Care to move!

A mixed-methods evaluation
of care–physical activity initiatives
for citizens with a low socioeconomic status

Lisanne Sofie Mulderij

Propositions

1. Without attention to livelihood security, care-physical activity initiatives are pointless.
   (this thesis)

2. Life-long changes require life-long support.
   (this thesis)

3. Science must learn from imperfect studies, hence the need to publish them.

4. Quantitative data have no value without qualitative data.

5. Lay knowledge is more important than scientific knowledge.

6. Article submission is an unnecessarily laborious process.

7. Crises are needed to put governments on edge.

Propositions belonging to the thesis, entitled

Care to move! A mixed-methods evaluation of care-physical activity initiatives for citizens with a low socioeconomic status

Lisanne Sofie Mulderij
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Chapter 1

General introduction

Introduction

Care–physical activity (care–PA) initiatives, in which the healthcare and PA sectors collaborate, have been developed to improve the health and lifestyle of citizens and reduce the risk of developing chronic diseases by increasing daily PA and improving dietary behaviours [1, 2]. However, the impact, perceptions and effective elements of these initiatives, as well as their public support, are yet to be fully determined, especially for programmes developed for citizens with a low socioeconomic status (SES). The aim of this thesis is therefore to contribute knowledge and insights about care–PA initiatives for citizens with a low SES, so that existing and future initiatives can be adapted to better suit these people.

This chapter starts with an overview of the health status of Dutch citizens regarding overweight, obesity and chronic diseases, followed by some insights into the PA and nutritional status of the population. Second, we describe the political context regarding health care, health promotion and disease prevention, and how this has changed over time. Third, care–PA initiatives, including the initiative that is the focus of this thesis, are introduced. Fourth, the aim and research questions are presented. The chapter ends with a general outline of the thesis.

Health status of Dutch citizens

Overweight, obesity and chronic diseases
Today's overweight and obesity rates are unfavourable. They have increased over the past decades, leading to the World Health Organization (WHO) declaring obesity an epidemic in 1997, and are expected to further increase in the future [3]. Globally, 39% of citizens were overweight in 2016, indicating that their body mass index (BMI) was greater than or equal to 25 kg/m^2 [4]. At that time, 13% of people were obese (BMI≥30 kg/m^2), which was almost triple the percentage in 1975 [4]. The Netherlands also has high overweight and obesity rates, with 49.4% of adults (18+) being overweight and 14.7% being obese in 2020 [5]. It is expected that these rates will increase in the coming decades [6], which might also result in higher percentages of citizens with one or more chronic diseases. Several studies have shown that being overweight or obese is associated with an increased incidence of chronic diseases, such as diabetes, hypertension and heart disease [7–9]. In the Netherlands, 50% of all adults suffered from at least one chronic disease (e.g., diabetes, arthrosis or heart disease) in 2015, and it is expected that this percentage will increase to 54% by 2040 [6, 10]. Furthermore, about 25% of Dutch adults suffered from more than one chronic disease in 2015, which is expected to increase to about 30% of the population by 2040 [6].

The increasing overweight and obesity rates and the higher prevalence of chronic diseases have a negative influence on population health. For instance, severe obesity (a BMI of 35 to 40 kg/m^2) has been shown to be associated with living fewer years in good perceived health and fewer years without chronic diseases compared with people with a healthy body weight [11]. Dutch citizens with at least one chronic disease also

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have lower quality of life (QoL) scores than the general Dutch population, especially for people who experience physical limitations [12]. In addition, life expectancy decreases as the number of chronic diseases one suffers from increases [13]. The increased prevalence of chronic diseases also negatively affects society, since people suffering from chronic diseases participate less in paid and voluntary work than those without a chronic condition [14].

Physical activity and healthy nutrition
Physical inactivity has been identified as the fourth leading risk factor for global mortality, while regular PA contributes to better physical and mental health; fewer chronic diseases; improved strength, fitness and societal participation; higher self-esteem; lower stress levels and a better QoL [15, 16]. In addition, higher levels of PA reduce healthcare costs [17]. In 2020, almost 50% of the Dutch adult population did not meet the *Dutch Standard for Healthy Exercise* (i.e., at least 150 minutes of moderately intense exercise per week, such as walking and cycling, spread over several days, supplemented by muscle- and bone-strengthening activities twice a week) [5].

Healthy nutrition is also seen as a protective factor against overweight, obesity and several chronic diseases [18, 19]. Because of this, the Health Council of the Netherlands developed the *Guidelines for Good Food* in 2015, indicating for instance that adults should eat at least 200 grams of fruits and 200 grams of vegetables per day [20]; however, a year later, only 13% of the adult population met this guideline regarding fruits and only 16% of adults consumed sufficient vegetables [21]. Low PA levels and insufficient fruit and vegetable intake could therefore explain the high (and rising) overweight and obesity rates. Promoting PA and healthy nutrition as part of preventing overweight, obesity and several chronic diseases could benefit the health of our population, and is therefore important [18, 19, 22].

Health inequalities
People who are overweight, obese or living unhealthy lifestyles are not equally distributed throughout the population; they are more likely to be people with a low SES [23, 24]. The prevalence of these health issues decreases as SES increases, indicating that health inequalities exist between people with differing SESs, where SES is measured by level of education, income level, occupational status or a combination of these [23–25]. Here, citizens with a low SES are defined as people with a low education level[1] or an income at or below the minimum wage level [26]. In the Netherlands, being overweight is more common among people with a low SES than people with a high SES (60.9% versus 43.0% of each group, respectively, in 2020), as is obesity (20.9% versus 8.5% in 2020) (Table 1.1) [6]. Furthermore, the lifespan of Dutch citizens with a low SES is about six years shorter, with 19 fewer years in good perceived health, than citizens with a high SES [6]. With regards to their PA levels, only 38.8% of people with a low SES met the Dutch Standard for Healthy Exercise in 2020, while 62% of people with a high SES

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1   Leaving after primary school, preparatory secondary vocational education, senior secondary vocational education level one, or the first three years of senior general secondary education or pre–university education.

met this target [27]. Moreover, the percentage of people who exercise weekly is lower for people with a low SES (29.7%) than for people with a high SES (68.3%). Concerning nutrition, fewer adults with a low SES met the daily recommendations for fruit and vegetable intake in 2016 (10% for fruits, 8% for vegetables) than people with a high SES (17% for fruits, 24% for vegetables) [21]. Lastly, citizens with a low SES have a higher healthcare utilisation and healthcare expenditure than those with a higher SES [28, 29]. It is expected that health inequalities will continue to grow in the coming decades [6], the avoidance of which will require preventative action.

Table 1.1 Percentages of the Dutch population meeting certain health and lifestyle indicators, broken down by SES [5, 6, 21, 27].

	Overweight[a] (%)	Obese[b] (%)	Not meeting Dutch Standard for Healthy Exercise (%)	Not meeting recommendations for fruit and vegetable intake (%)
Total Dutch population	49.4	14.7	50.0	85.5
Low SES[c]	60.9	20.9	61.2	91.0
High SES	43.0	8.5	38.0	79.5

[a] BMI≥25 kg/m²; [b] BMI≥30 kg/m²; [c] Low educational level (leaving after primary school, preparatory secondary vocational education, senior secondary vocational education level one, or the first three years of senior general secondary education or pre–university education) or low income at or below the minimum wage level [26].

Political context

To understand the context in which care–PA initiatives have been introduced and implemented in the Netherlands, it is relevant to obtain insights into the political context of health promotion and prevention both globally and nationally. Recently, more attention has been paid to the development of policies for health promotion and prevention at the local, national and global scales, due in part to the growing insights into the health status of citizens. For instance, the WHO published the *Global Action Plan on Physical Activity 2018–2030* in 2018, with the aim of providing countries around the world with guidance on policy actions to increase PA among their populations [30]. The report proposes that walking and cycling should be encouraged as a method of transportation, and that sport and active recreation should be promoted. The report stresses the role of healthcare providers and social care providers in helping citizens to become more active. Furthermore, the report mentions that programmes should reach all strata of the population and should be tailored to the specific target audiences [30]. These guidelines underline the need for policies that promote PA among the population and emphasise the necessity of an integrated approach, which in the report is defined as *"whole-of-community initiatives, at the city, town or community levels, that stimulate engagement by all stakeholders and optimize a combination of policy approaches, across different settings, to promote increased participation in physical activity and reduced sedentary behaviour by people of all ages and diverse abilities, focusing on grassroots community engagement, co-development and ownership"* (WHO, 2018, p. 37) [30]. Such an approach

was also recommended in previous research for the prevention of obesity [31]. In 2019, the WHO also published *Sustainable Healthy Diets: Guiding Principles*, which presents guidelines that contribute to achieving the Sustainable Development Goals, such as *good health and wellbeing* [32, 33]. In that report, guiding principles for sustainable healthy diets are presented, which are divided into groups of those guidelines targeting the health aspects, environmental impacts and sociocultural aspects of diets [32]. These guidelines were developed with the aim of, among others, preventing overweight, obesity and chronic diseases.

The Netherlands has also made changes regarding health care, including health promotion and prevention, in the last two decades. In 2006, a major healthcare reform took place, which led to the *Healthcare insurance Act* [34]. The aim was to improve the quality of curative health care and to keep health care affordable by introducing regulated competition in a) the healthcare insurance market (healthcare insurance companies compete for the favour of the insured); b) the healthcare delivery market (civilians are encouraged to behave as responsible and critical healthcare consumers and choose high-quality care); and c) the healthcare purchase market (providers negotiate with purchasers on tariffs for treatments and diagnosis-related groups (DRGs), with a growing percentage of freely negotiable DRGs) [35, 36].

The second part of the healthcare reform took place in 2015, causing Dutch health care to become more decentralised. This meant that local municipalities took on more of the responsibilities concerning health care and prevention, including the prevention of overweight and obesity [37]. The new responsibilities of the municipalities were specified in the Public Health Act as *"health protection and health promotion measures for the population or specific groups thereof, including the prevention and early detection of diseases"* (Soeters & Verhoeks, 2015, p. 13) [38]. From that moment on, healthcare insurance companies were mostly responsible for the secondary and tertiary prevention of disease (i.e., if there is (an increased risk of) health damage), but not for the primary prevention of disease, based on their duty of care [38, 39]. As such, municipalities were responsible for preventing the onset of diseases, while healthcare insurance companies were responsible for preventing the escalation of diseases. This meant that the healthcare insurance companies only received payment if they prevented further health damage from occurring (secondary and tertiary prevention), which did not stimulate them to invest in the initial prevention of overweight and obesity [38, 39]. One of the specified responsibilities of the municipalities was therefore to contribute to the design, implementation and co-ordination of prevention programmes, including health promotion. The perceived importance of prevention has varied between health ministers over the past few years however, for instance because of doubts about the effectiveness of prevention and/or priorities in other domains, which often leads to insufficient action in enhancing the health of citizens [38, 40].

Following the appointment of a new State Secretary for Health, Welfare and Sport in 2017, disease prevention gained more attention, and the *National Prevention Agreement* was written in 2018. One of the aims of this agreement was to tackle overweight and obesity rates among Dutch citizens, focussing on four main goals: promoting healthy

eating; making sports and PA more attractive; developing a healthier environment for those who need it; and providing appropriate sport and exercise programmes for overweight and obese citizens [41]. The agreement stresses the importance of an integrated approach at the local level to achieve these goals. This means that different local sectors and actors both inside and outside the public health domain should work together in different settings to improve the health of Dutch citizens.

