be member of the work group]. [...] And that's why one of the physicians was involved from the background, as a sounding board for me. [...] But nobody participates in the work group."</i> [Quote from a project leader]
Changes in organizations <ul style="list-style-type: none"> - The impact of staff turnover processes was not explicitly discussed during interviews (n=9) - Reorganizations took place (n=1) 	Changes in organizations <ul style="list-style-type: none"> - Staff turnover processes delayed the implementation (n=2) - Reorganizations took place (n=3)
Organization's vision and strategy <ul style="list-style-type: none"> - The majority (n=8) had an explicit vision and strategy about the implementation of the program 	Organization's vision and strategy <ul style="list-style-type: none"> - The minority (n=1) had an explicit vision and strategy about the implementation of the program.
<i>"They implemented a standardized group-based intake session [of the program]. At the start of the rehabilitation treatment, all patients receive a group-based intake session about sport and exercise opportunities."</i> [Quote from a program coordinator]	<i>"Eventually, I mainly used the Handbook [of the program] to write the project plan. [...] That [Handbook] was a very useful tool."</i> [Quote from a project leader and counsellor]

Notes. *Information about the adoption period is mainly derived from the interviews with the program coordinators. Information about the implementation period is derived from interviews with the program coordinators and involved professionals (project leaders, managers and counsellors). ** Organization's starting position refers to the extent to which organizations had already implemented components of the program within their daily routines during the adoption period.

Discussion

We used a new approach to generate insight into the heterogeneity of implementation fidelity trajectories of a health promotion program in multidisciplinary setting. Moreover, we showed how these implementation fidelity trajectories were associated with changes in patients' health behavior. Our insights were based on longitudinal data of the nationwide implementation of an evidence-informed physical activity promotion program in Dutch rehabilitation care.

The implementation fidelity trajectories

The 'stable high fidelity' and 'moderate and improving fidelity' organizations showed a trajectory in which fidelity scores were highest halfway the implementation period. Since conceptualizations of implementation fidelity vary [5,36,37] and nationwide longitudinal health promotion implementation studies are relatively scarce, direct comparison with other studies is difficult. Two studies of a multicomponent health promotion program also reported decreasing implementation fidelity over time [38,39]. Another study in an educational setting, however, showed how implementation fidelity can improve over time as professionals gain experience [40]. The modest decline in implementation fidelity in our sample is in line with the diffusion of innovation theory [26], which predicts a decrease in implementation fidelity as a result of local adaptations (or 'reinventions').

Our fidelity measures related to the 'core components' of the RSE program that were assumed to be required for sustainable integration of physical activity promotion during and after rehabilitation. We had expected adaptations both within and beyond these 'core components' (e.g. mail counseling instead of or additional to telephone-

based sessions) in order to adjust to local conditions (e.g. different patient characteristics) and establish an optimal 'fit' between the program and context [8,41]. As our operationalization incorporated such adjustments, we had expected an improvement of implementation fidelity over time. Still, the majority of the organizations showed a fluctuating trajectory (i.e. increasing and decreasing fidelity scores).

We may explain these three fluctuating trajectories as follows. Achieving high fidelity for the health promotion program required engagement of professionals with different roles. Fluctuations may have occurred as a result of changes in socio-political (e.g. aborting financial incentives), organizational (e.g. staff turnovers) and professional factors (e.g. engagement levels) [41]. In our organization-level analysis, a 100% fidelity score reflects an integrated use of all program components within the rehabilitation service offering, which is assumed to make the program resilient to the aforementioned disturbances. Even though none of the organizations achieved a 100% fidelity score, almost all sustained the program. This finding supports Chamber's *et al.* [41] principle of dynamic program implementation and execution being conditional for sustainability. Durlak [42] already proposed a minimum threshold for implementation fidelity leading to effective and sustainable health promotion. Future research may gain more precise insight into variation in 'threshold' values over time for different program types and settings.

Organizational and professional characteristics

The results showed that 'stable high fidelity' organizations were generally smaller, started earlier and implemented the program in a more structured way compared to 'moderate and improving fidelity' organizations. These findings are in line with earlier

studies showing that implementation is easier in smaller organizations [14,23]. Furthermore, it was paradoxical that 'high stable fidelity' organizations showed more adaptations than 'moderate and increasing fidelity' organizations. The higher adaptation rate among 'stable high fidelity' organizations might be partly explained by the fact that these organizations adopted the program earlier in time. Simultaneously, the early start afforded the professionals in the 'stable high fidelity' organizations a longer period to implement the RSE program, resulting in generally higher fidelity scores at all time points.

Moreover, the results showed professionals' positivism and support for program implementation to be highest in 'stable high fidelity' organizations. These results accord with reviews that find professionals' attitudes, support from colleagues, and program compatibility to positively influence organization-level implementation of (health promotion) programs [13-16].

Tensions in implementing health promotion programs in multidisciplinary settings

Our analysis of the differences in organizational and professional characteristics between the 'stable high fidelity' and 'moderate and improving fidelity' trajectories, points towards three tensions that need to be managed when implementing health promotion programs in multidisciplinary settings (cf. [43,44]).

The first tension that arose concerned the dichotomy between implementing according to the nationwide evidence-informed protocol or according to the local organization's health promotion vision. The former is an implementation fidelity requirement [18], whereas the latter is a critical change management requirement [45]. Our findings demonstrate how the 'stable high fidelity' organizations had more

often an explicit own vision and strategy about the program's implementation than the 'moderate and improving fidelity' organizations. Theoretically, such a change vision supports the contextualization of an innovation, i.e. the health promotion program, which is required for its successful implementation [46]. A change vision directs the alignment of an innovation with the organization's procedures and routines, which contributes to its sustainability [41,45]. Therefore, paradoxically, 'high stable fidelity' organizations showed more adaptations than 'moderate and increasing fidelity' ones. Thus, in the first cluster, contextualization and alignment have somehow been reconciled with the guaranteeing of sufficient implementation fidelity to afford the desirable health outcomes on patient-level [5,18]. Based on these findings, we propose that determining the 'core components' of the concerning program and integrating these 'core components' within the organization's change vision helps implementers to overcome the 'fidelity-vision' tension. By showing the role of the organization's change vision in achieving high implementation fidelity, the 'fidelity-vision' tension extends earlier research on the 'fidelity-adaptability' tension [5,6,17,47].

The second tension we came across was the balancing between physicians' active engagement and management's buffering of scarce physician resources. On the one hand, engagement of the most influential professionals, i.e. physicians, helps implementation and sustenance [45,48]. On the other hand, the active involvement of different professionals (e.g. physician, physical therapists, sports counselors) is time intensive and costly. Our study adds to this literature, by our results' suggestion that the balancing largely depended on the organization's size. In small organizations, which were more represented in the 'stable high fidelity' cluster, active engagement of physicians was found and seems to have positively contributed to implementation.

In contrast, in large organizations, which were more represented in the 'moderate and improving fidelity' cluster, physicians were not actively engaged. As most organizations in both clusters sustained the program after its implementation, both strategies seem feasible, yet only in different settings (large versus small sized organizations). Besides the organization's size, the current organizational circumstances seem also important for managing this tension. In the context of a reorganization, regardless of size, management's buffering of physician resources seems most feasible. Still, a balance needs to be maintained: as physician engagement coincided with 'high stable fidelity' and was found crucial for longer term sustainability [28], the extent to which the active engagement of key professionals can be traded off against their relatively scarce time and high costs remains limited.

The third tension involves the balancing between the choice for a high fidelity implementation or for a cost-efficient implementation strategy. The 'stable high fidelity' organizations feature a strategy aimed at *high fidelity implementation*, while our data suggest that the 'moderate and improving fidelity' organizations stressed *cost-efficient implementation*. Consequently, the 'moderate and improving fidelity' organizations achieved comparatively lower levels of implementation fidelity, yet these organizations showed higher continuous improvement in implementation fidelity over time. Apparently, an incremental implementation trajectory was more affordable and moderate fidelity achieved over the study's time span, did not result in lower patient outcomes than in the 'stable high fidelity' cluster. On the contrary, the routinization of the program components was lower in the 'moderate and improving fidelity' organizations suggesting less promising results regarding the sustainability of the program fidelity on the longer term. These insights are relevant for investors who want to implement and scale up their health promotion programs. They should make

decisions about how they want to invest their money and how to deal with a trade-off between quality and efficiency?

Appendix 6.2 summarizes how the three tensions relate to the different implementation fidelity trajectories. The findings illustrate how tensions are managed differently under different circumstances and settings suggesting that different strategies seem feasible in different settings (e.g. small versus large-size organizations) and circumstances (e.g. low and high starting positions). These insights are relevant when scaling up health promotion programs to local settings; it illustrates the need to apply a (more) tailored implementation strategy depending on organization's starting positions, organization's size and current organizational circumstances (e.g. reorganization).

Fidelity trajectories and patients' outcomes

The results showed no significant differences in changes in patient outcomes between the 'stable high fidelity' and 'moderate and improving fidelity' organizations. This is in contrast with the review of Durlak and DuPre [18]. A possible explanation is that the fidelity scores in our study reflect the extent to which the RSE program was integrated into the routines of the organization according to its predefined program components rather than the extent to which the program components were actually received by individual patients. Interestingly, the data showed that 'stable high fidelity' organizations achieved higher levels of routinization of the program components, which might result in differences between the clusters of organizations in health behavior outcomes of future patients, in favor of the 'stable high fidelity' organizations. Similarly, it is also possible that the lack of a difference between both clusters of organizations can be explained by the fact that we only measured physical

activity behavior in a select sample of patients reached by the RSE program. Since the 'stable high fidelity' organizations implemented the program in a more structured way, it is possible that if we had physical activity data from all outpatient rehabilitation patients treated in the organizations, patient-level outcomes might be different between 'stable high fidelity' and 'moderate and improving fidelity' organizations. Our findings clearly illustrate the complexity of conducting multisource research on organizational-level implementation fidelity trajectories and revealing its relationship with patient-level outcomes in a multidisciplinary healthcare.

Strengths and limitations

The study's major strength is its longitudinal design including multisource data (organization, professionals and patients) based on mixed methods (quantitative and qualitative). As a result, we were able to apply triangulation techniques making our findings relevant for both implementation research and practice.

The study's procedure for calculating implementation fidelity has both merits and limitations. The measurement of the total fidelity scores at the organizational level enabled the identification of variety in implementation fidelity trajectories. Clustering of the emerging trajectories enabled the exploration of associations with both the organizational and the aggregated professional- and patient-level factors, following a multiple case study logic [22].

As to the limitations, firstly, the measurement method for these fidelity scores relied on self-constructed items. Moreover, in calculating the total fidelity scores we dichotomized each item and weighed each item equally, but we have no way of knowing whether each item is equally important. Further research is necessary to gain more insight into the reliability and validity of this measurement method.

A related limitation concerns the influence of missing items on the total fidelity scores. Any missing item was conservatively counted as 'zero', which means that the observed fidelity scores may have been somewhat lower than the real scores. This conservative measure seems legitimate: to the extent that an organizations' professionals do not participate in the program's evaluation, they can be regarded as less engaged with the program.

A final limitation is that the third cluster's small sample size ($n=2$) prohibited an analysis of its characteristics. Nevertheless, the deviating fidelity trajectory in these two organizations reflects real-world phenomena that deserve further study. The steep decrease and increase in fidelity scores over time underscore the dynamic complexity of implementing programs in multidisciplinary settings.

Conclusion

This study demonstrates a new approach for gaining insight into the heterogeneity of implementation fidelity trajectories of health promotion programs in multidisciplinary settings. The organization-level implementation fidelity trajectories did not result in outcome differences at patient-level. This may suggest that an effective implementation fidelity trajectory is contingent on the local organization's conditions. More specifically, achieving stable high implementation fidelity required the management of tensions: realizing change vision, while safeguarding the program's core components and engaging the scarce physicians throughout the process. When scaling up national programs to local settings, we propose to tailor the management of tensions to local organizations' starting position, size and circumstances.

Declaration of interest

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Trial registration

This study is registered by the Netherlands National Trial Registry: NTR3961.