The degree of political focus on health is highly reflected in the extent to which health promotion and prevention measures are covered by healthcare insurance schemes. For example, the introduction of the *National Prevention Agreement* stimulated that combined lifestyle interventions (CLIs) for people who are overweight were covered by the basic healthcare insurance scheme from January 2019. CLIs are lifestyle interventions that tackle multiple health behaviours with the aim of improving participants' health and lifestyle. From 2019, three CLIs were covered by the basic healthcare insurance scheme (CooL, BeweegKuur and SLIMMER), and in 2020 Samen Sportief in Beweging (SSiB) was added as well [42–45]. These CLIs fulfil the Dutch criteria for successfully and effectively promoting healthy lifestyles [40]; however, only the health care-related portion of these CLIs (i.e., care provided by lifestyle coaches, dietitians or physiotherapists) is paid for by the healthcare insurance companies. Participants have to pay for any PA component of the CLI themselves because PA is not considered health care, and therefore healthcare insurance companies do not reimburse it. In some instances, the local municipalities or healthcare insurance companies do pay for CLI-related PA, such as when local agreements have been made to offer the CLIs to people with a low SES. Unfortunately, recent research has shown that fewer people participate in the covered CLIs than expected [40]. Another issue is that CLI practitioners experience problems, such as the different policies and requirements of the different healthcare insurance companies or high investment costs and risks for the implementers [40]. These bottlenecks hamper the implementation of the CLI. The new Dutch government, which took office in 2021, is not expected to boost the implementation of CLIs, since the coalition agreement for 2021–2025 barely mentions disease prevention, healthy lifestyles, PA and sports [46]. The few health-related goals that have been mentioned are set for 2040, which indicates that the current government places little priority on healthy lifestyles and PA.

Care–PA initiatives and X-Fittt 2.0

The *Global Action Plan on Physical Activity 2018–2030* and the *National Prevention Agreement* stress the need for an integrated approach to health promotion [30, 41]. An example of such an integrated approach is the use of care–PA initiatives, in which the primary care sector (e.g., physiotherapist or dietitian) and the sport and PA sector (e.g., sports centres or PA lessons at community centres) collaborate with the goal of stimulating and maintaining PA and healthy nutrition among citizens who have or are at risk of chronic diseases, such as obesity and diabetes [1]. Care–PA initiatives can be seen as examples of CLIs because they focus on multiple health behaviours, such as PA

and nutrition, and aim to improve the health and lifestyle of citizens. Not all CLIs are care–PA initiatives however, since not all CLIs include a PA component; for example, BeweegKuur, SLIMMER and SSiB are care–PA initiatives, whereas CooL is not.

When this PhD project started in 2016, the care–PA initiatives BeweegKuur and SLIMMER already existed and focussed on the general population, but they had not yet been used on a large scale. Furthermore, at that time there were no care–PA initiatives specifically developed for overweight and obese citizens with a low SES, despite the needs of a population with a low SES potentially differing from the needs of the general population. For example, people with a low SES experience different barriers to being physically active and living a healthy life, such as a lack of money or social support, illness or disability, or low self-efficacy [47–51]. This means that what works for the general population with regards to care–PA initiatives may not necessarily work for a population with a low SES.

To meet this need in the Dutch city of Arnhem, local health promotion actors jointly developed a care–PA initiative, X-Fittt 2.0, that targeted people with a low SES in neighbourhoods with a relatively high percentage of citizens with a low SES [52]. This care–PA initiative, which aimed to improve participants' health and lifestyle, is the subject of this thesis. X-Fittt 2.0 is a two-year programme consisting of two phases: a 12-week intensive programme and a 21-month aftercare phase (Figure 1.1). During the first 12 weeks, the participants received intensive guidance in developing a healthy lifestyle (i.e., sufficient PA and healthy eating habits), consisting of four parts: two sports sessions per week in a group with guidance by a sports coach and one individual weekly sports session; dietary advice and monitoring by a dietitian throughout the first 12 weeks; coaching from a lifestyle coach throughout the first 12 weeks to work on personal goals; and two appointments with a physiotherapist to gain insights into body measurements and fitness. After the first 12 weeks, the participants received 21 months of aftercare. During this phase, the participants receive coaching by a lifestyle coach to work on their personal goals and to encourage behavioural maintenance regarding a healthy lifestyle.
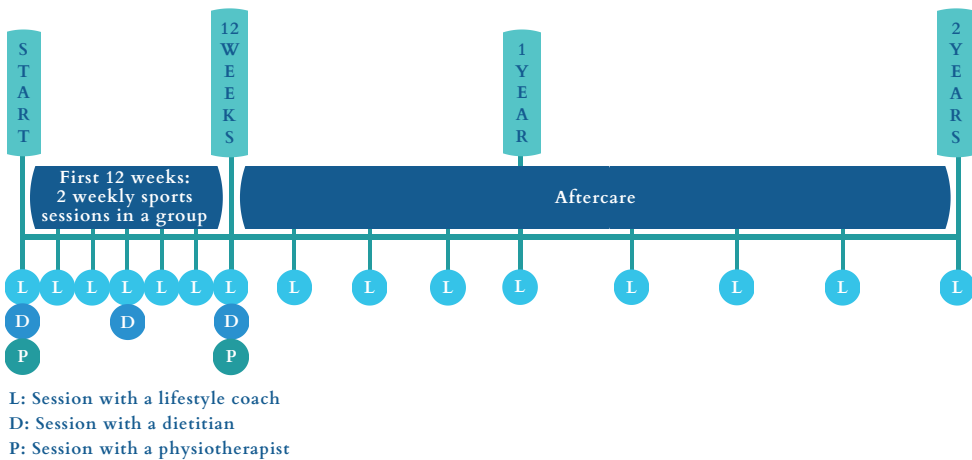
First 12 weeks:
2 weekly sports
sessions in a group

Aftercare

L: Session with a lifestyle coach
D: Session with a dietitian
P: Session with a physiotherapist

Figure 1.1 Overview of the X-Fittt 2.0 programme, based on Verkooijen & van Valburg (2019) [52].

Aim and scope of this thesis

The aim of this thesis is to contribute knowledge and insights about care–PA initiatives for citizens with a low SES, so that existing and future initiatives can better suit this group. Since care–PA initiatives for citizens with a low SES are rather new, we aim to study the impact and effective elements of such initiatives, as well as the experiences of the participants and the public preferences for such initiatives. In the light of this aim, seven research questions are formulated (Table 1.2).

First, care–PA initiatives are deemed effective for the promotion of PA and healthy lifestyles for the general population, and therefore improve the health and QoL of their participants [43, 44]; however, they are typically developed for the general population and not specifically for citizens with a low SES. Consequently, little is known about their effectiveness and impact on health, QoL, societal participation and healthcare utilisation for this specific population. Such information can contribute to the development of care–PA initiatives that positively affect the health of citizens with a low SES, and thus decrease overweight and obesity rates and health inequalities. The following research questions are therefore addressed: 1) '*What are the short- and long-term outcomes of participation in X-Fittt 2.0, in terms of health, QoL and societal participation?*' and 2) '*What is the impact of participation in X-Fittt 2.0 on the healthcare utilisation of citizens with a low SES?*'

Second, because X-Fittt 2.0 was the first care–PA initiative for people with a low SES, it is important to evaluate how participants experience the programme. These insights contribute to improving existing CLIs, including X-Fittt 2.0, so that they better meet the needs of participants with a low SES and thereby become more effective. To obtain these insights, the following research question is addressed: '*What are the experiences of the participants in the combined lifestyle intervention X-Fittt 2.0?*'

Third, in order to improve or develop new CLIs, it is necessary to understand what works. Some studies have specifically identified the effective elements and preconditions for lifestyle or PA interventions in terms of the general population [53–55]; however, people with a low SES might have different needs regarding care–PA initiatives than people with a higher SES. Identifying the effective elements of care–PA initiatives for this group is therefore crucial, particularly as overweight and obesity are more common among people with a low SES, and little is known about what works for them in improving their health and lifestyles. The absence of such understanding led to two research questions: 1) *'What are the effective elements of X-Fittt 2.0, a care–PA initiative for people with a low SES?'* and 2) *'What are the effective elements of care–PA initiatives for adults with a low SES in the Netherlands, based on the experiences of health promotion experts?'*

Lastly, CLIs are currently funded by the basic healthcare insurance scheme. In the Netherlands, this means that the general population indirectly pays for these initiatives through premiums and taxes; however, the public does not have a say in what is covered by the basic healthcare insurance scheme and what is not. It is therefore relevant to ask the general public what their preferences are regarding the public funding of projects that aim to reduce overweight and obesity rates among people with a low SES. Furthermore, it is important to know whether the current range of health promotion programmes for citizens with a low SES, such as CLIs, meet their needs, or whether they would prefer a different selection. Such knowledge is currently lacking, but could be useful for policymakers when making decisions on the allocation of public funding for health promotion. To obtain such knowledge, two research questions were formulated, where we focused on low income instead of low SES to improve understandability among respondents: 1) *'What are citizens' preferences regarding the public funding of projects that promote a healthy body weight among people with a low income, and do these preferences differ between people with different incomes?'* and 2) *'Why do citizens prefer certain projects that promote a healthy body weight among people with a low income over others?'*

This study adopts a mixed-methods research approach to obtain a complete picture of care–PA initiatives for people with a low SES (Table 1.2). To answer research questions 1 and 2, we conduct a quantitative analysis of questionnaires, body measurements and healthcare claims data, as well as a qualitative analysis of group discussions and semi-structured interviews with participants. To answer research question 3, we conduct a qualitative analysis of group discussions and semi-structured interviews with participants. Research questions 4 and 5 are tackled by applying concept mapping with professionals and one participant of X-Fittt 2.0, and with health promotion experts. To answer research questions 6 and 7, we conduct a participatory value evaluation among the general population. A more detailed description of the specific methods is provided in the corresponding chapters. We believe that the use of mixed methods enables us to obtain a more complete picture regarding care–PA initiatives for people with a low SES [56].

Table 1.2 Overview of the chapters, research questions and methods.

Chapter	Research question	Methods
4	1. What are the short- and long-term outcomes of participation in X-Fittt 2.0, in terms of health, QoL and societal participation?	Mixed methods: questionnaires; body measurements; group discussions; semi-structured interviews
5	2. What is the impact of participation in X-Fittt 2.0 on the healthcare utilisation of citizens with a low SES?	Quantitative: healthcare claims data
6	3. What are the experiences of the participants in the combined lifestyle intervention X-Fittt 2.0?	Qualitative: group discussions; semi-structured interviews
7	4. What are the effective elements of X-Fittt 2.0, a combined lifestyle intervention for people with a low SES?	Qualitative: concept mapping
8	5. What are the effective elements of care–PA initiatives for adults with a low SES in the Netherlands, based on the experiences of health promotion experts?	Qualitative: concept mapping
9	6. What are citizen preferences regarding the public funding of projects that promote a healthy body weight among people with a low income and do these preferences differ between people with different incomes?	Mixed methods: participatory value evaluation
	7. Why do citizens prefer certain projects that promote a healthy body weight among people with a low income over others?	

Outline of this thesis

This thesis studies care–PA initiatives for people with a low SES, specifically focussing on seven research questions. **Chapter 2** provides a detailed description of the theoretical considerations, as well as the design of, and the methods used in, this thesis. **Chapter 3** describes the adaptations made to the study protocol because of changes in the research context and the availability of data, and based on new insights among the research team. **Chapter 4** presents the findings from a mixed-methods study on the impact of X-Fittt 2.0 on its participants with regards to health, QoL and societal participation. In **Chapter 5**, healthcare claims data are studied to discover the impact of X-Fittt 2.0 on participants' healthcare utilisation. **Chapter 6** shows the qualitative evaluation of X-Fittt 2.0, using group discussions and semi-structured interviews with its participants. In **Chapter 7**, the effective elements of X-Fittt 2.0 are identified using concept mapping with professionals connected to, and one participant of, the care–PA initiative. **Chapter 8** outlines a second concept-mapping study that unravels the effective elements of care–PA initiatives for people with a low SES, exploring the experiences of health promotion experts who have expertise in the field of care–PA initiatives for people with a low SES. In **Chapter 9**, citizen preferences regarding the funding of health-promoting projects are studied using a participatory value evaluation among the general Dutch population. The final chapter, **Chapter 10**, summarises and integrates the findings from the previous chapters to answer the research questions. Moreover, it presents recommendations for policymakers and health promotion practitioners who aim to enhance the health and lifestyle of people with a low SES, as well as providing suggestions for future research.

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Chapter 2

Care–physical activity initiatives in the neighbourhood: Study protocol for mixed-methods research on participation, effective elements, impact, and funding methods

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Abstract

In the Netherlands, people with a low socioeconomic status (SES) live approximately 6 years less and are less engaged in physical activity (PA) than high SES citizens. This contributes to the persistent health inequalities between low and high SES citizens. Care–PA initiatives are deemed effective for stimulating PA and improving health and participation among people with a low SES. In those initiatives, multiple sectors (e.g., sports, health insurers, municipalities) collaborate to connect primary care and PA at neighbourhood level. This study focuses on two Dutch municipalities that aim to invest in Health in All Policies (HiAP) and care–PA initiatives to improve the health of people with low SES. The aim is to gain insight into the short-term (three months) and long-term (2 years) outcomes of participating in care–PA initiatives for low SES citizens in terms of health, quality of life, and societal participation; the effective elements that contribute to these outcomes; the direct and perceived societal costs and benefits of care–PA initiatives; and alternative ways to fund integrated care, prevention, and care–PA initiatives at neighbourhood level. The study will be built on a mixed-methods design guided by action research to continuously facilitate participatory processes and practical solutions. To assess outcomes, body measurements and questionnaires will be used as part of a pre-test/post-test design. Focus groups and interviews will be conducted to gain an in-depth understanding of outcomes and action elements. Action elements will be explored by using multiple tools: concept mapping, the logic model, and capacity mapping. Direct and perceived societal costs will be measured by administrative data from healthcare insurance companies (before-after design) and the effectiveness arena. An alternative funding model will be identified based on literature study, expert meetings, and municipal workshops. Initiatives addressing multiple factors at different levels in an integral way are a challenge for evaluation. Multi-methods and tools are required, and data need to be interpreted comprehensively in order to contribute to a contextual insight into what works and why in relation to HiAP and care–PA initiatives.

Introduction

Socioeconomic status (SES) is strongly related to health. In the Netherlands, people with high SES live approximately 6 years longer than people with lower SES [1]. Furthermore, people with high SES live approximately 19 years longer in good perceived health than people with lower SES [1]. Socioeconomic inequalities in health, or health inequities [2], are related to many causes of death and types of illness [3] and have proved to be persistent and seemingly unaffected by Dutch policy measures to date [1].

Although people in the Netherlands have become more physically active over the past years, those with low SES are less engaged in physical activity (PA) than high SES groups [4]. PA is an important contributor to health and well-being, and physical inactivity has been identified as the fourth leading risk factor for global mortality [5]. Health disorders associated with inactivity impose a substantial burden on societies and health systems [6]. In order to improve population health, to close the health gap between groups with higher and lower SES, and to reduce healthcare costs, the Dutch national government requires municipalities to implement Health in All Policies (HiAP) [7, 8], to provide care and PA close by, in the neighbourhood [7], and to stimulate citizens' societal participation [9]. However, such policy and initiatives have not been evaluated comprehensively because of their complexity. Therefore, there is no insight into what works and why, i.e., what are the effective elements? Another question is how such initiatives should be funded. This study aims to get a comprehensive insight into HiAP, care–PA initiatives, societal participation, effective elements, and funding. Therefore, in the remaining part of this section, we address these topics and, subsequently, the research questions.

It is assumed that HiAP, in which sectors inside and outside the public health domain are made compatible, is effective in reducing socioeconomic health inequities [2, 10]. The approach explicitly emphasises that the promotion of health is the responsibility of all relevant sectors [11]. Therefore, different sectors are required to collaborate and reach a high level of agreement [12]; but this is challenging given, for example, differences in culture and interest [13]. It is recognised that multiple strategies across multiple levels are most effective in improving health and that there is a significant need for evaluation of such initiatives [14].

In care–PA initiatives, the primary care sector (e.g., physiotherapist, dietitian, general practitioner) and the sport and the PA sector (e.g., sports club, fitness centres, PA lessons at community centres) collaborate with the aim of stimulating and maintaining PA among citizens who have, or are at risk of, chronic diseases such as diabetes and obesity. A recent literature review indicated that two different approaches in care–PA initiatives can be distinguished [15]. In the first approach, a primary care setting refers primary care patients to sport facilities through referral schemes. In the second approach, activities are organised by a network of primary care and sport professionals, for example a fitness centre that collaborates with primary care professionals to implement a programme. Care–PA initiatives focus primarily on prevention rather than on cure and are deemed

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effective for stimulating PA and improving health, quality of life, and (societal) participation among low SES citizens [12, 14].

In the Netherlands, participation in society (e.g., being employed, being part of a social network, or being a member of an association [16]) is emphasised by the Social Support Act [9], which came into force in 2007. Participation in society is considered crucial as it contributes to health by supporting the development of social capital and quality of life [17] and health and well-being [18]. Participation in health promotion initiatives contributes to the creation of supportive environments for health and the effectiveness of initiatives [19]. The World Health Organization defines participation as one's 'involvement in a life situation' [20, p. 10].

The effective elements concept is often used interchangeably with similar concepts, e.g., principles for action as advocated and put centre core in current health promotion by the WHO and others [21, 22]. In this study, we use the effective elements concept as we aim to unravel the elements that make HiAP and care–PA initiative work to improve health and diminish health inequities. The underlying assumption of effective elements is that the effectivity of an initiative is caused by multiple principles or elements in combination. These elements are based on an ecological perspective on human health [23, 24], which emphasises the need for actions that are empowering [25], participatory [26, 27], intersectoral, equitable, and sustainable, and that use multiple strategies [28]. Moreover, effective elements relate to the capacity to develop and implement policy or initiatives that result in the desired output [29], emerge in practice, and depend largely on contextual factors and the knowledge and skills of the stakeholders involved [23].

The way care–PA initiatives need to be funded, especially for citizens with low SES, is a current topic of discussion, at both national and local policy level. Previous research has shown that willingness to pay (WTP), i.e., the maximum price one is willing to pay for example for health improvements [30], is limited [31]. A Dutch study among socially vulnerable groups found WTP for participating in a PA initiative to be 9.60 euro per month on average, and 16% were not willing to pay at all for sport and PA [31]. Therefore, it is important to address the question of who should pay for care–PA initiatives. Should this be participants or, for example, municipalities or health insurers? In the Netherlands, prevention is often not covered by health insurers, as current healthcare funding is based on fee for service systems (FFS) [32]. This means that healthcare providers are paid for the (curative) service they deliver, and this incentivises healthcare providers to increase their services (and, hence, healthcare costs) [32, 33]. In addition, citizens are not encouraged to take responsibility for their own health [34]. Alternative forms of funding (e.g., population-based funding) are promising as the focus is on citizens' health, and possible savings are shared between healthcare providers [35]. In these alternative funding forms, stakeholders (healthcare providers, policymakers, insurers) need to collaborate, and perceptions need to be shifted to more positive conceptions of health, including patients' societal participation [35]. Therefore, an important question to be addressed is what innovative funding methods are best to finance care–PA initiatives in order to enhance participation among socially vulnerable citizens and to contribute to limiting healthcare costs.

In this paper, we present a study protocol for a mixed-methods study to be implemented in two Dutch municipalities with the aim of gaining insight into strategies to develop, implement, and maintain HiAP and care–PA initiatives targeting citizens with low SES, the impact of these initiatives on outputs and outcomes, including societal participation, the effective elements that contribute to the output and outcomes, the perceived benefits of these initiatives, and alternative healthcare funding models. To our knowledge, all these components have not been studied in combination before. Therefore, four interrelated and successive research questions have been formulated:

1. What are the short- and long-term outcomes of low SES citizens' participation in care–PA initiatives in terms of health, quality of life, and participation?
2. What are the effective elements contributing to the (expected) outcomes of care–PA initiatives?
3. What are the direct and perceived societal costs and benefits of care–PA initiatives?
4. What funding method is most adequate for strategies that provide integrated care, prevention, and PA at neighbourhood level?

Methodological design

Design
The study will be built on a mixed-methods design, i.e., a combination of quantitative and qualitative research methods, involving action research, a participatory process in which reflection results in action based on practical solutions [36]. Data will be collected in multiple rounds at the individual, group, professional, and municipal (including neighbourhoods and health insurers) level, through body measurements, questionnaires, focus groups, in-depth interviews, concept mapping [37], logic models [38], local public health capacity mapping [39], effectiveness arena [40], and the timeline method [41]. The body measurements and questionnaires will be administrated longitudinally, with a baseline measurement (t_0) and two post-tests at three months (t_1) and 1 year (t_2). For the analysis of healthcare costs, a before-after design will be used, as participants' data on healthcare consumption before the initiative started is available.

Multiple cases, i.e., five neighbourhoods in two municipalities, will be investigated within their real-life context. The individual case descriptions of the municipalities and neighbourhoods will enable a cross-case analysis to create more robust evidence than can be provided by a single case study [42]. The combination of information from multiple sources (e.g., policies, neighbourhoods, initiatives, different stakeholders' perspectives) and multiple methods (e.g., body measurements, questionnaires, interviews, focus groups) increases the validity of the study by providing different options for triangulation of information [43].

Stakeholder involvement is key in this study, including citizens participating in care–PA initiatives, professionals from care, PA, and other relevant sectors (e.g., housing, welfare), and representatives from the municipality and neighbourhoods. In addition, regional and national organisations will participate in this study. For example, health

insurers will participate as they support (financially) the care–PA initiatives in both municipalities, the Royal Dutch Society for Physical Therapy (KNGF) supports the collaboration of physiotherapists with other professionals in care–PA initiatives, and NLactief, the Dutch branch organisation for sport and PA centres, supports people with a chronic disease to become physically active in the neighbourhood.

Conceptual model

In order to facilitate and evaluate care–PA initiatives comprehensively, Jolley's conceptual model for community-based health promotion (CBHP) [44] will be used (Figure 2.1). Jolley's CBHP model can be seen as a helpful framework for designing the evaluation of complex CBHP programmes like care–PA initiatives [44]. An important principle in the model is the ecological perspective, which assumes that there are multiple levels of influence on health (intrapersonal, interpersonal, organisational, community, physical environment, and policy level) and that an individual's health status and health-related behaviours are shaped by a dynamic interaction with the physical and social environment [24, 45]. This dynamic interaction between different levels makes the evaluation of interventions like current care–PA initiatives rather complex. To deal with this complexity, the CBHP model proposes that the different phases of a CBHP programme (i.e., planning, implementation, evaluation) be conducted in a non-linear (iterative) manner. The planning phase should yield a programme theory and logic model about how a programme is expected to work and what it will achieve. A programme theory encompasses the assumptions of involved actors, explaining how they expect the programme to achieve the desired outcomes [46, 47].