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Appendix 6.1

Fidelity components per cluster at the start and at the end of the implementation period

Characteristics	Cluster 1 'stable high fidelity' n=9		Cluster 2 'moderate and improving fidelity' n=6	
	yes	n/a or mv	yes	n/a or mv
Start of implementation period (T0)				
Fidelity components % (n)	yes	n/a or mv	yes	n/a or mv
1a. Intake session takes place	89% (8)	-	17% (1)	17% (1)
1b. Intake session standard component	33% (3)	-	17% (1)	17% (1)
2a. Sport and exercise is part of the official policy	44% (4)	-	50% (3)	17% (1)
2b. Discussion during multidisciplinary team	67% (6)	-	33% (2)	50% (3)
3a. Referral to SCC takes place	100% (9)	-	67% (4)	-
3b. Referral to SCC standard component	89% (8)	-	33% (2)	17% (1)
4a. Consultation at SCC takes place	78% (7)	-	83% (5)	-
4b. MI is used by all counsellors	44% (4)	-	17% (1)	-
5a. Counseling takes place	67% (6)	-	17% (1)	-
5b. Counseling as standard component	67% (6)	-	0	17% (1)
6a. Collaboration with external sport and exercise providers	78% (7)	22% (2)	17% (1)	33% (2)
6b. Network	56% (5)	33% (3)	50% (3)	50% (3)
End of implementation period (T2)				
Fidelity components % (n)	yes	n/a or mv	yes	n/a or mv
1a. Intake session takes place	78% (7)	-	67% (4)	-
1b. Intake session standard component	22% (2)	-	67% (4)	-
2a. Sport and exercise is part of the official policy	67% (6)	11% (1)	17% (1)	50% (3)
2b. Discussion during multidisciplinary team	44% (4)	22% (2)	17% (1)	33% (2)
3a. Referral to SCC takes place	100% (9)	-	67% (4)	-
3b. Referral to SCC standard component	78% (7)	-	33% (2)	17% (1)
4a. Consultation at SCC standard component	78% (7)	-	17% (1)	17% (1)
4b. MI is used by all counsellors	67% (6)	-	83% (5)	-
5a. Counseling according to the guidelines	56% (5)	22% (2)	17% (1)	33% (2)
5b. Counseling as standard component	100% (9)	-	33% (2)	-
6a. Collaboration with external sport and exercise providers	78% (7)	-	83% (5)	-
6b. Network	78% (7)	11% (1)	83% (5)	-

Note. SCC= Sports Counseling Centre, MI= Motivational Interviewing; n/a = not applicable; mv= missing value.

Appendix 6.2

Summary of identified tensions and implementation fidelity trajectories

Tensions	Cluster 1 'stable high fidelity'	Cluster 2 'moderate and improving fidelity'
1) Organization's vision and program's fidelity	Organization's vision focused - Mainly high or moderate starting positions - Generally more experienced at start	Program's fidelity focused - Mainly low starting positions
2) Active engagement of physicians and buffering physicians' engagement	Active engagement of physicians - Mainly small organizations - Mainly stable organizational circumstances	Buffering physicians' engagement - Mainly large organizations - Relatively more reorganizations
3) High fidelity and cost-efficient implementation	High fidelity implementation - Stable/linear trajectory - Mainly high or moderate starting position - Generally more experienced at start - Mainly small organizations	Cost-efficient implementation - Improving/ incremental trajectory - Mainly low starting positions - Mainly large organizations

CHAPTER 7

National approaches to promote sports and physical activity in adults with disabilities: examples from the Netherlands and Canada

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Submitted

Abstract

This study described how the Dutch and Canadian governments promote high performance sports, recreational sports and physical activity among adults with disabilities on a national level. An internet-based study was conducted to select relevant information about both governmental approaches. Both governments promote high performance sports in similar ways, but use different strategies to promote recreational sports and physical activities. The Dutch approach is characterized by using time-limited programs focusing on enhancement of sports infrastructure and inter-sector collaboration in which municipalities have key roles. The Canadian government promotes recreational sports in disabled populations by supporting programs via bilateral agreements with provinces and territories. Furthermore, the level of integration of disability sports into mainstream sport differs between countries. The findings of this study may inspire policy makers from different countries to learn from one another's policies in order to optimize national approaches to promote disability sports and physical activity on all levels.

Keywords

Active lifestyle, adapted sports, people with disabilities, policy, rehabilitation, health promotion

Introduction

People with disabilities are less physically active compared to people without disabilities [1]. Moreover, participation in organized sports activities is lower among people with disabilities. Since the (health) benefits of physical activity (PA) are well-known and widely accepted [2-4], it is important to promote PA in people with disabilities [5]. In the last decades, several countries developed PA policies aimed to increase PA levels in the general population [6,7]. In addition, the importance of developing policies to promote PA was emphasized in the Global Action Plan for the prevention of non-communicable diseases published by the World Health Organization [8]. However, such PA policy approaches are mainly focused on the general population rather than on specific target groups, such as people with disabilities.

Since people with disabilities perceive different barriers to participate in sports and PA compared to people without disabilities [9], a different approach may be needed to successfully promote PA in disabled persons on a national level. The use of a nationwide approach initiated by governmental agencies may be effective to increase PA levels in disabled populations. It is however, unknown what the most effective and successful way is, from a national level, to promote sports and PA among disabled citizens. As with PA promotion in the general population, nationwide approaches to promote PA and sports in disabled persons may differ among countries [6,7]. Identification of different approaches might give the opportunity to learn from each other and share 'good examples' of national approaches and/or elements of promoting disability sports and PA.

The Netherlands and Canada are both developed Western countries that play substantial roles in increasing knowledge about rehabilitation, clinical medicine and disability sports as illustrated by top positions in different rankings on most-cited countries and research output in these domains [10,11]. In addition, both countries had a top-10 ranking at one of the Paralympic games in the past decade (Winter 2014: 3rd and 8th; Summer 2016: 7th and 14th) suggesting that the circumstances for high performance disability sports are at least moderately good. Lastly, the Convention on the Rights of Persons with Disabilities (CRPD) was ratified by Dutch and Canadian governments indicating that both governments emphasize the importance to promote accessibility of sports and recreation for disabled populations and to create equal opportunities to do so.

Besides these similarities, substantial differences in (governmental) infrastructure can be identified among the Netherlands and Canada. For example, the Netherlands is a small country (33718 km²) in Western Europe with nearly 17 million people (population density: 512 per km²), while Canada covers a huge land mass (nearly 10 million km²) with more than 33 million people (population density: 3 per km²). Furthermore, in contrast to the Netherlands, the Canadian national government delegates much of the authority for health, education and welfare to the provinces, including generating tax revenue to support such programs. As a result, governmental approaches to promote sports and PA in disabled populations may differ among Canada and the Netherlands. The identification of similarities and differences in national approaches gives the opportunity to designate potential benefits from each approach and to further enhance national strategies for PA promotion in disabled populations. Moreover, these insights provide directions for

other countries who want to improve on their promotion of sports and PA to people with disabilities.

Therefore, the aim of this study was twofold: 1) to describe how Dutch and Canadian governments promote high performance sports, recreational sports and PA among adults with disabilities on a national level, and 2) to identify similarities and differences between these governmental approaches.

Methods

Search and classification strategy

Definitions of key terms used in our research are presented in appendix 7.1. Web-based research was conducted to identify relevant documents and websites containing information about the Dutch and Canadian approaches to promote high performance and recreational sports and PA among disabled populations. The search strategy was executed in the period between 1 May 2016 and 29 June 2016. Documents were included only if they contained information about the national approach, and applied to year 2016. If there were earlier versions of the document, only the most recent version was selected. Excluded from consideration in this study were laws or documents about sport and PA in educational settings or for children only. Relevant information and documents were identified and selected following the same procedure in both countries.

1. National-level legislation governing sport and PA and/or disability was identified via the websites of the two national governments [12,13].
2. Websites of the ministries responsible for sport and PA [14,15] were searched using the following keywords: *physical activity, exercise, sport, recreational*

sports, high performance sports, active lifestyle, disabled, people with disabilities, Paralympic, athletics, fitness. Similar keywords were used in Dutch.

3. Documents and websites were read to identify relevant information. A general web-based search using Google was conducted to capture any other relevant documents or websites.
4. All documents and websites were classified as legislation, organizations, programs and/or sport policy documents using the following definitions and criteria:
 - a. Legislation: The act should explicitly refer to “sports and/or PA” or “participation and disability”. Excluded are acts referring to promoting people with disabilities to participate in the labor market.
 - b. Organizations: The organizations should play an important role in promoting sports and PA among people with disabilities at national level. The government or non-governmental organizations must be mentioned on the website of the government or Ministry and/or in the national budget. Government organizations refer to organizations or agencies within the national bureaucracy that oversee or govern programs offered by the national government. Staff of the organization are government employees, and the chief executive of the organization reports to government. Non-governmental organizations refer to organizations or agencies outside the national bureaucracy. These organizations are included if they are mentioned on the website of the national government/Ministry *and* if they receive funding from the national government to promote sports and/or PA among disabled populations.

- c. Programs: These programs are operated by the government to facilitate and/or promote high performance sports, recreational sports and/or PA. The included programs refer explicitly to both “sports and/or PA” and “disability” and are funded by the national government. Programs were classified according to whether they focused on high performance sports, recreational sports and/or PA.
- d. Sport policy documents: This category refers to the most recent versions of written documents that describe the national sport and PA policy. In order to be included, these documents must explicitly refer to “sports and/or PA” and “disability or Paralympics”. These documents are published on the website of the national government or Ministry.

If there were uncertainties about information published on websites or documents, a person working for the concerning (non-)governmental organization was contacted by phone or e-mail to verify the information. The final descriptions of the Dutch and Canadian approach were checked respectively by an employee of Ministry of Health, Welfare and Sports and by an employee of Sport Canada.

Direct content analysis

A direct content analysis [16] was conducted to identify similarities and differences between the Dutch and Canadian approaches. For each group (legislation, organizations, programs, sport policy documents), similarities and differences were described by the first author (FH) and discussed with Canadian co-authors (LR, MMC). Afterwards, a meeting with the two Canadian policy experts (LR, MMC) and the two Dutch policy experts (FH, CvL) was undertaken to discuss the findings and to

select the most important similarities and differences. Authors (KMG,LvdW) reflected on the findings.

Results

The Dutch approach

Legislation

In the Netherlands, the Ministry of Health, Welfare and Sport is responsible for the health, PA and sports policy on a national level, enrolls programs and provides funding for health promotion, including PA promotion. The Netherlands has no statute that specifically addresses sport and PA promotion. The 'Law of the outlines of funding from Ministry of Health, Welfare and Sports' (1998) mentions that the Ministry of Health, Welfare and Sport can provide grants for activities related to sports or health promotion. This statute does not mention people with disabilities explicitly.

Furthermore, the statute 'Law of societal support' (2014) is specially focusing on participation in people with disabilities. This statute describes regulations concerning the support that municipalities have to provide to disabled persons with respect to self-reliance, participation, housing and (day)care. It is developed to compensate for additional costs associated with person's disability. Although the statute does not mention sport or PA, municipalities might reimburse sport and exercise devices that contribute to self-reliance or participation of individual level.

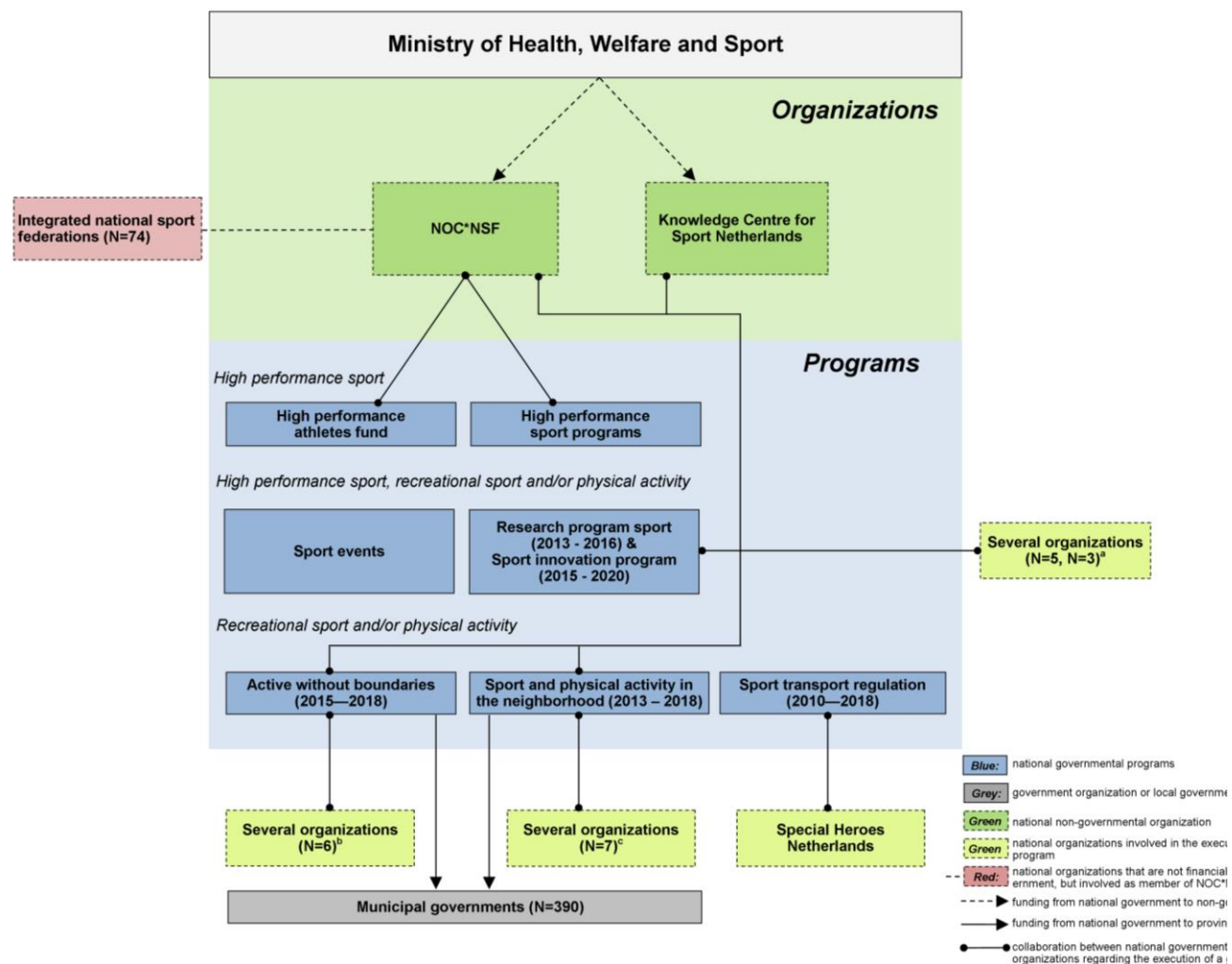
Organizations

Figure 7.1 provides an overview of the national organizations involved in promoting sport and PA among people with disabilities in the Netherlands. As depicted in figure 7.1, two national non-governmental organizations, partly funded by the Ministry of Health, Welfare and Sport, are key stakeholders:

- The “Nederlands Olympisch Comité * Nederlandse Sport Federatie” (NOC*NSF)
- Knowledge Centre for Sport Netherlands (in Dutch: Kenniscentrum Sport)

The NOC*NSF is the “*umbrella organization of sports in the Netherlands*” and promotes participation in sport and PA among Dutch (disabled) population, both on high performance and recreational level. The national sport federations who are a member of NOC*NSF (N=74), follow an integrated system in which sport federations are responsible for both mainstream and disability sports. To date, seven disability sports (boccia, bocce, goalball, id-football, wheelchair rugby, showdown, sledge-hockey) are an exception and administered by *Disability Sports Netherlands*, which is a national multisport organization and member of NOC*NSF.

The Knowledge Centre for Sport Netherlands has the mission “*to increase the impact of sports and PA through knowledge*” [17]. The involvement of this organization in the Dutch system ensures that (disability) sports policies of the national government are based on the best available knowledge and evidence.



^a Five organisations (The Netherlands Organisation for Health Research and Development, Netherlands Organisation for Scientific Research and Technology Foundation STW, NOC*NSF, SIA) are involved in the *Research program sport*. Three organizations (Netherlands Organisation for Health Research and Development, Knowledge Centre for Sport Netherlands, Topteam Sport) are involved in the *Sport innovation program*.

^b These are NOC*NSF (leader), Knowledge Centre for Sport Netherlands, National Institute for Public Health and the Environment, Provincial Sports Councils, Association of sports and municipalities, MEE Netherlands.

^c These are NOC*NSF, Knowledge Centre for Sport Netherlands, Association of sports and municipalities, Association of Dutch municipalities, The Confederation of Netherlands Industry and Employers, Royal Association MKB-Nederland, The Netherlands Organisation for Health Research and Development.

Figure 7.1

National programs and organizations involved in promoting high performance sports, recreational sports and physical activity among people with disabilities in the Netherlands

Programs

Although not officially approved by law, the Dutch government is committed to promote sports and PA and aims “*to achieve a sportive society in which there are sufficient and safe opportunities to participate in sports and PA for everybody and in which excellence in sports is stimulated*” [18]. To achieve these goals, this Ministry focuses on promoting inter-sector collaboration and knowledge sharing/development and provides funding for several programs and initiatives regarding promotion of high performance sports, recreational sports and PA. To fulfill the goal regarding stimulation of excellence in sport, the following national programs exist to support and facilitate high performance athletes with and without disabilities:

1. “High performance athletes fund”

This program provides financial support to high performance athletes with a ‘high performance’ status.

2. “High performance sports programs”

The Ministry of Health, Welfare and Sports provides funding to NOC*NSF to execute, in collaboration with sport federations, several high performance sports programs promoting and supporting high performance (disabled) athletes. Examples include the Centers for Athletes and Education and the National Athletes Centers.

3. “Sports events” (2015)

This program provides financial support for the organization of (inter)national sport events including sport events for people with disabilities. The government highlights the importance of organizing these sport events, because of its potential economic benefits and beneficial effects on recreational sports.

To fulfill the goal with regard to creating facilities for recreational sports and PA, the Ministry provides funding for the development and execution of national time-limited programs. The programs that explicitly focus on people with disabilities are:

4. “Active without boundaries” (2015 – 2018)

This program is launched by the Ministry of Health, Welfare and Sports in collaboration with several partners (see figure 7.1) and currently used as the national policy for disability sports [19,20]. The main goal of the program is to create better sports and exercise facilities in the community and making sports and PA available and accessible for all people with disabilities. Special attention is given to create sports and PA that are in line with needs and wishes of the target group (*“match between demand and supply”*). The program stimulates inter-sectoral collaboration by setting up regional partnerships on sports and disability in which different organizations (e.g. primary healthcare providers, rehabilitation centers, schools), sport and PA providers and local government agencies (e.g. municipalities, provinces) are working together.

5. “Sport and PA in the neighborhood” (2012-2018)

This program was developed to make it easier for people to adopt an active and healthy lifestyle by providing sports facilities close to home or making PA easy to combine with work or school life. The following two key instruments are used:

- Neighborhood Sports Motivators

These motivators (i.e. coaches) are appointed by municipalities to motivate people of all ages, including people with disabilities, to participate in sports and PA. The motivators are also connectors between primary care, sports and PA. Municipal governments can receive subsidy from the Ministry to appoint these motivators, but only under co-financing preconditions.

- Sport Impulse grants

Sports clubs, fitness centers or other sports providers can provide funding to set up local PA projects for inactive or low-participation subgroups, including people with disabilities [21], via the Sport Impulse grants. To apply for the grant, a collaboration between sport provider and local neighborhood partner (e.g. schools, healthcare providers, business community) is required and the use of “acknowledged interventions” (i.e. evidence-informed interventions) [22].

6. ‘Sports transport regulation’ (2010 – 2018)

Via this program, individuals with severe (physical) disability, who participate in team sports affiliated with a sport federation, can apply for a reimbursement for travel expenses for sports transportations.

Furthermore, the Ministry invests in (knowledge) innovation and knowledge sharing regarding sports and PA by the following programs:

7. Research program sport (2013 – 2016) and Sport innovation program (2015 – 2020).

The *Research program sport* aims to strengthen the scientific research on (high performance) sports and PA and to improve the transfer from science to sport practice and educational programs. The Minister stimulates the involvement of the industry in the execution of these research programs.

Sport policy documents

The Dutch Minister of Health, Welfare and Sports emphasizes the importance of disability sports and PA in several government documents and letters to the Parliament. Appendix 7.2 presents an overview of the selected documents.

The Canadian approach

Legislation

Policy governing sport in Canada is administered by the Canadian Heritage Ministry and falls under the responsibility of the Minister of Sport and Persons with Disabilities. Two statutes specifically address sport and PA:

- the National Sport Act (1994) designates hockey as the official winter sport and lacrosse as the official summer sport of Canada;
- the PA and Sport Act (2003) sets out government objectives for sport and PA in Canada; specifically to increase participation and support excellence in sport, and to build capacity in the Canadian sport system.

Neither statute mentions people with disabilities explicitly, but the latter empowers the Minister to take measures to promote PA among under-represented groups, of which people with disabilities are presumably included.

Canada does not have a single disability law at the national level, but rather has several levels of rights protections and numerous other statutes that deal with disability related issues across Ministries.

Organizations

Sport Canada is a branch of the Canadian Heritage Ministry, with a mandate to advance the sport objectives outlined in the PA and Sport Act – to promote participation, excellence and capacity building. Sport Canada fulfills its mission by administering programs itself, by transferring funds to the provinces for sports participation, and by supporting national organizations dedicated to sports. Figure 7.2

depicts an overview of national governmental and non-governmental organizations involved in promoting sports and PA among disabled Canadians.

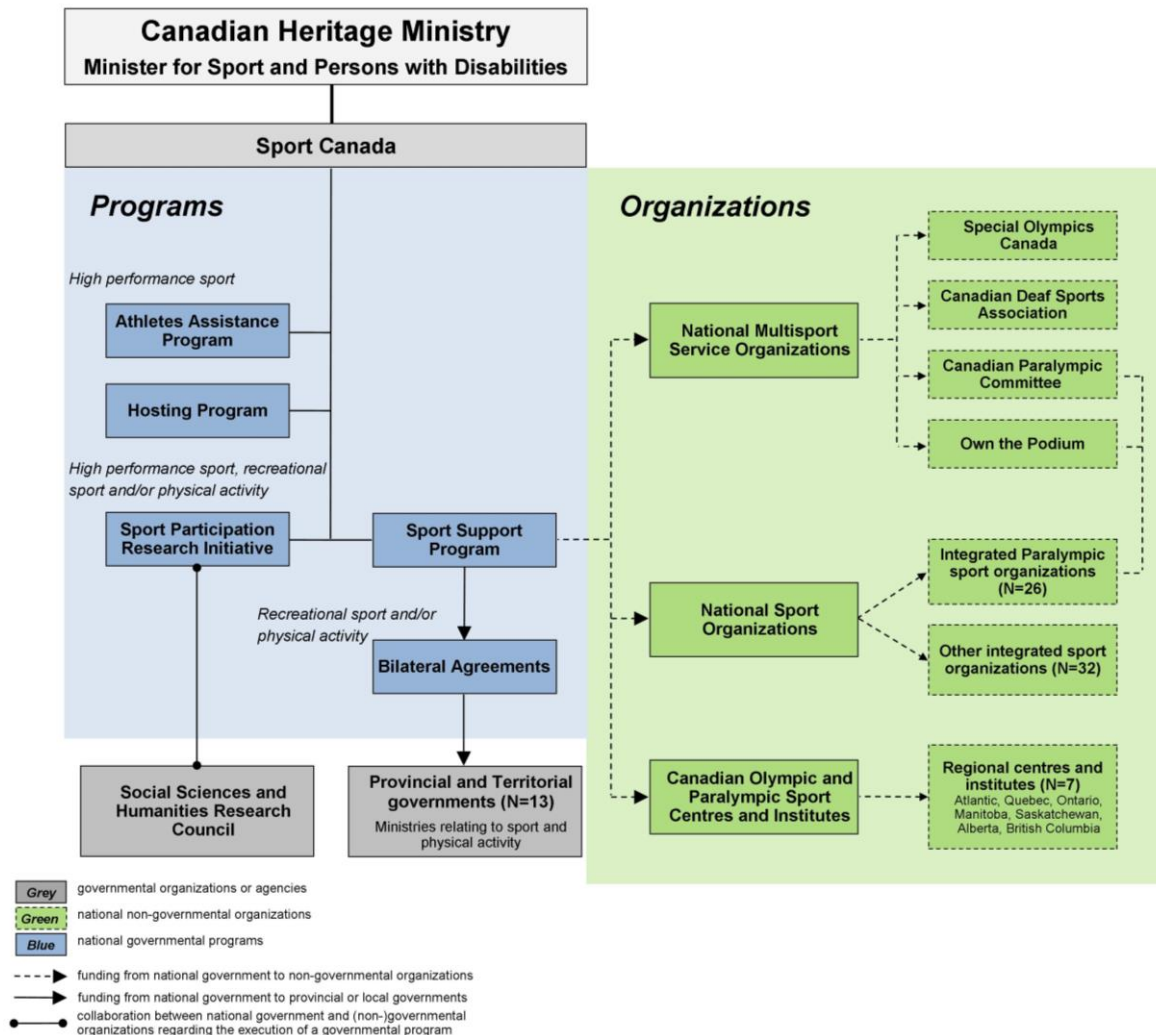


Figure 7.2

National programs and organizations involved in promoting high performance sports, recreational sports and physical activity among people with disabilities in Canada.