Based on programme theory, a logic model was constructed through group meetings in two municipalities with stakeholders and citizens prior to the start of this project (Figure 2.2). The logic model functions both as a collective guide to plan and develop strategies and as a way to (scientifically) underpin and evaluate those strategies [38]. After the planning phase, the implementation phase should start with a more locally specific programme theory and logic model, taking context and resources into account. Next, the evaluation phase should aim to include the perspectives of different stakeholders, thereby being participatory. Rapid feedback from and to stakeholders should enable them to make changes to the programmes immediately (action research). Jolley stresses that, during all three phases, the local context of CBHP programmes (e.g., geographical area, economic/political factors, and so on) should be taken into account and that changes in the context should be recognised and acted upon.

Figure 2.1 Jolley's conceptual model of community-based health promotion [44]

HiAP, Care-PA initiatives

Input

Policy and practice:
Efforts to create HiAP
Support for connecting care and PA Leadership
Capacity
Budget
Training
(New) activities

Research
Capacity (PhD, researchers, students)
Knowledge
Methods and tools to facilitate and evaluate policy and practice

Local context
Trends, national and local developments
National policy and politics
Municipal policy and politics
Demography Economy
Social Environment
Physical environment
Current activities (e.g. Sportimpuls)
Capacities, skills, and willingness of municipality, organisations, professionals and citizens

Output

Municipality
Insight into action elements
Advocacy for health
Awareness
Intersectoral collaboration:
• more intense
• more stakeholders

Care-PA initiatives
Intersectoral collaboration
• more intense
• more stakeholders
Referral of citizens
Increased PA offer
Increased number of participants
Insight into action elements

Citizens
Participation in activities
Satisfaction and pleasure
Insight into action elements

Short-term outcomes

Municipality
Community participation
Format for collaboration
Social networks
New or extended facilities
New initiatives (spin-off)
Format for funding model

Care-PA initiatives
Format for collaboration
New initiatives (spin-off)
Social support and active participation within the care-PA initiatives
Format for funding model

Citizens
Self-management
Health literacy
Lifestyle changes
Participation in other activities

Long-term outcomes

Municipality
Social cohesion and capital
Less absenteeism
Less health inequities
Reduction health care costs
Implementation of alternative funding model
Maintenance (see below)

Care-PA initiatives
Maintenance including
• municipal HiAP
• training and funding model
• funding model
• facilitation and evaluation

Citizens
Health (e.g. BMI, fitness)
Quality of life
Societal participation
Equal chances on health
Less care consumption

Developing, implementing and maintaining HiAP and care-PA initiatives
Facilitating and evaluating integrated health policy and care-PA initiatives

Figure 2.2 Logic Framework HiAP and care-sport initiatives

Study setting

The study will be conducted in and with Arnhem (155,699 inhabitants in 2017) and Veenendaal (64,273 inhabitants in 2017), two cities located in the centre of the Netherlands. This research focuses on deprived areas in Arnhem (Malburgen, Presikhaaf/Het Broek, Geitenkamp, Klarendaal) and Veenendaal (to be determined) that are characterised by an overrepresentation of socially vulnerable groups that are less physically active and score lower on quality of life compared to citizens in other neighbourhoods [48, 49].

Both cities are developing and implementing HiAP. In Arnhem, HiAP is based on a needs assessment among citizens in different neighbourhoods and aims to support care–PA initiatives targeting socially vulnerable groups [50]. 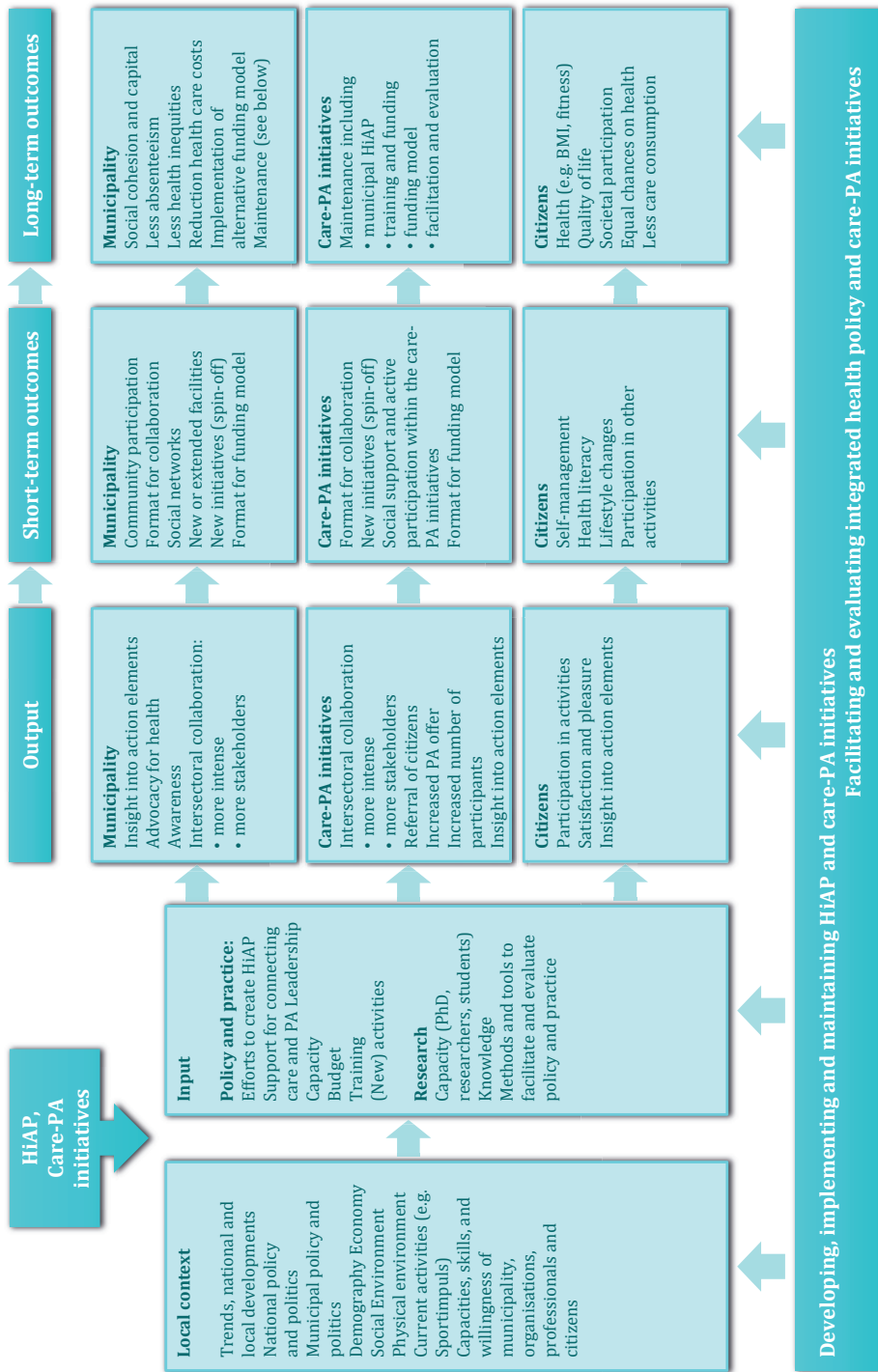Action plans to improve the quality of life in neighbourhoods have been developed, based on a so-called new integrated neighbourhood approach, thereby focusing on, among other things, joint (care) initiatives by citizens, social cohesion, citizen participation, and lifestyle coaches who guide citizens towards a healthier lifestyle, with a focus on PA [51]. Veenendaal aims to increase citizen participation, provide accessible and tailored facilities at neighbourhood level, and shift the focus from cure to prevention [52].

In both municipalities, collaboration between professionals, including primary care, is one of the main strategies. Also, both municipalities have several sport and PA facilities and initiatives, including a specialised PA centre in three deprived areas in Arnhem and one deprived area in Veenendaal, offering PA in combination with education on healthy lifestyles and social activities by a multidisciplinary team. One of these care–PA initiatives is X-Fittt (eXtra Frequency Intensity Training Time Transformation) 2.0.

X-Fittt 2.0

X-Fittt 2.0 is a care–PA initiative for people with a minimum income that focuses on improving participants' lifestyle and health. X-Fittt 2.0 is a combined lifestyle intervention, as multiple lifestyle behaviours, PA, and nutrition are addressed.

Inclusion criteria for participation in X-Fittt 2.0 are having health insurance based on a minimum income via the municipality; having a BMI≥25 (kg/m^2); being≥18 years of age; and being motivated to partly pay for PA after the first phase of the programme.

X-Fittt 2.0 lasts 2 years (Table 2.1). In the first 12 weeks, participants are guided to live healthily by group sports sessions twice a week and an individual sports session once a week, dietary advice by a dietitian, consultations with a physiotherapist, and lifestyle coaching by a lifestyle coach. After that, participants are encouraged to remain physically active by receiving lifestyle coaching for the remainder of the 2 years. Participants are regularly monitored on improvement in weight, BMI, waist circumference, fat percentage, and VO2max by a physiotherapist.

X-Fittt 2.0 seems to be promising, based on a pilot study conducted in 2016 in Arnhem with 58 participants. Short-term outcomes indicate that, on average, participants lost 6.7 kilos of body weight during the first three months, and their self-perceived health status improved from 6.0 to 7.3 (scale: 0–10). In addition, participants stated that their fitness improved and that their self-esteem increased [53]. Based on the

successes so far, X-Fittt 2.0 will be continued in four neighbourhoods in Arnhem and in one neighbourhood in Veenendaal in 2018.

Table 2.1 Overview of X-Fittt 2.0 programme

	Phase 1: weeks 1–12	Phase 2: weeks 13–24	Phase 3: weeks 25–104
Participants	• Start meeting with fittest (running, walking) (week 1) • Participate in sports group twice a week • Independent sports participation once a week	• Continuation of PA, either at the PA centre or at another sports club/association of own choice	• Continuation of PA, either at the PA centre or at another sports club/association of own choice
Lifestyle coach*	• Intake: personal health check, lifestyle**, and development of plan with health and PA goals (week 0) • Evaluation of progress throughout phase 1 • Evaluation at the end of phase 1: discuss results and PA continuation	• Evaluation of lifestyle, PA participation, and PA goals throughout phase 2	• Evaluation of lifestyle, PA participation, and PA goals throughout phase 3 by phone
Physiotherapist*	• Body measurements week 1 (t_0)*** • Body measurements week 12 (t_1)***		• Body measurements week 52 (t_2)***
Sports coach	• Provide training twice a week		
Dietitian*	• Dietary advice, one consultation	• Dietary advice, one consultation	

* The lifestyle coach has 4 hours in phase 1, 2 hours in phase 2, and 2 hours in phase 3 for each participant. The physiotherapist has 2 hours in phase 1 and 30 minutes in phase 3. The dietitian has 1 hour in phase 1 and 30 minutes in phase 2.
** Lifestyle data, which includes data on smoking, alcohol use, PA, employment and voluntary work, loneliness, and stress; data on individual participants' PA goals will be obtained by the lifestyle coach at the intake of X-Fittt 2.0 and during multiple meetings with the participant over the 2 years.
*** Body measurements will be taken as part of X-Fittt 2.0 and include height, weight, BMI, fat percentage, VO2max, blood pressure, waist circumference.