Programs

The Government of Canada seeks to achieve two objectives with its sports policy:

(a) to increase participation in the practice of sport and support the pursuit of

excellence in sport; and (b) to build capacity in the Canadian sport system. Sport Canada administers a number of programs in order to fulfill this mandate.

1. Sport Support Program

This program provides resources to athletes, coaches and sport facilities to enhance the potential for world-class performance by Canadian athletes, and to promote Canadian interests, values and ethics regarding sport at home and abroad. The *Sport Support Program* provides funding to approximately 88 national sport associations.

- There are 58 National Sport Associations, each governing a specific sport. Twenty-six [26] of these associations relate to sports that are performed at the Paralympic level. Sport Canada has a policy to support only one organization per sport, flowing resources to a single organization that takes an integrated approach to its sport. There are four exceptions (the Canadian Wheelchair Basketball, the Wheelchair Rugby Association, the Canadian Cerebral Palsy Sports Association [for boccia], and the Canadian Blind Sports Association [for goalball]), where no non-disabled counterpart exists at the Olympic level. The remaining 32 National Sport Associations serve disabled as well as non-disabled athletes, although they do not relate to sports that are part of the Paralympic Games.
- The *Sport Support Program* also provides funding to 23 national multi-sport associations. These include four organizations with an explicit mandate for disability sports (the Canadian Paralympic Committee, Special Olympics Canada, the Canadian Deaf Sports Association, and Own the Podium).
- Finally, the *Sport Support Program* supports seven regional Olympic and Paralympic Sport Centers / Institutes across the country. All of these, by virtue

of receiving federal government funding, must address the needs of disabled as well as non-disabled athletes, and must not discriminate against persons with disabilities.

The *Sport Support Program* also administers *Bilateral Agreements* with the thirteen provinces and territories to promote sports participation. The bilateral agreements are cost-sharing programs with the provinces and territories, with the aim of: 1) introducing young people to sports, and 2) increasing opportunities for participation in sports by under-represented groups, including people with disabilities. Consistent with its relationship to other service sectors (such as health, education and welfare), the national government delegates operational responsibility for most population-level sport programs to the provinces. Each province must match the federal contribution, and is free to express provincial and regional priorities in fulfilling the two objectives.

2. Athlete Assistance Program

This program provides direct financial assistance (living and training expenses) to qualified high-performance athletes. Funding for tuition and special needs for disabled athletes may be included in this support.

3. Hosting Program

This program supports the hosting and organization of international sporting events held in Canada (including disability sports events), and the Canada Games.

4. Sport Canada Research Initiative

The *Sport Canada Research Initiative* is a collaborative program with the Social Sciences and Humanities Research Council, to foster research regarding sport

participation and performance, explore the benefits of sport, and address needs and issues in sport in Canada.

Government sport policy documents

In addition to administering the programs outlined above, Sport Canada has a duty to communicate with Canadians about government policy regarding sports and PA. Since 2000, a number of influential documents have been produced that express the government's priorities and commitments to the area of sport and recreation. The concept of "physical literacy" is prominent in these reports, referring to knowledge, skills and attitudes around sports and PA (see Appendix 7.2).

Comparison between both approaches

Table 7.1 presents the identified similarities and differences between the Dutch and Canadian approach.

Table 7.1

Similarities and differences between the Dutch and Canadian approach

	Similarities	Differences
Legislation		<ul style="list-style-type: none"> - In contrast to NL, Canada has a sport and PA act. - Canada has a Ministry dedicated to sport and disability, while NL has a Ministry of Health, Welfare and Sports.
Organizations		<ul style="list-style-type: none"> - Canada has an organization within the bureaucracy to govern the national sport system, whereas the Dutch governing body is non-governmental.
Government organizations		
Non-governmental organizations	<ul style="list-style-type: none"> - Both countries have several national sport federations governing both mainstream sports and disability sports. 	<ul style="list-style-type: none"> - The view on the extent to which disability sports should be integrated into mainstream sports differs between countries. - In contrast to Canada, the Dutch government does not financially support disability-specific sport organizations (e.g. Special Olympics, the Deaf Sport Federations).
Programs		
HP sports	<ul style="list-style-type: none"> - Both governments support HP athletes with disabilities via several on-going programs (e.g. athletes' salary, sporting facilities). - Support and facilities for Paralympic athletes are the same for Olympic athletes. - Both governments provide funding for organization of (inter)national sport events with the potential benefits on recreational sports as one of the main reasons. 	<ul style="list-style-type: none"> - The Dutch national government outsources the development and execution of HP sport programs to a non-governmental organization (NOC*NSF).
Recreational sports and PA	<ul style="list-style-type: none"> - Both governments provide funding to local governments for sports and PA promotion among disabled populations (i.e. decentralized approach). - Both governments establish standards and commitments to the development of sport and recreational opportunities for people with disabilities. 	<ul style="list-style-type: none"> - In NL the municipalities are assigned with major responsibilities regarding PA promotion, while in Canada these responsibilities are assigned to the provincial and territorial governments. - In contrast to the Canadian bilateral agreements, the Dutch national programs are time-limited. - While the Canadian government aims to increase PA levels among citizens, the Dutch government focuses more on improving the sport infrastructure. - The Canadian bilateral agreements are broad-formulated. The Dutch programs have a specific focus on improving inter-sectoral collaboration and knowledge sharing/development. - In contrast to Canada, the Dutch government provides funding to individuals with disabilities participating in teams sports at recreational level.

<i>HP sports, recreational sports and PA</i>	- Both governments invest in research and innovation projects about (disability) sports and PA.	
Sport policy documents	<ul style="list-style-type: none"> - Both governments are committed to promote and support sports and PA among disabled populations - National governments declare an emphasis on the importance of sport for national identity - Both national ministries aim to achieve a high-ranking on Paralympic games. - Both governments aim to use best available evidence as basis for their national approaches. 	<ul style="list-style-type: none"> - Reports of the Canadian government about the role of sports and PA tend to explicitly translate general population guidelines specifically for application with disabled populations. - The Canadian system has a “Sport Funding Accountability Framework” to ensure responsible spending and outcome effectiveness. - The Canadian Ministry has specific targets on sport participation among Canadian population. - The Dutch Ministry developed their disability sports policies based on previous monitoring and evaluation reports.

HP = High performance; PA = physical activity; NL= the Netherlands

Discussion

This study showed that the Dutch and Canadian governments share similarities in the way they stimulate and invest in high performance disability sports. Moreover, major differences were identified between both countries in the way recreational sports and PA are promoted among disabled populations.

Similarities

The Netherlands and Canada are similar in that both countries invest in high performance disability sports not only to achieve high rankings in world championships (e.g. Paralympic games), but also to inspire participation in recreational sports among disabled populations. This strategy is in line with the ‘double pyramid theory’ stating that successes in high performance sports lead to increased sports participation on recreational level, and vice versa [23]. Although

scientific evidence supporting these associations in disability sports is limited, a descriptive study conducted in the Netherlands confirmed that such a two-way association was present in disability sports, although it was different between sports (individual vs team) and between men and women [24].

Differences

Some major differences were also identified in the way sports are supported by the Dutch and Canadian governments. The first difference concerns national legislation. Canada has a specific statute promoting sports and PA among Canadians, including under-represented groups. Legislation is one of the strongest policy instruments, and can be a major advantage in terms of promoting a secure and stable sport culture and infrastructure. In the Netherlands, the debate to develop a 'Sports act' has been conducted several times [25,26]. In 2004, the State Secretary of the Minister of Health, Welfare and Sports declined the development of a 'Sports act' on national level, because there was insufficient necessity to do so [26]. One of the reasons was that societal issues related to sports can be solved by using other existing laws and regulations, both on national and European level. This argument was also in line with a general wish of the Dutch Ministry to limit the number of regulations and administrative burden in the sports sector [27,28].

The second difference concerns the national governing organizations in the two countries. In Canada, sport and PA is overseen by a branch of government (Sport Canada, within the Heritage Ministry). In the Netherlands, the oversight body is a non-governmental organization (NOC*NSF). The Canadian system is more directly accountable to government, and thus a more direct reflection of government priorities. The Dutch system, by contrast, operates at one step removed from

government, and might be thus more free to make decisions in response to the authority of its own governing body.

Another difference pertains to the relationship of the national government to the many non-governmental organizations that operate the national sport system. In Canada, approximately 88 organizations have a direct relationship with the government through transfer payments from the Sport Support Program within Sport Canada. These funding arrangements are typically on-going and relatively stable.

In the Netherlands, the Ministry of Health, Welfare and Sports decided in 2003 to limit the number of subsidies to non-governmental organizations [29,30], and instead to fund time-limited national sport and PA projects. The idea is that such time-limited projects can be more directly reflect the current governmental objectives. This system is arguably a more efficient and cost-effective way of meeting objectives and targets.

A result of such an '*Impulse policy*' is that the Dutch system is very dynamic making it less predictable and/or uncertain for the field. A major challenge for investing in time-limited projects is the continuation of the program after the funding period. A 'good example' of a national evidence-informed program that received an 'impulse grant' from the Dutch government for nationwide implementation and showed successful continuation after program period, is the program 'Rehabilitation, Sports and Exercise' [31,32]. On the other hand, the Canadian system is more stable and transparent about its governmental spending.

The Dutch and Canadian approaches also differ in the way governments promote recreational sports and PA among disabled populations. In the Netherlands major responsibilities for recreational sports and PA are assigned to municipal governments via time-limited governmental programs. In Canada, the national government transfers funds to the provinces and territories through Bilateral Agreements, to

support sport programming in line with provincial priorities and in collaboration with other service sectors. Typically, municipal governments in Western countries play important roles in creating accessible sports and PA infrastructure [33-35]. Decentralization is assumed to be an effective and efficient means of administering sport programming, because it is “*closer to the citizen*” [36]. In a small country like the Netherlands, it is feasible for the national government to relate directly to municipal governments. In recent decades, the Dutch national government has delegated responsibility to the municipal governments for sports and PA among disabled populations. In a large and diverse country like Canada however, another layer of government exists between federal and municipal authorities – specifically, the provincial and territorial governments. Jurisdiction for recreational sports programming occurs at the provincial level, and municipalities are responsible to their respective provincial or territorial authorities. In both cases, municipal governments receive financial support to promote PA among disabled populations, and support sport and PA for citizens with disabilities according to local priorities.

Another difference between the Dutch and Canadian systems is the extent of national government participation in inter-sectoral collaboration in sport. Between 2008 – 2015, the Dutch Ministry of Health Welfare and Sport provided funding to implement programs in three different settings -- specialized schools, healthcare settings and rehabilitation centers -- in order to reach children with disabilities, people with intellectual disabilities and people with physical disabilities. Based on the experiences with these programs and information about the actual PA levels of Dutch citizens with disabilities, a national report, published in 2013 in commission of the Ministry, has recommended to strengthen the disability sport infrastructure by improving local collaboration [37]. As a result of this report, the current program

'Active without boundaries' was launched. This illustrates how the Dutch government tries to develop their policies based on actual knowledge and previous experiences. In line with other European countries, improving sport infrastructure, accessible facilities and activities, and educated and trained staff, have been mentioned as key challenges for disability sport [38,39].

In Canada, the national government would not typically be involved in collaborations of this nature, because service sectors, like health, education and recreation, are all governed at the provincial/territorial level. Indeed there is evidence from Canadian provinces of this type of targeted programming for disability sport, but the national government is not involved in any direct way.

Perhaps the main difference between the two countries is the extent to which they view disability sports as benefitting from being integrated with non-disabled sport, versus benefitting from having its own dedicated focus. In the Netherlands, disabled and non-disabled high performance sport is governed by one organization – the NOC*NSF. In Canada, disabled and non-disabled sport are governed by separate organizations – the Canadian Paralympic Committee and the Canadian Olympic Committee. Furthermore, the Canadian government tends to publish reports about sports and PA for general population, and then to publish a special report interpreting the policy as it relates to disabled athletes. Also, in Canada, there are several disability-specific sport organizations that continue to exist and receive federal funding, in recognition of a historical relationship with the federal government, such as the Canadian Wheelchair Basketball Association.