Methods

For each research question, the research activities and tools are explained in further detail in the following sections (Table 2.2). Research activities will be aligned with existing activities when possible. For example, focus group meetings will be organised in combination with meetings that already take place, and questionnaires will be administered simultaneously with other assessment occasions, i.e., the appointment with lifestyle coaches as part of X-Fittt 2.0 (Table 2.2). Furthermore, physiotherapeutic data of intake tests for the programmes will be used to research the impact of care–PA initiatives on the participants. Thus, the generated data will be mutually beneficial and pose a minimum burden for stakeholders and participants, thereby enhancing the efficiency and feasibility of this research. Self-report instruments will be assessed by Pharos (Dutch Centre of Expertise on Health Disparities) to align methods to the language used by X-Fittt 2.0 participants.

Table 2.2 Overview of research activities, tools, and output and outcome measurements at multiple levels

Level	Individual level	Group level	Professional and municipal level
Research question 1	Body measurements* • Height (cm); Weight (kg); BMI (kg/m²); Waist circumference (cm); Fat (%); VO$_2$max; Blood pressure (mmHG) Questionnaires* • Demographics (country of birth, education, household composition, income); Lifestyle (smoking and alcohol); Quality of life (EQ-5D-3L, EQ-VAS); Diseases and healthcare utilisation; Monitoring of PA; Societal participation (USER-P); Appreciation of professional guidance; Appreciation of PA in group In-depth interviews • PA maintenance; Motivation; Societal participation; Appreciation of X-Fittr 2.0; Appreciation of professional guidance; Appreciation of PA in group	Focus groups (APEF tool) (t$_1$ and t$_2$) • PA maintenance; Motivation; Societal participation; Appreciation of X-Fittr 2.0; Appreciation of professional guidance; Appreciation of PA in group	Concept model and logic model (see research question 2)
Research question 2	In-depth interviews (see research question 1)	Focus groups (see research question 1)	Concept mapping and logic model • Literature research • 2 brainstorming sessions • 5 interviews with HiAP experts • Discussion in follow-up meetings Local capacity mapping • Interviews with professionals • Workshops in each municipality (Timeline technique)
Research question 3	X-Fittr 2.0 participants will be invited to effectiveness arenas		Direct costs analysis • Description of costs and benefits • Estimation average costs per activity • Healthcare consumption Perceived benefits and costs • 5 focus groups (effective arena)
Research question 4			Alternative funding model • Literature research to identify models • 2 expert meetings to choose model • 2 workshops (in each municipality)

* Data collection for body measurement and questionnaires will be conducted for each group at t$_0$ (start of X-Fittr 2.0), t$_1$ (12 weeks after the start of X-Fittr 2.0), and t$_2$ (1 year after the start of X-Fittr 2.0). Body measurements will be taken by the physiotherapist as part of the X-Fittr 2.0 programme. All other data will be collected by the researchers.
Abbreviations: EQ-5D-3L EuroQol 5-Dimensions 3-Levels, EQ-VAS EuroQol visual analogue scale, APEF Activate Participation, Enjoyment, and Fostering group processes, USER-P Utrecht Scale for Evaluation of Rehabilitation-Participation

Research question 1: Outcomes in terms of health, quality of life, and societal participation

To assess the outcomes of low SES individuals' participation in X-Fittt 2.0, body measurements, information on lifestyle and PA, and questionnaires will be used as part of a pre-test/post-test design. This will be administered at the start of the programme (t_0), after three months (t_1), and after one year (t_2). Furthermore, focus groups and interviews will be conducted to gain in-depth insight into the short-term and long-term outcomes on health and societal participation.

Body measurements, lifestyle and PA

Body measurements include height, weight, BMI, fat percentage, VO2max, blood pressure, and waist circumference and will be measured by a physiotherapist as part of X-Fittt 2.0. Height is measured to the nearest 0.1 cm with a measuring tape, and weight is measured to the nearest 0.1 kg. Participants are measured with light clothing and no shoes. BMI scores are calculated based on height and weight. Waist circumference is measured with a measuring tape to the nearest 0.1 cm. Fat percentage is measured by measuring skin fold thickness (biceps, triceps, subscapular, suprailiac) using the Slim Guide Skinfold Caliper C-120 [54]. VO2max is measured with the Åstrand/Ryhming cycle test and a heartrate monitor chest strap [55], and blood pressure is measured with a sphygmomanometer.

Questionnaires

The standardised questionnaire topics to measure short- and long-term outcomes are demographics, lifestyle, quality of life, diseases and healthcare utilisation, monitoring of PA, motivation, societal participation, appreciation of the professionals, and appreciation of PA in a group.

Demographic information about participants will be obtained by questions on age, sex, country of birth, highest level of education completed, present household composition, main daily activities (e.g., work, volunteering, housekeeping), and income. Data on sex, country of birth, highest level of education, and income will be collected only at t_0.

Lifestyle is assessed with four questions: two about smoking behaviour (yes/no and number of cigarettes each day) and two about alcohol use (yes/no and number of glasses each day/week/month).

To measure health-related quality of life, the Dutch EuroQoL 5 Dimensions 3 Level scale (EQ-5D-3L) and the EQ visual analogue scale (EQ-VAS) will be used. The EQ-5D-3L is a standardised measure of health status that provides a simple, generic measure of health [56]. The EQ-5D asks respondents to describe their health in terms of the level of problems (no, some, or extreme) on each of the five dimensions: mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. To make the questions more suitable for our study population, the formulation of the questions and answer options have been adjusted to meet the level of the participants in collaboration with, and as suggested by, Pharos. The EQ-VAS is a vertical visual analogue scale that takes

values between 100 (the best imaginable health) and 0 (worst imaginable health) on which respondents provide a quantitative assessment of their health [56]. The scale was changed to a horizontal scale, as suggested by Pharos.

Disease and healthcare utilisation will be measured by questions about diseases in a certain period (depending on whether the questionnaire is filled out in t_0, t_1, or t_2), medicine intake, contact with general practitioner, and contact with other care providers that are not connected to X-Fittt 2.0.

Participants will be asked to indicate whether or not they monitor their own PA behaviour; and, if they do so, they have to indicate how they monitor this.

To measure and to unravel the influence of care–PA initiatives on societal participation, first the concept of participation has been further operationalised based on the participation wheel [57] and scientific literature [5, 19, 58–60]. Social levels of participation include for example 'interacting with others, doing an activity with others, helping others, and contributing to society' [60, p. 2148]. The participation wheel, developed in the Netherlands to guide promotion of participation and associated legal frameworks, also shows several dimensions of societal participation, ranging from employment, volunteering, and caring for others to meeting with others and being able to self-manage life [57]. Second, based on this conceptualisation of participation, the Utrecht Scale for Evaluation of Rehabilitation-Participation (USER-P) [61] has been selected as a measurement instrument, as this fits best the operationalised dimensions. The USER-P is a generic and valid instrument to rate objective and subjective participation in persons with physical disabilities with a good responsibility compared to other participation measures [62, 63]. The original questionnaire consists of three parts: time spent on, and frequency of, daily activities, like working, studying, household, and going out; restrictions in daily activities; and satisfaction with daily activities [61]. For the purposes of this study, only part 1 and part 3 are included in the questionnaires. In part 1 of the original set of questions, six answer options are provided to indicate the frequency of the different daily activities in the previous four weeks. On Pharos's recommendation, this has been decreased to four answer options (every day, a few times a week, once a week, never) to indicate the frequency of the different daily activities over a regular week in our questionnaire, to fit the participants' level. Part 3 originally consisted of six answer categories to indicate satisfaction with different daily activities. This has been narrowed down to four answer categories (I am happy; I do not care; I am unhappy; not applicable) in our questionnaire.

Questions about appreciation of the lifestyle coach, physiotherapist, dietitian, and physical exercise trainer will be asked to measure the appreciation of professional guidance in the programme (3-point scale: good, normal, and bad). For each professional, there is space for adding the reason for the level of appreciation. These questions will be asked only at t_1 (for all professionals) and t_2 (only for the lifestyle coach), as the participants do not yet have experience with the programme at t_0.

Finally, appreciation of PA in a group will be measured by five items on a 3-point scale, covering enjoyment, motivation, appreciation, and influence of the group, and

exchanging experiences. This will be measured only at t_1, as PA in the X-Fittt 2.0 group stops after t_1.

Sample size and power

The impact of X-Fittt 2.0 on physiological and self-report measures will be assessed by means of a one-group pre-test/post-test design. Because participants cluster within different X-Fittt 2.0 groups that cluster within different municipalities, multilevel analysis will be used to analyse the data. Sample size calculation for multilevel modelling is complex however, and estimates derived from available software tend to have limitations [64]. Because the primary aim of our research is to measure effects at the participant level, which makes the number of participants key to obtain sufficient statistical power, it was decided to conduct a power analysis based on a relatively simple paired sample t-test. The power calculation was based on the weight variable, as weight loss is a primary outcome of X-Fittt 2.0 and inclusion is based on BMI. Estimation of effect size was based on pilot data from X-Fittt 2.0 (n=36), which revealed that, on average, participants lost 6.7 kilos of body weight (SD = 4.9) during the first three months of the programme [53]. The sample size calculation was conducted with G*Power version 3.0.10 with alpha set on 0.05, a power of 0.80, and a rather conservative effect size of 5 kg with a standard deviation of 5. This led to a required sample size of 8. Given the drop-out rate of 26% in the pilot programme X-Fittt 2.0 [53] and a drop-out rate of 40% in a Dutch community-based PA programme also targeting socially vulnerable groups with four measurements (drop-out rate 40%) [65], a drop-out rate of 40% is assumed. The required number of participants to obtain reliable estimates of mean weight loss is therefore 14. On average, X-Fittt 2.0 groups consist of 10 participants. The aim is to include at least 15 X-Fittt 2.0 groups across the five neighbourhoods, resulting in a total final sample of at least 90 participants.

Focus groups and in-depth interviews

The short-term and long-term impact of X-Fittt 2.0 will also be assessed by means of focus groups (t_1, t_2) and in-depth interviews (t_2) with X-Fittt 2.0 participants. Topics to be addressed in the focus groups and in-depths interviews include PA maintenance, motivation, societal participation, effective elements (to be identified in research question 2), and appreciation of the X-Fittt 2.0 programme, professionals' guidance, and doing PA in a group.

Statements in focus groups and items in interviews on societal participation will be based on the operationalisation of societal participation as explained before. Statements and items about motivation will be based on the Integrated Change (I-Change) model, derived from the attitude–social influence–self-efficacy model, which can be considered as an integration of various theories [66]. The I-Change model states that behaviours are determined by a person's motivation or intention to carry out a particular type of behaviour. Three main types of factors determine a person's motivation: attitudes, social influences, and self-efficacy expectations.

For the focus groups, the Activate Participation, Enjoyment, and Fostering (APEF) group processes tool [23, 67] will be used. Existing statements in the tool will be adapted or replaced to fit operationalisations of PA maintenance, societal participation, main types of factors of the I-Change model, and appreciation of X-Fittt 2.0, professional guidance, and PA in a group. The APEF tool was originally developed to assess participants' perceptions on group-based principles for action and consists of statements on which participants in groups vote, followed by an in-depth discussion. The voting procedure engages participants, and spider diagrams visualise participants' perception of the statements. The APEF tool addresses the challenge of relating group level outcomes to individual outcomes such as PA behaviour and motivation. The tool facilitates as well as evaluates group-based principles for action, it stimulates dialogue and is culturally sensitive, but it needs strong facilitating skills to manage group dynamics [67].

Focus groups will be held with all X-Fittt 2.0 groups participating in the research. Inclusion of all X-Fittt 2.0 groups in focus groups stimulates participation and might contribute to participants' motivation to continue PA in groups.

Topics in the in-depth interviews will be addressed by open questions in order to explore participants' perceptions and experiences. Interviews will be conducted with four to six participants from each group to get a broad and complete insight into perceptions and experiences while also being able to get insight into differences between groups, neighbourhoods, and municipalities.

Focus groups and interviews also contribute to the identification of effective elements (research question 2).

Research question 2: Identification of effective elements

The effective elements concept refers to the assumption that the effectivity of an initiative is caused by multiple elements. Effective elements can be further distinguished into elements that comprise the core of the initiative, core effective elements, and elements that are more context-specific, specific effective elements [68, 69]. In this study, both core and specific effective elements will be unravelled. Concept mapping, logic models, and capacity mapping are promising tools to deal with complexity and to gain insight into effective elements at the municipal level. Effective elements within groups will be explored by analysis of the focus groups and interviews with X-Fittt 2.0 participants (see also research question 1).

Concept mapping and logic model to conceptualise effective elements

Concept mapping will be used to conceptualise and visualise effective elements by generating, structuring, interpreting, and utilising statements in the form of a concept map [37]. Concept mapping is a standardised tool for developing a conceptual framework of a complex topic and has already been used for a wide variety of subjects, including health promotion [37, 70]. The logic model will be used to operationalise and map the effective elements in relation to input, output, and outcomes [38].

Effective elements will be operationalised and identified in four steps. First, literature research (journal articles, grey literature) on (indicators of) effective elements and input,

output, and outcome indicators will be identified and formulated into statements and included in a provisional logic model for each municipality, based on the overall logic model for the project (Figure 2.2). Second, in each municipality, statements and the provisional logic model will be discussed and adapted through brainstorming sessions with local stakeholders at regular meetings (existing or organised by the project) and, third, through interviews with five national experts in HiAP and/or care–PA initiatives. Finally, in a follow-up meeting, results will be shared with stakeholders, and subsequent actions for policy and practice will be discussed in each municipality.

Local public health capacity mapping
Public health capacity encompasses the organisational, human, financial, and other resources that enable action to be taken by responsible authorities to improve health and reduce health inequalities [71]. Capacity mapping is a tool that can be used to identify these resources. However, there is as yet no consensus on the main dimensions of public health capacity [72]. In previous research, a capacity mapping framework for the work of Care Sport Connectors was developed [39] based on Aluttis et al.'s country level framework for public health capacity [72], Meyer et al.'s conceptual model for public health systems and services research [71], and Bagley and Lin's rapid assessment tool for public health system capacity [73]. In this project, the framework will be further adapted to the local context, and the focus will be broadened to include not only public health capacity but also capacity delivered by other sectors. To map local capacity for public health, prevention, and care–PA initiatives, and to observe potential change over time, interviews with professionals in the care–PA initiatives and municipal sectors will be conducted in 2018 and 2020. In addition, group level techniques for assessment will be used in order to document the collectively experienced benefits. In 2018 and 2020, workshops, as part of regular meetings with municipal stakeholders, will be organised to discuss local capacity for public health, prevention, and PA promotion. In 2020 also, a timeline technique [41] will be used as a reflective tool to provide a comprehensive, historical, and context-specific understanding of developments in policy and care–PA initiatives in both municipalities.

Research question 3: The direct and perceived societal costs and benefits of care–PA initiatives

The rationale for studying the actual and perceived societal costs is to find and document justification for a certain project. Justification is derived when all expected benefits, costs, and alternative options have been carefully considered and prove supportive of the proposed project, i.e., X-Fittt 2.0. The focus in this study will be on direct and perceived costs and benefits. Indirect costs, for example costs that have been incurred for infrastructure and collaboration by different sectors, which function as a prerequisite for care–PA initiatives, are sunk costs that cannot be retrieved. Direct costs are costs incurred to implement the programme, for example treatment of patients by primary care professionals or referral to, and treatment by, secondary care, but also intake at a sports facility.

Direct costs, in terms of benefits and cost savings, will be calculated largely by using existing data (e.g., data from Statistic Netherlands (CBS) and claims data from healthcare insurance companies). This cost analysis will be based on two elements: a description of the average HiAP and care–PA pathway, i.e., the bundle of activities undertaken for HiAP and care–PA initiatives, and estimation of average costs per activity, based on the Dutch guidelines for economic evaluations in healthcare [74]. Measuring benefits in terms of cost savings is based on the assumption that HiAP and care–PA initiatives will cause less healthcare consumption in both the primary and the secondary care sector in the long run.

Administrative claims data from healthcare insurance companies at two points in time (before-after design) of X-Fittt 2.0 participants will be used in order to compare healthcare consumption before and after participation in X-Fittt 2.0. To maintain anonymity and to take into account the privacy regulations, data on healthcare costs will be sent to a trusted third party (TTP). This TTP will combine the health insurers' data with data collected by the researchers of this project and provide us with an anonymised dataset that we can use to answer the third research question. All participants will be asked for written consent to use their claims data.

Perceived costs and benefits will be assessed by an effectiveness arena as this can add a richer and fuller understanding to the hard figures of costs and benefits of care–PA initiatives. The Dutch *EffectenArena* [75] is a tool designed and validated in practice to obtain, with stakeholders, a better insight into the value of societal programmes. The tool has proved useful in joint decision-making processes because it helps to make explicit the expectations that individual partners hold towards the effects of a programme and the specific actions that lead to these effects. By sharing and discussing these thoughts, stakeholders gain new insights. In 2020, in each of the five neighbourhoods in the two municipalities, stakeholders and citizens (X-Fittt 2.0 participants) will be invited to a focus group discussion in which they will be challenged to make explicit connections between the actions undertaken as part of HiAP and care–PA initiatives and the societal effects that they have in mind.

Research question 4: The most adequate funding method for integrated care, prevention, and PA at neighbourhood level

Recently, there has been much debate on the best ways to fund healthcare. Originally, FFS dominated the spectrum. However, several disadvantages have been reported [34]. One important disadvantage is that FFSs incorporate the incentive for healthcare professionals to do more: more healthcare generates more income for them. Hence, citizens are not encouraged to take care of themselves, live healthily, and try to avoid healthcare consumption . Therefore, alternative forms of funding have been proposed. In the US for example, experiments have been conducted with accountable care organisations that were funded depending on the health of 'their citizens.' In Germany, the Gesundes Kinzigtal experiment did the same; and, in the UK, healthcare commissioning groups are going in the same direction. Population-based funding has one essential feature: possible savings – because people become healthier and healthy

people use less healthcare – must be shared between purchasers/payers and healthcare providers: so-called shared savings constructions. Otherwise, the incentive that should encourage providers to innovate will not function.

In this study, following on from the literature, we will elaborate further on existing and new funding models. For example, the OECD proposes three innovative funding methods that can lead to more efficiency in healthcare, cost reduction, and improved quality of healthcare [32]: i) population-based payments, in which a group of healthcare providers provides high-quality healthcare, while keeping the costs below a certain benchmark; ii) add-on payments, in which payments complement existing funding methods, for example 'pay-for-performance', which are add-on payments promoting prevention and meeting certain performance measures; and iii) bundled payments in which multiple services for a certain condition (e.g., diabetes) are grouped together for payment [32]. Next, in two expert meetings, we will rank alternative funding models based on criteria in discussion with the stakeholders, in particular healthcare insurance companies. Finally, we will select one preferred alternative funding model and discuss this model in a workshop in each municipality with local and national stakeholders and list the (evidence-based) benefits and challenges of the chosen alternative funding methods, resulting in recommendations for implementation.

Data analysis
Quantitative data derived from the body measurements and questionnaires will be analysed using R packages on the basis of descriptives (e.g., means and frequencies), t-tests, or – in the event of skewed data distributions – non-parametric alternatives, and by multilevel techniques.

Qualitative data, focus groups, (in-depth) interviews, brainstorming sessions, discussion meetings, workshops, expert interviews, and meetings will be recorded and transcribed verbatim. Data will be analysed using Atlas ti.8 software. The transcriptions of all qualitative data will be coded by two researchers. Discrepancies will be discussed until agreement is reached. Different analysis techniques will be applied, depending of the nature of the data. For example, the in-depth interviews to explore participants' perceptions will be analysed inductively.

In order to gain a comprehensive and contextual insight into what works and why, realist synthesis [46] will be used to identify key combinations of contextual factors and mechanisms that trigger outcomes of interest. A realist synthesis starts with an account of processes that explains how a programme leads to a particular outcome. The focus is on context–mechanism–outcome (CMO) configurations. For instance, the analysis of qualitative data from interview transcripts may be based on coding in terms of 'outcomes as observed by respondents,' 'context conditions', and 'underlying mechanisms – or effective elements – in the actual programme.' The final research output from realist synthesis is not a statement of effect size, as the same programme will have different effects in different contexts, but a refinement of the programme theory. Previous use of realist synthesis in the project Communities on the Move provided a rich and detailed understanding of mechanisms at programme level [76].

Discussion

Health inequalities between low and high SES citizens continue to exist in the Netherlands. As low SES citizens constitute a vulnerable group in society, evidence-based strategies are needed to improve their health and to reduce health inequalities. This fits with the goals of Dutch national health policy, which aims to increase citizen participation [11] and connect and provide care and PA in the neighbourhood [10]. The aim of the study described in this protocol is to gain a comprehensive and contextual insight into what works why in relation to HiAP and care–PA initiatives that aim to promote physical activity among citizens with low SES and to reduce health inequalities. The project will be conducted in Arnhem and Veenendaal, two municipalities in the Netherlands that aim to improve the health of low SES citizens and support care–PA initiatives targeting socially vulnerable groups from a bottom-up point of view.

HiAP and care–PA initiatives have been implemented relatively recently, and consequently little research has been conducted to evaluate them comprehensively. Therefore, a multi-case and multi-methods design is proposed. We will follow deprived areas over time in their real-life context, and therefore the research can be viewed as a natural experiment. Monitoring real-life interventions, however, also imposes challenges for evaluation, as traditional research criteria, such as objectivity of the inquirer, systematic rigour of fieldwork procedures, and generalisability of findings, are not easy to apply. Furthermore, dropouts from a care–PA initiative are hard to follow up, as found during the pilot study.

What adds to the complexity is that we aim to analyse relevant processes and outcomes, at multiple levels, not in isolation, but in connection with one another. This is challenging. However, certain strategies are foreseen that will assist the data analysis. First of all, the logic framework that will be (further) developed for this research will help to identify and define processes and output and outcome indicators at different levels, and hence help to gain and retain a clear view of the project. Second, action research will be a prominent strategy and will be used to engage different stakeholders, including socially vulnerable groups, in order to stimulate change to improve practice and to contribute to generating an evidence base of what works why in a real-life setting [19]. Engaging stakeholders improves the external validity of the research, that is, its applicability and usability in other settings [19, 36]. Furthermore, the value of action research is that it reflects the values of health promotion, such as participation and empowerment [77], enables those involved to continually optimise their strategies, and contributes to (further) developing theories and (other) research methods [19]. Finally, constructivist evaluation criteria will be used in developing our methods for quantitative as well as qualitative data collection, such as acknowledging subjectivity, capturing and respecting multiple perspectives, doing justice to the integrity of unique cases, contributing to deepening understanding of dialogues, and engaging those with less power respectfully and collaboratively.