Like other Western countries, Canada and the Netherlands embrace a social model ideology about disability and an integrated sports system. In the last decades, both countries have changed from a focus on the individual to a focus on society, and the

extent to which it erects barriers or provides support to disabled citizens [40]. For both countries, changes in the sport system were necessary to achieve such an 'inclusive society'. In the Netherlands, the national government launched several programs to increase PA levels in disabled populations, provided money to integrate disability sports into mainstream sports and started national surveys to monitor changes in disability sport infrastructure and PA levels in disabled populations. In Canada too, significant movement has taken place to integrate single sport and multi-sport organizations and facilities.

And yet, the debate persists about the optimal level of integration to successfully promote high performance and recreational sports among disabled populations. Some authors advocate for a full integrated sport system both on high performance and recreational level, because it gives disabled athletes access to the same high-quality facilities, coaches and resources available to non-disabled athletes [40,41]. Integration of disability sports is also shown to have positive effects on sport participation levels among certain groups of disabled populations [42]. On the other hand, does the fully integrated system provide disabled athletes with what they need to compete at their optimum level? A recent systematic review on barriers and facilitators to PA among disabled populations [9] found that a lack of knowledge and skills of staff/professionals was a frequent barrier for successfully promoting PA among disabled populations. Disability-specific organizations might play a role in overcoming such barriers.

The transition towards an 'inclusive society' is not easy, because its success depends on both individual (i.e. view of life, personality) and societal factors (e.g. culture, accessibility) [43]. As illustrated by the Canadian and Dutch systems, a transition towards an 'integrated sports system' takes time. Future studies are

necessary to gain insight into the most successful and effective way to integrate disability sports into mainstream sports.

Limitations and strengths

Some limitations of our study need to be addressed. First, we only focused on national governmental approaches to promote sports among disabled populations and excluded approaches initiated outside the bureaucracy. Since there are many other national non-governmental initiatives promoting disability sports, the results of this study may not give a complete overview of all national initiatives. On the other hand, by focusing only on governmental approaches we were able to make a more straightforward comparison between the Dutch and Canadian approach.

Secondly, a web-based research strategy was used to select relevant documents and websites. Since we only selected documents published on governmental websites, it is possible that governmental websites were not up-to-date and that we missed some relevant information. However, to minimize the risk of missing relevant information, we verified uncertainties about documents or websites by persons working for the concerning (non-)governmental organization. In addition, the result-sections of the Dutch and Canadian approach were checked by governmental employees.

Thirdly, we excluded initiatives focusing only on sport and PA promotion among children with disabilities. As a result, we were not able to present the complete national approach covering all disabled populations. To further optimize national PA policy among all disabled populations, we recommend to conduct future research on the identification of cross-country differences in national approaches to promote PA among children with disabilities. Similarly, we excluded initiatives of local

governments (provinces/territories, municipalities). Since changes should be made at the local level, we strongly recommend to replicate our study but with focusing on initiatives of local governments, both between and within countries.

Besides these limitations, our study has several strengths. To our knowledge, this study is the first that described two up-to-date examples of national approaches to promote sports and PA among disabled populations, both at high performance and recreational level. We made a cross-country comparison by using similar internet-based search strategies for selecting relevant information about both countries. This study showed that by identifying differences and similarities between both approaches, good examples can be shared that may inspire other countries to pay (more) attention to disabled populations within their sports and PA policies. We hope therefore that this study may also inspire other researchers to share good examples of ways to successfully promote sports and PA among disabled populations at a national level.

Future directions

Future studies are required to investigate and understand successful and sustainable ways to promote sports and PA among disabled populations from a national level. The Para-SPLISS project is a promising example of an international collaboration aiming to evaluate sport policies on Paralympic level by developing a conceptual model including both policy and contextual factors [44,45]. Future studies are needed to expand and intensify such international collaborations in order to develop and share knowledge about effective national approaches to promote disability sports and PA on a recreational level. Developing a model or framework, such as Para-SPLISS, to identify and explore cross-country differences in recreational sports and PA levels

among disabled populations might help to understand which national approaches are successful under which circumstances. Future studies should therefore focus on developing (standardized) methods to collect data in different countries about PA policies including contextual factors and PA levels among disabled populations.

Conclusion

The Dutch and Canadian governments promote high performance disability sports via several national programs. Both countries use different approaches to promote recreational sports and PA among disabled populations which corresponds with their culture and infrastructure. The level of integration of disability sports into mainstream sport differs between countries. This study may inspire policy makers from different countries to learn from one another's policies in order to optimize national approaches to promote disabilities sports and PA on all levels. Future international collaborations are necessary to develop and share knowledge about effective and sustainable national approaches to promote recreational sports and PA among disabled populations.

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Appendix 7.1

Definitions of key terms

For this paper we used the following definitions adapted from the 'Policy on sport for persons with disability' (2006) from Sport Canada [46]:

- **High performance sport:** "Competitive sport practiced at the highest national and international levels by elite athletes that requires high degrees of physical, mental, technical and tactical preparedness, as well as experience."
- **Recreational sport:** "sport activities pursued as a pastime or leisure activity"
- **Mainstream sport:** "all organized sport activities that fall under "able-bodied" sport".

The following definition of Caspersen *et al.* [47] is used to define physical activity:

- **Physical activity:** "any bodily movement produced by the muscles that results in increased energy expenditure".

Appendix 7.2

Sports policy documents

Dutch documents	Description
Policy article 6 “Sports and Exercise” in National Budget 2016 Ministry of Health, Welfare and Sports	describes the national roles and goals of the government on sports and physical activities including corresponding financial resources provided to achieve these goals.
Policy sport events (18-03-2015)	describes that the Ministry of Health, Welfare and Sports provides funding for the organization of (inter)national sport events, which includes sport events for disabled populations.
Letter to the Parliament ‘Future sport policy’ (23-06-2016)	informs the Parliament about future plans regarding sport policy in the Netherlands. The Minister emphasizes the attention for Paralympic sports and physical activity promotion in disabled populations in future sport policy.
Letter to the Parliament ‘Disability sports’ (23-04-2015)	informs the Parliament about the new disability sports policy that is developed, namely the ‘Active without boundaries’ program.
Letter to the Parliament ‘Knowledge and innovation agenda sport’ (23-10-2014)	describes the governmental approach regarding knowledge and innovation of sports in the Netherlands and describes roles and responsibilities of involved stakeholders.
Letter to the Parliament ‘Disability sports’ on 16-10-2014	informs the Parliament about plans to develop a new policy on ‘Disability sports’.
Canadian documents	Description
Canadian Sport Policy (2012-22)	outlines Canada’s approach to sport development, including skill development, recreational sport, competitive sport, high-performance sport and sport as a tool for economic and social development.
Long-term Athlete Development (2005)	sequential model of athlete development, through seven stages from fundamental physical literacy through advanced skills and high performance. It provides guidance for design and delivery of sport programs over the lifespan.
Canadian Sport for Life (2012)	companion document to Long-term Athlete Development aimed at the general population.
No Accidental Champions (2012)	companion document to Long-term Athlete Development focusing on people with disabilities.
Federal policy for hosting international sport events (2008)	provides a framework for bidding for and hosting of international sport events.
Annual departmental performance reports	annual report on plans and priorities which include a section on sport programming. In the most recent report (2016-7), programs for people with disabilities are explicitly stated as a priority.
Policy on Sport for Persons with a Disability (2006)	framework for collaborating with stakeholders to increase accessibility and eliminate barriers to participation for Canadians with disabilities.
Sport Funding and Accountability Framework (2006)	framework to determine eligibility for funding under the Sport Support Program, and governs all programs funded by Sport Canada to ensure responsible spending and outcome effectiveness.
Framework for Participation & Excellence in Sport (2013)	describes Sport Canada’s role and priorities in amateur sport, and programs designed to achieve these goals
Sport Development Framework (2015)	outlines logic and necessary components for a sport system which enables Canadians to progress from early sport experiences to high performance excellence

CHAPTER 8

Summary, discussion and conclusion

Summary, discussion and conclusion

This thesis describes the adoption, implementation and continuation process of a physical activity promotion program (i.e. Rehabilitation, Sports and Exercise [RSE] program) in Dutch rehabilitation care. As part of the Dutch disability sport policy, the Ministry of Health, Welfare and Sports provided funding for the nationwide implementation of the RSE program in Dutch rehabilitation care. In that context, eighteen rehabilitation centers and hospitals received financial and advisory support to implement the RSE program in their daily routines. The ReSpAct research group systematically monitored and evaluated the implementation in the participating organizations during a three-year period (2013 – 2015). Figure 8.1 depicts a summarizing overview of the involved stakeholders and patients that participated in the RSE program during this period. The main findings regarding the adoption, implementation and continuation of the RSE program are described and discussed in the following sections. Moreover, this thesis provides some example of different governmental approaches to promote sports and physical activity among adults with disabilities.

“Rehabilitation, Sports and Exercise” (2013 – 2015)

Stakeholders

Government

- Ministry of Health, Welfare, and Sports (VWS)

Program owners/ coordinators

- Stichting Onbeperkt Sportief¹

Researchers

- ReSpAct research group

Rehabilitation settings

- 18 organizations received support
 - 12 rehabilitation centers
 - 6 rehabilitation departments in hospitals
- 26 “sports counselling centers”

Professionals

- ± 70 professionals were engaged in the implementation process
 - Survey response rates
 - T0 (2013): n=71/74
 - T1 (2014): n=65/79
 - T2 (2015): n=73/87
 - Professionals’ roles: managers, physicians, project leaders, counsellors

Patients

- 5873 patients participated in the RSE program
- 1719 patients participated in the ReSpAct study

Figure 8.1

An overview of the involved stakeholders and participating patients in the Rehabilitation, Sports and Exercise (RSE) program

¹ Since 2016, Stichting Onbeperkt Sportief is part of the Knowledge Center for Sport Netherlands and Stichting Special Heroes Nederland.

Summary of the main findings

The Rehabilitation, Sports and Exercise program

The RSE program is an evidence-informed approach to promote sports and daily physical activities in people with a physical disability and/or a chronic disease during and after rehabilitation. During rehabilitation, patients have the opportunity to get acquainted with different sports and physical activities. After rehabilitation, patients receive several consultations to promote a physically active lifestyle at home. All consultations are based on motivational interviewing in order to establish a behavioral change. The key components of the RSE program are:

- 1) An intake session on sports and physical activities
- 2) Sports and exercise activities during rehabilitation
- 3) A referral to the Sports Counseling Center (SCC)²
- 4) A face-to-face consultation at the SCC at the end of the rehabilitation
- 5) Telephone-based counseling sessions after rehabilitation
- 6) Collaboration between SCC and external exercise and sports facilities

The general idea was to implement these six key components of the program according to the protocol, and to make adaptations into the 'flexible elements' in order to adjust for local differences.

The adoption of the RSE program (*chapter 2 and 3*)

The RSE program was adopted by eighteen organizations consisting of twelve rehabilitation centers and six rehabilitation departments of hospitals. The recruitment

² Sports Counseling Centers (in Dutch: 'Sportloket') are also called 'Physical activity Counseling Centers' (in Dutch: 'Beweegloket'). Both terms are interchangeable.

of the organizations was performed by the program coordinators (i.e. 'Stichting Onbeperkt Sportief') following a structured selection procedure based on organization's ambition levels and geographical distribution (*chapter 2*). All participating organizations had to sign an agreement to participate including a statement that they were willing to continue the RSE program after the funding period. By signing this document, the organizations made, theoretically, the step from the adoption phase to the implementation phase.

Implementation of the RSE program

Start of the implementation (*chapter 3*)

The organizations' starting position concerning the implementation of the physical activity promotion in rehabilitation was assessed using two process outcomes (e.g. fidelity and satisfaction). Data were collected using surveys filled in by rehabilitation professionals (n=71) involved in the implementation process. The fidelity outcome showed that in most organizations sports and physical activities were, to some extent, already integrated in rehabilitation care. Physical activity promotion, though, was not always integrated as a standard component of a rehabilitation treatment. The satisfaction outcome showed that all involved rehabilitation professionals (e.g. managers, physicians, project leaders, counselors) were very positive about the physical activity promotion program (i.e. RSE program). While the fidelity outcome varied largely among organizations, the satisfaction outcome showed consistently stable results across the organizations. The findings regarding organizations' starting positions indicated the importance to focus on integrating physical activity promotion into daily routines of organizations.

Facilitating and hampering factors (*chapter 4*)

Semi-structured interviews were conducted with rehabilitation professionals (n=28) and program coordinators (n=2) to describe professionals' perceptions of factors that facilitate or hamper the implementation of a physical activity promotion program. During the implementation process, professionals perceived many different facilitating and hampering factors. Examples of commonly mentioned facilitators are: involvement of enthusiastic professionals, the agreement with organization's vision, the additional value of the program, and the possibilities to share knowledge and experiences with professionals from other organizations. Examples of commonly mentioned barriers are: the uncertainty about the continuation of the program, limited flexibility, and the lack of support from physicians and therapists to implement the program.

Process outcomes (*chapter 5 and 6*)

The implementation of the RSE program involved "sports counseling centers" that were operated to offer physical activity counseling after rehabilitation. Since tailored counseling is an essential component of the RSE program, the evaluation described in chapter 5 was specifically focused on the operation of the 'sports counseling centers' using three process outcomes (reach, dosage, and satisfaction). The fidelity outcome, on the other hand, was focused on all six aforementioned key components of the program.

Longitudinal data were collected on organization (i.e. professional) and patient level using a combination of measurement instruments (surveys, online registration system, logbooks).

Reach

At the end of the program period (December 2015), 26 “sports counseling centers” were set up by the participating organizations (n=18). About 80 professionals (physicians, managers, project leaders, counselors) were actively involved in the implementation of the program. A total of 5873 patients (92% adults) participated in the RSE program. In fifteen of the eighteen organizations (83%) the number of participants declined in the last half year of the program period.

Dosage

The dosage was assessed among patients that participated also in the ReSpAct-study (n=1719). The dosage outcome was defined as follows: 1) the percentage of patients that received a referral to a community-based sport or physical activity, and 2) the number of counseling sessions received by patients. The results showed that 1344 patients (78.2%) received a referral to a community-based sport or physical activity during the face-to-face consultation at the ‘sports counseling center’. The total number of counseling sessions (phone and email) varied substantially among patients (0 session: n=240, 14.0%; 1 – 3 sessions: n=965, 56.1%, 4 or more sessions: n=514, 29.9%).

Satisfaction

During the whole program period, professionals’ opinion about the RSE program was positively illustrated by high mean scores on the 10-point rating scale (T0: 8.1 ± 0.7; T1: 8.0 ± 1.2; T2: 8.3 ± 0.9). Similarly, patients rated the received face-to-face

consultation at the “sports counseling center” with an 8.1 ± 1.3 ($n=1319$) and the counseling sessions with an 8.0 ± 1.6 ($n=672$).

Fidelity

The fidelity outcome was defined as the extent to which the key components of the program were implemented in a structural way. *Chapter 6* provides insight into the heterogeneity of implementation fidelity over time by identifying and describing different organizational-level implementation fidelity trajectories.

Using hierarchical cluster analysis³, three trajectories were identified: ‘stable high fidelity’ ($n=9$), ‘moderate and improving fidelity’ ($n=6$), and ‘unstable fidelity’ ($n=2$) trajectories. The two largest clusters were described in terms of differences in organizational and professional characteristics. The ‘stable high fidelity’ organizations, characterized as small organizations with high starting positions, implemented the program following an explicit organization’s vision, with active engagement of physicians and with high implementation fidelity levels over time. The ‘moderate and improving fidelity’ organizations, characterized as large organizations with low starting positions, implemented the program following a strategy focusing on program’s fidelity, buffering physicians’ engagement and a cost-efficient implementation trajectory. Intriguingly, the organization-level implementation fidelity trajectories did not result in differences in patient-level outcomes (i.e. physical activity levels). This may suggest that an effective implementation fidelity trajectory is contingent on the local organization’s conditions. More specifically, achieving high implementation fidelity required the management of tensions: realizing change vision, while safeguarding the program’s core components and engaging the scarce

³ A hierarchical cluster analysis is a data analysis tool that was used to identify clusters of organizations with a minimum within-cluster variation and a maximum between-cluster variation in total fidelity scores at different time points.

physicians throughout the process. When scaling up national programs to local settings, we propose to tailor the management of tensions to local organizations' starting position, size, and circumstances.

Implementation strategy (*chapter 5 and 6*)

A multifaceted implementation strategy was used to support the implementation of the RSE program. The implementation strategy consisted of the following main components:

- Financial incentives
- National and regional meetings with involved professionals
- Advisory support and visits from national coordinators
- Promotion and support material
- Training in motivational interviewing
- Feedback on project plans, annual plans and annual reports

Professionals were in general positive about the support they received to implement the program. 45% of the professionals reported that the *financial incentive* was an essential factor for successful implementation. Furthermore, the *training course in motivational interviewing* (78%) and the *advisory support from national coordinators* (88%) were reported to be important or essential for successful implementation. In future nationwide implementation processes, we suggest to apply a more tailored implementation strategy depending on organizations' starting positions, organization size and organizational circumstances.

Profiles of received counseling and short-term physical activity outcomes

(*chapter 5*)

Latent class analyses⁴ were conducted to identify distinct profiles of received counseling characteristics (e.g. number and form of sessions). Four profiles were identified. The largest profile (n=841 patients) was labelled '*low intensive counseling*'. The second-largest (n=749) was labelled '*frequent telephone counseling*'. A third profile consisted of 113 patients and was characterized as '*counseling as intended*'. Lastly, a very small profile (n=16) was labelled '*long telephone-based counseling*'. The multilevel analyses showed no large differences between received counseling profiles and changes in patients' physical activity levels during and immediately after rehabilitation. Although there was large variation in the actual received counseling, this did not coincide with large differences in short term physical activity outcomes suggesting opportunities to further optimize tailored counseling for people with disabilities. Interestingly, the study illustrates an innovative approach to assess heterogeneity in implementation outcomes (e.g. profiles of received counseling) in relation to program outcomes (e.g. physical activity) on the patient level.

Continuation of the RSE program (chapter 3 and 5)

Maintenance

After the program period (January 2016), sixteen organizations (89%) became paid member of the RSE program and therefore formally agreed to continue the RSE program. Moreover, five months after the end of the program period a total of 34 'sports counseling centers' were registered by the national coordinators indicating a further increase of locations that implemented the RSE program.

⁴ Latent class analyses is a type of cluster analysis used to group patients in k number of unique profiles, where within each profile patients are most similar regarding the received counseling and most different between identified profiles.

Recommendations

Based on professionals' perceptions on factors affecting the continuation of the RSE program (see *chapter 3*), three recommendations were formulated to enhance (further) embedding of physical activity promotion during and after rehabilitation:

- 1) implement key components of an evidence-informed procedure and adapt this to the local multidisciplinary context;
- 2) establish a 'local ownership' by selecting committed and enthusiastic professional(s) who are responsible for the implementation and sustainability of physical activity into rehabilitation;
- 3) establish a 'national ownership' by selecting a foundation or a group of professionals that is responsible for nationwide cooperation between organizations to overcome future barriers related to the integration of physical activities into rehabilitation.

National approaches to promote disability sports (*chapter 7*)

Chapter 7 describes how the Dutch and Canadian governments promote high performance sports, recreational sports and physical activity among adults with disabilities on a national level. An internet-based study was conducted to select relevant information about both governmental approaches. Both governments promote high performance sports in similar ways, but use different strategies to promote recreational sports and physical activities. The Dutch approach is characterized by using time-limited programs focusing on enhancement of sports infrastructure and inter-sector collaboration in which municipalities have key roles. The Canadian government promotes recreational sports in disabled populations by

supporting programs via bilateral agreements with provinces and territories. Furthermore, the level of integration of disability sports into mainstream sport differs between countries. These findings may inspire policy makers from different countries to learn from one another's policies in order to optimize national approaches to promote disability sports and physical activity on all levels. Future international collaborations are necessary to develop and share knowledge about effective and sustainable national approaches to promote recreational sports and physical activity among disabled populations.

Discussion of the main findings

Successful sustainability: what are the key ingredients?

Understanding how health promotion programs (e.g. physical activity promotion) can sustain on the longer term is currently one of the key priorities in implementation science [1-5]. Our promising findings regarding the sustainability of the RSE program provide directions for bridging this literature gap. In *chapter 4* we discussed factors affecting the sustainability of a physical activity promotion program in rehabilitation. These findings were largely in line with previous literature [5-9]. But what were the *key ingredients* of the successful sustainability of the RSE program?

The first key ingredient - already discussed in the previous chapters – was the use of an intensive, well-defined, multifaceted implementation strategy (e.g. funding, training courses in motivational interviewing, meetings, materials, advisory support) addressing many different innovation determinants (e.g. finance, time, resources, knowledge and skills, motivation, culture). As a result, the professionals involved in our study were in general *highly motivated, well-trained and highly skilled* to

implement and execute the RSE program. This is in contrast with other studies reporting that a lack of professionals' knowledge and skills is a commonly perceived barrier to successful implementation [6,10-13]. In addition to that, the national and regional meetings with professionals created a strong positive 'team spirit' among professionals from different organizations, which worked as an inspiring and motivating factor for sustainable physical activity promotion in Dutch rehabilitation.

The other key ingredient for successful sustainability was the clear description of the distinct roles and responsibilities of the involved stakeholders (e.g. Ministry, program coordinators, researchers, practitioners). In our project, the Ministry provided funding for the nationwide implementation of the RSE program, the program coordinators ('Stichting Onbeperkt Sportief') prepared and coordinated the implementation process, the ReSpAct research group monitored and evaluated the process, and the rehabilitation practitioners (i.e. organizations) implemented and sustained the program in their daily routines. This clear description of roles resulted in a scaling up process of the RSE program characterized by "*good leadership, strong collaborations among stakeholders, a systematic monitoring and evaluation plan, and a well-defined implementation plan*"; all previously identified as important success factors [14].

In terms of the 'policy-practice' gap, the distinct roles of involved stakeholders are an interesting approach to discuss further. So the Dutch Ministry included the nationwide implementation of the RSE program in its disability sports policy and provided money for it, but outsourced the execution and coordination of the implementation process to a non-governmental organization (i.e. 'Stichting Onbeperkt Sportief'). In this way, the roles of both stakeholders were in line with their own expertise. And this approach, which is part of the so called 'impulse-policy' of the Dutch Ministry (*chapter 7*) seems

to work: not only the RSE program, but also the ‘Special Heroes’ program was successfully scaled up to local settings and sustained after the funded period [15].

Furthermore, the independent relationship between the program coordinators (i.e. program owners) and researchers is interesting to discuss further. An advantage of this independency was that the ReSpAct research group had no conflicts of interests in the evaluation study [16,17]. Moreover, the research group could mainly focus on the monitoring and evaluation of the program, while the program coordinators could focus on ways to sustain the program in rehabilitation practice. Consequently, this gave us, as a research group, time to think about future *research* projects, instead of how to sustain the program. Again, this illustrates how stakeholders’ roles and responsibilities were in line with their expertise and working field.

But what lessons can we learn from this approach? And how can we improve future scaling up processes? First, we recommend using a more tailored implementation strategy. The findings of this thesis suggest to apply an implementation strategy tailored on organization’s starting positions, organization’s size and current organizational circumstances (*chapter 6*). Intuitively, a more tailored approach might be more effective in addressing the determinants that are relevant in certain settings and under certain circumstances, and therefore potentially be more cost-effective. However, strong evidence that tailored implementation strategies are more effective is not (yet) available [18]. Moreover, we do not yet know how to tailor the implementation strategy in a most effective way, indicating the need to further study this approach [18,19].

Second, we recommend to work more in partnership and to make decisions more in collaborations with different stakeholders. On the one hand, the clear description of stakeholders’ roles was a successful ingredient of our approach. On the other hand,

our approach resulted in a limited involvement of practitioners and researchers in decision-making processes regarding the applied implementation strategy and sustainability of the program. Although the program coordinators used the input from rehabilitation practitioners and the reports published by the research group [20-22] to guide their decisions, the program coordinators were leading in the preparation and execution of the support activities. An approach in which decisions about the implementation plan are made in collaboration with involved stakeholders (e.g. program coordinators, practitioners, researchers) might be more effective and/or efficient due to the combination of practice-driven and theory-driven perspectives.

In sum, the intensive implementation strategy and the clear descriptions of roles and responsibilities of involved stakeholders corresponding with their own expertise were key ingredients for the successful sustainability of the RSE program. This resulted in a scaling up process of the RSE program that was characterized by good leadership, intensive collaborations on national and organization level, systematic monitoring and evaluation plan, and a well-defined implementation plan.

The RSE program: a Dutch approach or a global approach?

In fact, the RSE program is a typical Dutch program. The effectiveness of the program was previously studied in a Dutch context [23,24] and the Dutch government provided funding for the implementation of the program in Dutch rehabilitation care. And yet, successful sustainability is achieved in Dutch rehabilitation care (*this thesis*). But does this make the RSE program a Dutch approach that is only suitable for a Dutch setting? We hope not.