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Chapter 3

Intermezzo: from study protocol to research practice

Lisanne Sofie Mulderij

Introduction

Research conducted in a real-life setting in and with practice is prone to changes [1]. The involvement of many different stakeholders who may influence and change the context makes it difficult to control the research. In addition, new insights might raise new questions or change the way we look at our research. This chapter describes the adaptations we made to our research design and data collection as proposed in our research protocol (Chapter 2). Examples of such adaptations are changes in research questions or changes in the care-physical activity (care–PA) initiatives we studied, as well as smaller changes such as the measurements that were taken from the participants. We will describe these changes for each research question of the study protocol separately (Table 3.1).

Table 3.1 The research questions as proposed in the study protocol, the type of change that was made and the adapted research questions as studied in this thesis.

Initial research question	Type of change	New research question(s)
What are the short- and long-term outcomes of low socioeconomic status (SES) citizens' participation in care–PA initiatives in terms of health, QoL, and participation?	• Change of focus → only X-Fittt 2.0 being studied: new research question • Change of research methods → more data collection moments; adaptations in selected body measurements; adaptations to questionnaires; changed type of qualitative data collection	What are the short- and long-term outcomes of participation in X-Fittt 2.0 in terms of health, QoL and societal participation?
	• Additional focus and research activities into the experiences of X-Fittt 2.0 participants → extra research question	What are the experiences of participants in the combined lifestyle intervention X-Fittt 2.0?
What are the effective elements contributing to the (expected) outcomes of care–PA initiatives?	• Change of focus → one study on X-Fittt 2.0, one study on care–PA initiatives for citizens with a low SES: new research questions	What are the effective elements of X-Fittt 2.0, a combined lifestyle intervention for people with low SES? What are the effective elements of care–PA initiatives for adults with a low SES in the Netherlands, based on the experiences of health promotion experts?
What are the direct and perceived societal costs and benefits of care–PA initiatives?	• Change of focus → costs and benefits of care–PA initiatives in terms of healthcare utilisation: new research question	What is the impact of participation in a care–PA initiative on the healthcare utilisation of citizens with a low SES?
What funding method is most adequate for strategies that provide integrated care, prevention, and PA at neighbourhood level?	• Change of focus → perceptions of the general public towards the public funding of care–PA initiatives and other overweight prevention strategies for citizens with a low income: new research question	What are citizen preferences regarding the public funding of projects that promote a healthy body weight among people with a low income and do these preferences differ between people with different incomes? Why do citizens prefer certain projects that promote a healthy body weight among people with a low income over others?

Research question 1

Our (failed) attempt to include multiple care–PA initiatives
At the time of writing the study protocol, we planned to study multiple care–PA initiatives for citizens with a low SES. These initiatives were being prepared in the two Dutch municipalities that we focused on: Arnhem and Veenendaal. However, when the research started, X-Fittt 2.0 in Arnhem was the only active care–PA initiative for citizens with a low SES that combined multiple health behaviours, including PA. It was planned that X-Fittt 2.0 would also be implemented in Veenendaal, but this ultimately did not happen due to political and practical reasons, which hampered our research.

In addition, practice caught up with us during our research, which meant that combined lifestyle interventions (CLIs)–of which care–PA initiatives are an example–started to be included in the basic healthcare insurance scheme from January 2019. As a result, some municipalities near Arnhem started to collaborate with healthcare insurance companies to implement CLIs for citizens with a low SES. We aimed to include these CLIs in our research. However, these municipalities experienced delays in implementation or the CLIs did not get off the ground at all, which made it impossible for us to collect data. Only one of these CLIs actually started and we collected data for one group of 15 participants, but our contact person left the initiative and did not have a successor and data collection stopped. The bits of data that we were able to collect were often incomplete and had missing follow-up data, which is why we decided to exclude these data from our research.

Since X-Fittt 2.0 was not implemented in Veenendaal, we decided to include another health promotion initiative in Veenendaal, namely a walking programme that also included a few informative presentations about health and health promotion by a general practitioner. However, over the course of this programme, the walking programma and X-Fittt 2.0 appeared difficult to compare. Moreover, the walking programme could not be classified as a care–PA initiative, since it mostly consisted of a walking group once a week with no lifestyle coaching. Therefore, we decided to exclude this walking programme from our research.

Luckily, the X-Fittt 2.0 programme continued in Arnhem and, due to the commitment of local stakeholders, another CLI for citizens with a low SES that was rather similar to X-Fittt 2.0 started in Veenendaal. This gave us the opportunity to eventually include nine groups of participants with a low SES (n=208) in our research. The focus thus changed to this specific care–PA initiative. Hence, the research question changed to *'What are the short- and long-term outcomes of participation in X-Fittt 2.0 in terms of health, QoL and societal participation?'*

Changes in measurements
The proposed methods for research question 1 were to conduct body measurements and to take questionnaires at start (t_0), after 12 weeks (t_1) and after one year (t_2). During the first 2 years of this project, it became clear that most studies that followed participants of lifestyle interventions stopped data collection after one or one and a half years [2–4].

However, since X-Fittt 2.0 was a two-year programme, we decided that we would collect data up to 2 years after the start of X-Fittt 2.0.

The selected body measurements in the study protocol were *height, weight, BMI, fat percentage, VO$_2$max, blood pressure,* and *waist circumference.* Most of these measurements were taken during our study. To assess VO$_2$max, there exist maximal and submaximal exercise tests [5]. Maximal tests measures maximum oxygen consumption from exhaled air and are seen as the standard for measuring VO$_2$max, while submaximal tests predict VO$_2$max from measurements of heart rate [5]. Conducting maximal tests is time consuming and invasive, which is why we decided not to use them for our study. However, the submaximal tests were used in the beginning of our study, but still seemed to be too invasive for the majority of our study population, resulting in missing data for the majority of the participants. Therefore, we decided to exclude VO$_2$max measurements from our data collection. Furthermore, fat percentages are not presented in this thesis, because at the different locations were X-Fittt was implemented, different measurement methods were used (skinfold thickness and fat percentage scale), making comparison impossible.

According to the protocol, the questionnaires would focus on *demographics, lifestyle, quality of life, diseases and healthcare use, monitoring of PA, motivation, appreciation of the professionals,* and *appreciation of PA in a group.* However, from the first two participant groups that we studied, it appeared that some of the questions were not clear to the participants. These sets of questions explored the confidence participants had in maintaining PA, and participants' motivation to be physically active. However, the questionnaires were too difficult for the participants to understand, and we could not rely on them being completed properly. Therefore, we decided to remove both sets of questions from the questionnaires after the first two groups. Furthermore, we believed that it would be valuable to add some questions concerning societal participation. Until then, we only asked participants about societal participation in the group discussions and interviews.

Furthermore, we proposed in the study protocol to conduct group discussions at t_1 and t_2 and individual interviews at t_2, asking participants about *PA maintenance, motivation, societal participation,* as well as *appreciation of the X-Fittt 2.0 programme, professionals' guidance, and doing PA in a group.* Ultimately, we conducted group discussions only at t_1, since participants would no longer be part of the group after t_1. Instead, we decided to collect in-depth qualitative data in the long-term as well, so we conducted the individual interviews both at t_2 and t_3. In addition, we also obtained information regarding participants' health during the group discussions and interviews, to obtain a broader picture of the health-related impact of X-Fittt 2.0. Such health-related qualitative data has, to our knowledge, not been collected for care–PA initiatives before, making our study innovative.

The results regarding the *appreciation of X-Fittt 2.0* collected using the group discussions and individual interviews were used to answer an extra research question that was not proposed in the study protocol: '*What are the experiences of participants in the combined lifestyle intervention X-Fittt 2.0?*' (Table 3.1). These results are important for

interpreting the results on the impact on the participants and for informing us on what in the programme worked and what could be improved. Obtaining such information is novel and relevant regarding care–PA initiatives for citizens with a low SES.

Research question 2

From one to two concept-mapping studies
For this research question, we used the method as proposed in the study protocol, namely concept mapping. However, we conducted two studies instead of one: one study focussing specifically on X-Fittt 2.0, and one study focussing on care–PA initiatives for people with a low SES in general (Table 3.1).

Conducting research in and with practice, namely public health practitioners of X-Fittt 2.0 in our first study, resulted in effective elements that could immediately be implemented in practice for improving X-Fittt 2.0. In addition, the experiences of these public health practitioners with X-Fittt 2.0 that led to these effective elements could be valuable for other care–PA initiatives for citizens with a low SES as well.

Moreover, we wanted such knowledge to be put in a broader perspective than just one care–PA initiative. Therefore, we conducted a second study with health promotion experts with different expertise, in which the focus was not on one specific care–PA initiative, but on care–PA initiatives for people with a low SES in general. This second study also contributed considerably to the knowledge on improving care–PA initiatives for people with a low SES.

Research question 3

Measuring impact on healthcare utilisation
From 2019, CLIs, such as care–PA initiatives, were partly covered by the basic healthcare insurance scheme in the Netherlands. Because it was expected that these CLIs would reduce healthcare costs [6], it became relevant to study whether these initiatives actually have an impact on the healthcare utilisation of participants. We had the opportunity to analyse the healthcare claims data of participants of X-Fittt 2.0 as described in the study protocol. Therefore, the focus of this research question changed from societal costs and benefits to a focus on healthcare utilisation, which is why we changed the research question to *'What is the impact of participation in a care–PA initiative on the healthcare utilisation of citizens with a low SES?'* (Table 3.1). Such a study, focusing on the healthcare utilisation of participants in a care–PA initiative for citizens with a low SES, had never been done before, which makes our study unique. The obtained information is relevant for developing of health policies, especially regarding policies that aim to stimulate PA.

Research question 4

Exploring citizen preferences regarding health promotion

Structural funding for providers of care–PA initiatives has been lacking in the Netherlands, which prevented the broad implementation of such initiatives [7]. In 2006, the first plans were made to include prevention of overweight and obesity in the basic healthcare insurance scheme. However, the care related portion of care–PA initiatives was covered by the basic healthcare insurance scheme only from January 2019 onwards [6]. Therefore, the initial research question as proposed in the study protocol became less relevant. The inclusion of care–PA initiatives in the basic healthcare insurance scheme meant that all Dutch citizens would indirectly pay for people to participate in care–PA initiatives via premiums and taxes, even though not all citizens would participate themselves. These changes raised a new, more relevant question, namely whether the Dutch population supported this policy change and which kind of health-promoting projects they would like to see funded to improve the health of citizens with a low SES. Therefore, we decided to adapt the research question to '*What are citizen preferences regarding the public funding of projects that promote a healthy body weight among people with a low income and do these preferences differ between people with different incomes?*' (Table 3.1). To answer this research question, we used a participatory value evaluation (PVE), which puts citizens in the shoes of a policymaker. Exploring citizen preferences using a PVE has been innovative in the field of health promotion and proved a useful tool to provide insights into citizen preferences for the health domain. The obtained information could inform policymakers when making decisions regarding budget allocation for health promotion.