The Dutch roots of the RSE program should not discourage other countries to use our findings. Alternatively, the findings of this thesis can be a source of inspiration for

rehabilitation professionals and policy makers throughout the world. The need to improve the connection between rehabilitation-based physical activities and community-based physical activities is acknowledged previously by authors from other countries [25-28]. In addition, the significance of physical activity promotion is recognized by many countries [29], but examples of sustainable national approaches - focusing on disabled populations - are still limited. The strong theoretical foundation of the RSE program, demonstrated by the Physical Activity for people with a Disability (PAD) model [30] and 'stage of change' concept [31], in combination with the promising outcomes under controlled [23,24] and more 'real world' circumstances (*this thesis*), can form the basis for initiating similar counseling programs throughout the world. The strong theoretical foundation of the RSE program provides, therefore, opportunities for its broader international application.

In *chapter 5*, we revealed how the existence of 'sports counseling centers' across the country is a promising national approach to promote physical activity among disabled populations. However, when implementing 'sports counseling centers' in other countries, it should be realized that the rehabilitation care may be organized differently. In a small country like the Netherlands, patients can travel to the rehabilitation center quite easily, resulting in a relatively long period of outpatient rehabilitation. In large countries, such as Canada or USA, this might not always be possible. Therefore, patients may have to continue their outpatient rehabilitation treatment in community centers or at local physiotherapist practices. In that case, it might be more feasible to set up 'sports counseling centers' in other settings than rehabilitation centers. Fortunately, the concept of offering tailored physical activity counseling to people with disabilities is not restricted to rehabilitation care, but can also be applied in other settings, such as physiotherapist practice, primary care, and

community settings. When implementing 'sports counseling centers' in other settings, one should realize that adaptations might be necessary to account for local (infrastructural) differences. For example, implementers should think about an effective and structured way to refer patients from the rehabilitation center to the 'sport counseling setting' outside the rehabilitation center. Furthermore, implementers have to make sure that counselors working in the 'sport counseling centers' are well-trained in motivational interviewing, have experience working with people with disabilities, and have sufficient knowledge about the sports and exercise facilities in the region. When keeping these aspects in mind, the concept of setting up 'sports counseling centers' for disabled populations is broadly applicable. We hope, therefore, that our findings will be used to study the feasibility of setting up 'sports counseling centers' in different countries and under different circumstances. Several examples of similar physical activity counseling services are already reported in the literature (cf. [32-36]). And we need to continue to conduct (implementation) research on this topic in order to better understand "*what works for whom under which circumstances and in which settings*", and ultimately to help more patients to make the step from supervised physical activities in rehabilitation to self-initiated physical activities in the community.

In sum, the RSE program is yet a Dutch approach, but it has the potential and should become a global approach. This thesis describes how activities to promote sports and physical activities are integrated in Dutch rehabilitation care, and it can be used as a source of inspiration for many countries worldwide.

Patient outcomes: sports or daily physical activities?

The short term patient outcomes are contradictory: sport participation increases, but daily physical activity levels decrease (see *chapter 5*). These results may suggest that the RSE program is successful in bridging the gap between *rehabilitation-based sports* and *community-based sports*, but seems to be less successful in bridging the gap between *rehabilitation-based daily physical activities* and *community-based daily physical activities*. So how can these results be explained?

The decrease in physical activity levels seems to be disappointing, however at this moment not (yet) something to worry about. First, it should be realized that the (changes in) physical activity levels varied substantially among patients: some patients improved, others declined. Second, we have some indications that physical activity levels of patients enrolled in the ReSpAct study are relatively high. To illustrate, 66-67% of the ReSpAct population meets the Dutch physical activity guidelines⁵ versus 39-61%⁶ based on Dutch population-based data from people with a physical disability and/or chronic disease [37,38]. In addition, sport participation among ReSpAct population tends to be higher (ReSpAct: 55-64% versus 22-48%⁷ based on Dutch population-based data) [37,38]. However, we should be very careful with interpreting the results of such comparisons due to potential differences in study population (e.g. severity of disability, time since injury, age) and measurement instrument (e.g. adapted SQUASH). Third, we reported only short term outcomes, which were measured during one of the most dynamic periods in patient's life (i.e. during and immediately after rehabilitation). Once patients are in habit of their new

⁵ The Dutch physical activity guidelines (in Dutch: 'NNGB') states that people should be physically active at moderate intensity for at least 30 minutes a day on 5 or more days a week.

⁶ The percentage of people that meets the Dutch physical activity guidelines varied among subgroups: people with chronic disease (61%), people with physical disability (47%), people with physical disability and a chronic disease (39%).

⁷ The percentage of people participating in sports varied among subgroups: people with chronic disease (48%), people with physical disability (34%), people with physical disability and a chronic disease (22%).

way of living, it is possible that their physical activity levels will stabilize and/or improve again. So without insight into patients' physical activity levels on the long term (i.e. one year after rehabilitation), the decreasing short term outcomes are not (yet) something to worry about.

Alternatively, it underscores the importance to help patients in maintaining their physical activity levels after rehabilitation. But is (telephone-based) counseling the best approach? Or do we need to do something else? What we do know is that it is essential to use a tailored approach when promoting daily physical activity among people with disabilities [39]. Since the RSE program uses a patient-centered counseling style, namely motivational interviewing [40], the program is a tailored approach in itself. Moreover, the counselors were trained to use the 'stage of change' concept [31] as a guide for tailoring the counseling sessions [41]. Interestingly, this thesis in combination with our Dutch report [42] provides directions for *an even more* tailored approach based on patients' characteristics. We used a similar methodological analysis as described in chapter 5 (i.e. latent class analyses [43]) to identify distinct profiles based on patients' characteristics (e.g. motivation, stage of change, disability) during rehabilitation. A combination of patients' characteristics were chosen based on the PAD model [30]. The analyses showed three distinct patient profiles:

1) "Low motivation" profile

Patients in this profile have low motivation to engage in physical activities and are more likely to be in a low stage of change.

2) "Favorable psychosocial condition" profile

Patients in this profile have a favorable psychosocial condition, but they experienced to be often hampered by their disability/impairment to be

physically active (in other words: “*I want to sport or exercise, but I can’t do it*”).

3) “High stage of change” profile

Patients in this profile have high motivation to engage in physical activities and are more likely to be in a high stage of change.

Interestingly, changes in physical activity levels seem to be associated with the membership of these profiles: the short-term decline in daily physical activities was highest among patients in the “low motivation level” profile, and lowest among patients in the “high stage of change” profile. One can imagine that different approaches may be needed to successfully promote daily physical activity in all three profiles. For example, patients in the “low motivation level” profile may benefit the most from a (more) intensive counseling approach focusing on realizing a behavioral change. On the other hand, the “high stage of change” profile suggests possibilities for a more efficient (e.g. less intensive) counseling approach. Lastly, patients in the “favorable psychosocial condition” may benefit more from other and/or additional guidance, for example focusing on overcoming external/ environmental barriers. Obviously, future (ReSpAct) studies are needed to gain more insight about the practical application of these patients’ profiles in combination with better understanding what guidance works the best for whom.

In spite of these preliminary results, the identified patient profiles, constructed on patients’ characteristics during rehabilitation, may provide promising directions for rehabilitation practice to promote physical activity in a *more tailored* and *more efficient* way by using evidence-informed information. Such an approach has the potential to be more cost-effective due to the potential better patients’ outcomes and more efficient guidance. Moreover, it might help rehabilitation professionals and

policy makers to find the balance between guidance according to the protocol and adapting it to the wishes and needs of patients (i.e. 'fidelity – adaptability balance').

Methodological considerations

A detailed discussion of methodological considerations concerning limitations and strengths is provided in the previous chapters. The following section describes the major issues from a more general point of view.

Study design

A limitation of our study was that we did not recruit patients who did not participate in the RSE program. Therefore, we were not able to draw conclusions regarding the effectiveness of the RSE program in comparison with "usual care" (e.g. physical activity levels, cost-effectiveness). The reason that we did not choose for a traditional randomized controlled trial is obvious: the underlying goal of the project was to implement the RSE program in Dutch rehabilitation care. From that perspective, it was not desirable to create a control setting in which physical activity promotion was not part of the rehabilitation treatment. Moreover, we wanted to perform our study under relatively 'real world' conditions and we wanted to include a heterogeneous group of patients and organizations. A cohort study is then an appropriate study design. Nevertheless, our cohort design gave us the opportunity to study the heterogeneity in received counseling among groups of patients and its association with short term physical activity outcomes using an innovative approach (*chapter 5*). Future studies of the ReSpAct research group will provide insight into the underlying working mechanisms of the program (i.e. 'what works for whom the best'). A

prospective cohort study, as the ReSpAct study, seems to be suitable for answering these research questions.

Similarly, we did not study organizations that were not willing to implement the RSE program. Therefore, we were not able to identify reasons for organizations to not adopt the program. Such insights are important to further scale up the RSE program. Another limitation of our design was the fact that we did not include organizations that received no or other support from the program coordinators (i.e. different implementation strategies). Therefore, we were not able to study the effectiveness of our applied implementation strategy in comparison with a different strategy. On the other hand, based on professionals' experiences we were able to discuss essential elements of our implementation strategy (i.e. financial incentives, motivational interviewing, and advisory support). In addition, we were able to include eighteen organizations that are situated across the country and varied largely in professional and organizational characteristics.

Simultaneously, our study design is a main strength of our study. The use of a multicenter longitudinal cohort study gave us the opportunity to systematically monitor and evaluate the implementation of the RSE program by using different data sources measured simultaneously on the level of the organization and patient. In addition, the theoretical framework [44] was a helpful tool to conduct our implementation-study in a systematic and structured way. With our unique and rich dataset, we were able to relate organization level data about how the program was implemented to patient level outcomes (e.g. physical activity levels). In addition, the relatively 'real-world' nature of our design is a strong point in terms of the generalization of the current and future findings of the ReSpAct study.

Survey data

A limitation of our study is the use of survey data to gain insight into implementation fidelity, professionals' satisfaction and relevant implementation determinants. Because the surveys included self-constructed items, we had no information about its validity and reliability. In addition, the use of surveys created a serious risk of social desirable answering. In future studies on implementation determinants, we advise to use existing surveys instead of self-constructed items, such as the Measurement Instrument for Determinants of Innovations (MIDI) [45] or the Determinants of Implementation Behavior Questionnaire (DIBQ) [46]. On the other hand, our surveys were theory-based [6,47] and constructed in collaboration with the research group and program coordinators. Moreover, we used different data sources (surveys, registration system, interviews) in order to verify and enrich our findings. In addition, we enrolled professionals with different roles in order to gain information from different perspectives.

Another limitation is the use of survey data to measure patients' physical activity levels. Self-reported physical activity levels tend to overestimate actual physical activity levels [48] due to social desirable answers and recall bias [49]. Unfortunately, we were not able to collect longitudinal, objective data of physical activity levels in such a large population (n=1719) due to practical and financial reasons. In a sub-study of ReSpAct, physical activity levels are measured objectively in order to gain insight into the validity and reliability of the survey (i.e. adapted version of the SQUASH) used in our sample. Fortunately, self-reported physical activity levels are available from a large and heterogeneous group of patients during and up to one

year after rehabilitation. In future studies of ReSpAct, this large dataset will be used to gain understanding into the heterogeneity of patients' physical activity levels over time.

Study population

A limitation of the study is the possible selection bias among professionals. We recruited professionals working in one of the participating organizations resulting in a group of professionals that were in general very positive about the program, which may not be representative for all (Dutch) rehabilitation professionals. Therefore, we must be very careful with generalizing our findings to (Dutch) rehabilitation care in general. On the other hand, we were able to report differences in the level of professionals' positivism between organizations that implemented the program with high fidelity levels and moderate fidelity levels ('stable high fidelity' versus 'moderate and improving fidelity', see *chapter 6*). Moreover, we illustrated the importance to engage motivated and enthusiastic professionals in order to achieve successful implementation and sustainability. In other words, without these motivated and enthusiastic professionals it was probably impossible to achieve successful outcomes on the sustainability of the RSE program in Dutch rehabilitation care.

A similar limitation is the possible selection bias among patients enrolled in the ReSpAct study. Participants were asked to fill out a survey at four moments in time, which lasted about 60 minutes per survey. Due to this time investment, it is possible that patients who are interested in sports and physical activities tend to be more likely to participate in the ReSpAct study compared to patients who are not interested in sports and physical activities. This may influence the generalization of our findings, both on short- and long-term outcomes. However, the physical activity levels and

patients' characteristics (e.g. psychosocial status, diagnosis, age) varied substantially illustrating that we were able to include a heterogeneous study population (*chapter 5*).

Implications for rehabilitation

Physical activity promotion

Promoting sports and daily physical activities in rehabilitation is a perfect way to reach people with disabilities. Therefore, promoting daily physical activities should be a standard element of rehabilitation treatment among all in- and outpatients. Besides including sports and physical activities as part of rehabilitation, a focus is particularly needed on realizing a behavioral change to achieve long-lasting physical activity behavior among patients. A client-centered conversation style, such as motivational interviewing, has been shown to be a promising approach for changing lifestyle behavior among different groups of patients [40,50-52], which is also acknowledged by professionals engaged in the ReSpAct study (*see chapter 4 and 5*). An important requirement for success is, however, that professionals are highly skilled and well-trained in motivational interviewing [53].

Furthermore, we recommend starting as soon as possible during rehabilitation with encouraging a behavioral change regarding an active lifestyle at home. A tailored approach depending on patients' characteristics (e.g. stage of change, motivation, mental stage, physical condition) should be applied to determine how and when to start with behavioral change activities. We formulated the following summarizing recommendations to integrate physical activity behavioral change activities into rehabilitation care:

- What: promote sports and daily physical activities in all patients by encouraging a behavioral change
- How: use a client-centered conversation style, such as motivational interviewing, to promote a behavioral change. Tailor the guidance based on patient's personal needs, wishes and characteristics.
- Whom: all members of the multidisciplinary team should promote physical activity among their patients. Sport therapists, physiotherapists and/or physicians can be assigned with key responsibilities regarding physical activity promotion.
- When: start as soon as possible during rehabilitation and continue guidance after rehabilitation.
- Where: during consultations and therapy sessions with several practitioners (e.g. physicians, sport therapists, physiotherapists) and at the 'Sports Counseling Center'

Implementation and sustainability

To implement and sustain physical activity promotion in rehabilitation care, we recommend implementers in rehabilitation care to pay attention to following aspects:

- Ensure active engagement of physician(s) at all time (*chapter 3 and 6*).
- Create local ownership by selecting committed and enthusiastic professionals (e.g. sports therapists, physiotherapists) who are responsible for physical activity promotion during and after rehabilitation (*chapter 3*).
- Implement key components of an evidence-informed procedure and adapt these to the local multidisciplinary context (*chapter 3*).

- Create a change vision that is in line with key components of an evidence-informed procedure (*chapter 6*).
- Remind your colleagues (e.g. colleague physicians, therapists) to promote physical activity among their patients. In addition, promote the existence of the 'sport counseling centers' among other professionals in your organization (*chapter 3*).
- Develop and maintain your knowledge and skills. For counselors, it is important to maintain their motivational interviewing skills by following refresh courses. Furthermore, counselors have to stay up-to-date regarding the sports and exercise facilities outside the rehabilitation center (*this thesis*).
- Monitor and evaluate your work. Create a sustainable monitoring and evaluation system within your organization (*this thesis*).
- Collaborate with rehabilitation professionals within and outside your organization to share knowledge and experiences with each other (*chapter 3*).

Future directions

Rehabilitation practice

Although this thesis elaborates an evidence-informed approach to integrate physical activity promotion in rehabilitation care, some issues are lagged behind. The first issue concerns the roles of rehabilitation professionals; they act as role models for their patients. We know from literature that professionals (e.g. physicians, therapists) who themselves are physically active are more likely to promote physical activities among their patients [54]. So rehabilitation professionals' personal lifestyle seems to be associated with how they stimulate healthy lifestyle in rehabilitation practice

[54,55]. This “*practice what we preach*” phenomenon [55] emphasizes to concentrate physical activity promotion not only on patients, but also on rehabilitation professionals. Moreover, such an approach can be accompanied by additional positive effects on staff productivity and sickness leave [56]. Therefore, we recommend rehabilitation centers and hospitals to invest in activities to promote physical activity among their employees (e.g. physicians, therapists) due to the potential benefits on patient level (e.g. physical activity levels) and on organization level (e.g. staff productivity and sickness leaves).

The second issue concerns the physical environment of the rehabilitation center and hospital. Environmental factors can influence patients’ physical activity behavior [25,57]. To illustrate, several (academic) hospitals in the Netherlands initiated plans to transform their hospital into an “*Exercise hospital*” (in Dutch: ‘Bewegziekenhuis’) [58]. We recommend rehabilitation centers and rehabilitation departments in hospitals to follow this approach and create an environment and infrastructure that stimulates patients *and* professionals to be physically active.

The last (summarizing) issue that needs more attention in (Dutch) rehabilitation practice is the concept of ‘*Exercise is medicine*’ [59]. The RSE program, as an evidence-informed physical activity counseling program, fits perfectly within the ‘Exercise is medicine’ concept. Although several steps are taken to integrate this concept into Dutch healthcare (cf. [60,61]), it deserves more structured attention in rehabilitation care. The global ‘Exercise is medicine’ network might be an excellent way to share knowledge and to learn from other settings and other countries [59].

Future research directions

ReSpAct 2.0

This thesis is the first ReSpAct-thesis, but hopefully not the last one. Although we are currently working on the evaluation of the long term patient outcomes (e.g. physical activity, quality of life, and healthcare consumption/costs) [62], many other questions are still unanswered. Future (PhD-) projects should gain further insight into the underlying working mechanisms of physical activity counseling after rehabilitation, in which special attention is needed to gain more insight into the role of fatigue and activity pacing behavior on patients' physical activity behavior. Such insights are relevant for both research and rehabilitation practice in order to further optimize the RSE program.

Furthermore, an additional measurement occasion can be organized to provide insight on patients' outcomes on the longer term (i.e. five years after rehabilitation), in which we advise to seek for possibilities to measure physical activity levels objectively. At the same time, the ReSpAct 2.0 database might be used to compare outcomes of patients enrolled in the ReSpAct-study with (healthy) participants enrolled in other cohorts (e.g. AGGO VU [63], Lifelines [64], GOUD Erasmus [65], The Maastricht Study [66]).

Lastly, ReSpAct 2.0 should focus on further optimization and innovation of the counseling component of the RSE program. More specifically, better understanding is needed on how to provide physical activity counseling in a more tailored and personalized way. The use of e-health and m-health in promoting physical activity should be studied further in this context. For example, mobile-based approaches including theory-based feedback systems are promising to stimulate daily physical

activities among older adults in a tailored way (cf. [67]). In the context of physical activity promotion after rehabilitation, we need better understanding on what patients may or may not benefit from e-/m-health-based counseling. Collaborations may be established to gain insight and knowledge from previous and ongoing projects, such as PreventIT [68] and Wheels [69]. Ultimately, such insights should provide practitioners with more specific guidelines and tools on how to tailor physical activity counseling among people with disabilities and/or chronic diseases, which may contribute to further improvement of physical activity counseling after rehabilitation.

Implementation science

Implementation science has elaborated as a 'stand-alone' research field illustrated by the identification of at least sixty implementation models [70,71], more than seventy implementation strategies [72,73] and more than 600 implementation determinants [74]. Despite the impressive richness of the field, the 'implementation-gap' still exists indicating that implementation studies are still needed, though with different priorities [19].

A first priority is the focus on the sustainability of programs [1,3,4]. There is a need to gain more understanding which strategies should be applied to achieve long-term sustainability. However, this research priority "*is easier said than done*", because it requires an infrastructure in which research funding is available over a long period of time (>5 year), which is typically not the case. So this indicates that funding agencies should also shift their focus and provide funding to research projects lasting a long period, as already highlighted previously [1].

The second priority that needs to be studied is the (cost-) effectiveness of tailored implementation strategies in comparison with other (tailored) implementation

strategies. We need more insight into what kind of strategies are most (cost-)effective under which circumstances and in which settings [18].

Lastly, (inter)national collaborations and networks on implementation research (e.g. Netherlands Implementation Collaborative [NIC], European Implementation Collaborative [EIC]) should be further elaborated and intensified. Since implementation science is a 'field-overarching' area, collaborations between researchers from different fields (e.g. healthcare, education, business) are essential to increase our knowledge and expertise on implementation processes. Moreover, healthcare implementation research may benefit more from the expertise from the business (change) management research. An example of a fruitful collaboration between healthcare and business management is the expertise center 'Healthwise', a collaboration between the Faculty of Economics and Business of the University of Groningen and the University Medical Center Groningen in the Netherlands.

Physical activity (policy) research

Although the number of publications on physical activity policies has increased in the last decades [75], policy research regarding physical activity promotion is still in a beginning stage [75,76]. Even less is known about effective national policy approaches to promote physical activity among adults and children with disabilities. As illustrated in *chapter 7*, a comparison of disability sport policies among different countries (e.g. Canada, the Netherlands) gives the opportunity to learn from each other. However, this study was just an initial small step to gain more insight into a complex and multidimensional field of policy research. Future studies are needed to compare sports and physical activity policies focusing on disabled populations among more countries throughout the world. The para-SPLISS project is an example of an

international comparison study on disability sports policies in different countries [77]. In addition, we recommend countries to collect population-level data on physical activity levels among people with disabilities. This will give the opportunity to compare these data among different countries and establish so-called ‘Physical Activity Country Cards’ [78] for disabled populations. Moreover, these population-level physical activity data will help to increase our knowledge on effective physical activity policies that are successfully targeting disabled populations.

Furthermore, future studies are needed on effective ways to create a society in which there are sufficient and accessible sports and exercise facilities for people with disabilities. As described in *chapter 7*, the current Dutch national program ‘Active without boundaries’ (in Dutch: ‘Grenzeloos Actief’) is a promising approach to create sports and exercise facilities across the whole country that are in line with needs and wishes of disabled populations. A key component of this approach is to create regional partnerships between organizations (e.g. rehabilitation centers, healthcare, schools), sports and exercise providers (e.g. fitness clubs), and local governmental agencies (e.g. municipalities). Future studies should be conducted to evaluate such partnerships and to gain understanding how they can be created and operated in an effective and sustainable manner.

Society

Sustainable partnerships: policy – practice – research

As already discussed in a previous section, the well-defined roles of the different stakeholders (Ministry, program coordinators, practitioners, researchers) contributed to the successful sustainability of the RSE program. Although working in such a

partnership sounds very promising, in our case it was not (yet) a sustainable partnership. Creating sustainable partnerships between researchers and research-users (e.g. policy makers, practitioners) can contribute to conducting relevant research by involving research-users within the research cycle [79-81]⁸. The idea is that research that is designed and/or conducted within such partnerships is more likely to make impact on policy and/or practice, and can potentially bridge the gap between research and practice [82]. However, the establishment of such partnerships is a complicated and often a long-lasting process due to the uniqueness of each field (research, policy, practice) and the differences in working processes [83].

Despite this complexity, several examples of (sustainable) partnerships exist in both rehabilitation practice (e.g. Canadian Disability Participation Project [84], knowledge brokers in stroke care [85,86]) as well as in physical activity promotion or public health (e.g. Collaborations for Leadership in Applied Health Research and Care (CLAHRC) [87], Academic Collaborative Centers for Public Health [88]). The process of establishing and working in partnerships to conduct impactful research, should be studied in more detail in order to understand how partnerships on health (e.g. physical activity) promotion among disabled populations can be created in a sustainable and effective way [79].

General conclusion

This thesis described a successful example of a nationwide implementation process of a physical activity promotion program targeting people with disabilities and/or chronic diseases in Dutch rehabilitation care. Due to the strong theoretical and

⁸ This concept is also known as “Integrated knowledge translation”.

evidence-informed foundation of the program in combination with its tailored, though ‘disability-overarching’, approach the findings of this study might be broadly applicable. An important part of the program was to set up ‘sports counseling centers’ across the country to help patients in making the step from rehabilitation-based physical activities to community-based physical activities. The use of an intensive, well-planned, and multifaceted implementation strategy in combination with clear role descriptions of involved stakeholders (e.g. Ministry, program coordinators, practitioners, researchers) were key ingredients for the successful sustainability of the program after the funded period. When scaling up national programs to local settings, we suggest to apply a tailored implementation strategy depending on organization’s starting positions, organization’s size and organizational circumstances. Moreover, we provide directions for future optimization of physical activity promotion after rehabilitation by using a more tailored approach based on patients’ characteristics, needs and wishes. Our findings may inspire governmental agencies around the world to promote sports and physical activities among disabled populations by using an evidence-informed approach focusing on places where they can be reached easily (e.g. rehabilitation centers).

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