Conclusion

We made several adaptations to the proposed study protocol, which were either necessary or desirable because we conducted the research in a real-life context. Because data were mostly collected in one city, the focus of the research shifted away from a comparison at the municipal level towards a more detailed evaluation of one specific care–PA initiative (X-Fittt 2.0): the impact of the programme on several health(care) outcomes, insight into the effective elements of this initiative and experiences of participants with the programme. In addition, the focus also shifted to a more national level, with health promotion experts participating in a study regarding the effective elements of care–PA initiatives for citizens with a low SES in general and with the general Dutch population indicating their preferences regarding health promoting projects. Although we could not realise all initial plans, we conducted relevant studies and used innovative methods, such as the PVE. Our studies provided valuable insights into care–PA initiatives for citizens with a low SES that can be useful for policy and practice.

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Chapter 4

The positive impact of a care–physical activity initiative for people with a low socioeconomic status on health, quality of life and societal participation: a mixed-methods study

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Maria Koelen, Annemarie Wagemakers

Abstract

Overweight and obesity rates are increasing worldwide, particularly among people with a low socioeconomic status (SES). Care–physical activity (care–PA) initiatives may improve participants' lifestyles and thereby lower overweight and obesity rates. A two-year care–PA initiative specifically developed for citizens with a low SES, X-Fittt 2.0, was offered free of charge to participants, and included 12 weeks of intensive guidance and sports sessions, and 21 months of aftercare. Here, we study the impact of X-Fittt 2.0 on health, quality of life (QoL) and societal participation using a mixed-methods design. Questionnaires and body measurements were taken from 208 participants at the start of X-Fittt 2.0 (t_0) and after 12 weeks (t_1), one year (t_2) and two to three years (t_3). We also held 17 group discussions (t_1, n=71) and 68 semi-structured interviews (t_2 and t_3). Continuous variables were analysed using a linear mixed-model analysis (corrected for gender, age at t_0, height, education level and employment status at the different time points), while we used descriptive statistics for the categorical variables. Qualitative data were analysed using a thematic analysis. Body weight was significantly lower at all three post-initiative time points compared with the baseline, with a maximum of 3.8 kg difference at t_2. BMI, waist circumference, blood pressure and self-perceived health only significantly improved during the first 12 weeks. A positive trend regarding paid work was observed, while social visits decreased. The latter might be explained by the COVID-19 pandemic, as lockdowns limited social life. Furthermore, participants reported increased PA (including sports) and a few stopped smoking or drinking alcohol. Participants mentioned feeling healthier, fitter and more energetic. Additionally, participants' self-esteem and stress levels improved, stimulating them to become more socially active. However, the participants also mentioned barriers to being physically active, such as a lack of money or time, or physical or mental health problems. X-Fittt 2.0 improved the health, QoL and societal participation of the participants. Future initiatives should take into account the aforementioned barriers, and consider a longer intervention period for more sustainable results. More complete data are needed to confirm the findings.

Introduction

Overweight and obesity rates are increasing worldwide [1]. In the Netherlands, the percentage of adults who were overweight increased from 32% in 1990 to 49% in 2015, and these rates are expected to rise in the coming decades [2]. Being overweight or obese is also more prevalent among people with a low socioeconomic status (SES) than for people with a higher SES [3]; for instance, 19.8% of the low-educated Dutch adults were obese in 2015, compared with 'only' 8.4% of the high educated Dutch population [2]. The higher prevalence of obesity might partly explain the health inequalities between people with a low SES and people with a higher SES, both worldwide and in the Netherlands [2–4]. In addition to the difference in overweight and obesity rates, the difference in life expectancy and years in good perceived health is indicative of these health inequalities in the Netherlands; for example, people with a low education level are expected to live 7 years fewer than people with a high education level, and with 18 fewer years in good perceived health [2]. Furthermore, people with a low SES generally score worse for self-perceived health and quality of life (QoL) than people with a higher SES [5–7]. Lastly, the higher prevalence of chronic diseases (e.g., obesity and diabetes) among people with a low SES might also lead to lower societal participation among this group [8]. To tackle this overweight and obesity problem and to reduce health inequalities, care–physical activity (care–PA) initiatives have been developed. The impact of such initiatives on people with a low SES has, however, not yet been studied.

In care–PA initiatives, the healthcare sector and the PA sector work together to improve the health and lifestyle of citizens and to reduce the risk of developing chronic diseases by increasing daily PA and improving dietary behaviours [9, 10]. PA is known to be able to increase fitness, QoL, self-esteem and stress levels; to reduce the symptoms of depression or anxiety and the risk of developing chronic diseases; and to improve social skills, societal participation and employment status [11–14]. However, because people with a low SES experience specific problems, such as stress due to poverty, debts or unemployment, they are often hard to reach [15]. It is therefore crucial to tailor care–PA initiatives specifically to people with a low SES by minimising the barriers to participate in these initiatives, such as language and literacy barriers and financial barriers, and by providing the intervention close to the homes of the participants [16–18]. Furthermore, coaches should use a more personal and intensive (e.g., longer) approach, be committed to the target population and use behaviour change techniques such as goal setting [16–19].

This study evaluates the impact of a Dutch care–PA initiative developed specifically for people with a low SES: X-Fittt 2.0 (Box 4.1). For this initiative, a low SES was determined as an income at or below the minimum wage level and receiving municipal benefits [20]. Our research question was: what are the short- and long-term outcomes of participation in X-Fittt 2.0 in terms of health, QoL, and societal participation? We expected that X-Fittt 2.0 is capable of positively influencing participants' health and QoL by improving their lifestyle. Furthermore, we expected that, because of the positive

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influences on health and QoL, participants will participate more in society (e.g., work, voluntary work or other social activities).

Methods

Data collection

This mixed-methods study evaluated an existing care–PA initiative. The justification for the chosen outcome variables (Table 4.1), which have also been used in other studies evaluating care–PA initiatives [22–25], can be found in our study protocol [9]. We studied nine groups participating in X-Fittt 2.0 (n=208) over a period of five years, from 2016 to 2021 (Figure 4.1). Each group started with the 12-week intensive programme. Questionnaires and body measurements were taken at the start (t_0), after 12 weeks (t_1), after one year (t_2) and after two to three years (t_3) (Table 4.1). The questionnaires were distributed by the lifestyle coaches connected to X-Fittt 2.0, while the body measurements were performed by physiotherapists at the sports centres where X-Fittt 2.0 was conducted. After the first two groups that we studied, we adapted the questionnaires, because it appeared that participants did not understand some of the questions. The problematic sets of questions explored the confidence participants had in maintaining PA and participants' motivation to be physically active but were too difficult for the participants to understand, and we could not rely on them being completed properly. We decided to remove them from the questionnaires and instead added questions concerning societal participation, because these were missing in the first version of the questionnaires. Hence, the data for the outcome variable societal participation were incomplete for the first two groups who underwent X-Fittt 2.0.

X-Fittt 2.0 comprised a two-year programme, but because of the COVID-19 pandemic, measurements at t_3 could not always be taken at the end of the programme. The measurements for group 1 and 2 were taken after 2 years, but the final measurements for the other groups were taken between two and three years after the start of X-Fittt 2.0. All participants were assigned a unique study ID that could only be traced back to the participant by the researchers.

At t_1, group discussions were held with the participants. The topics of these group discussions were participants' health, diet, daily life, motivation, experiences with the group, societal participation and whether the participants would continue to exercise after the first 12 weeks. At t_2 and t_3, we held semi-structured interviews, in which we asked participants about their health, diet, PA and societal participation.

All methods were carried out in accordance with relevant guidelines and regulations.

Table 4.1 Overview of the data collection methods, measurements and number of participants at each time point.

Collection method	Measurements	N			
		t_0	t_1	t_2	t_3
Questionnaire	QoL score and self-perceived health (EQ-5D-3L and EQ-VAS [26]), illness and medicine use, visits to healthcare professionals , monitoring of PA, societal participation (USER-P [27]), smoking and alcohol behaviour, demographic information	144	101	79	42
Body measurements	Height, body weight, body mass index (BMI), fat percentage, waist circumference, blood pressure	169	117	58	38
Group discussion	Health, daily life, societal participation, group experience and group dynamics, motivation, continuation of sports	–	71	–	–
Individual interview	Health, daily life, societal participation, sports participation and PA, nutritional behaviour	–	–	31	37
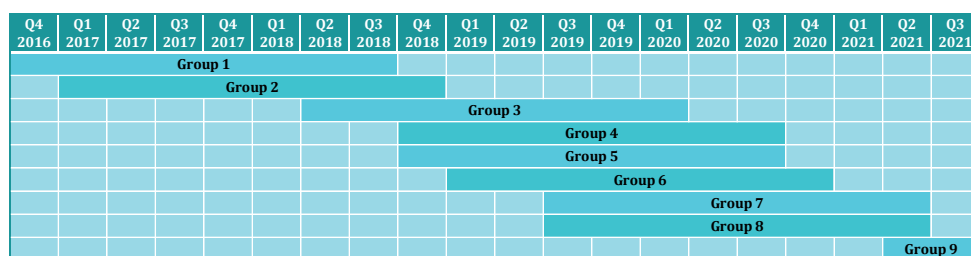
Figure 4.1 Timeline of groups that started X-Fittt 2.0

Data analysis

Body measurements and questionnaires

We used a linear mixed-model analysis with a maximum likelihood estimation to assess the changes over time (repeated measurements) using a first-order autoregressive covariance structure with heterogenous variances. The primary outcomes included body weight, BMI, waist circumference, blood pressure, QoL and self-perceived health. The basic model consisted of an outcome measure, time as repeated measures (first level) and the participants' study IDs (second level) (Figure 4.2). We then step by step included gender, age at t_0, height, education level and employment status at t_0 as second-level fixed factors, and employment status at different time points as a first-level fixed factor. Subsequent models were compared in terms of the likelihood ratio test and Schwarz's Bayesian information criterion (BIC) (Appendix 4.A). Data were included for all participants who finished at least the first 12 weeks of X-Fittt 2.0. We compared all estimated marginal means with the baseline measurements (t_0) and the significance was assessed at a = .05. For categorical variables, we used descriptive statistics, meaning that we calculated frequencies for all time points separately. No statistical tests were performed. All analyses of the quantitative data were performed using IBM SPSS Statistics, version 25.0.
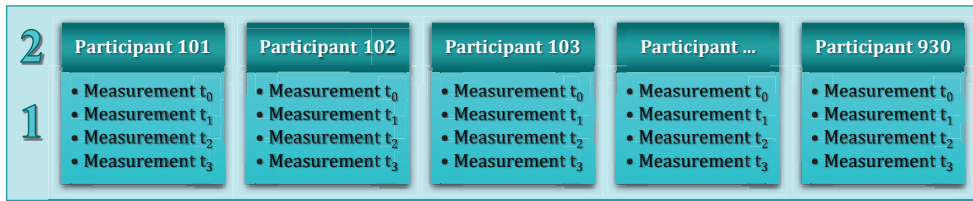
Figure 4.2 The two levels of the multilevel model used in this study.

Group discussions and individual interviews

We conducted a thematic analysis, which consisted of the six steps described by Braun & Clarke (2006) [28]. All steps were conducted separately for the group discussions at t_1 and the individual interviews at t_2 and t_3. After familiarisation with the data (step 1), we inductively generated initial codes by reading the data (step 2). About 50 percent of the data were coded by two (interviews at t_2 and t_3) or three (group discussions at t_1) researchers, after which we discussed the encodings of the different researchers. Because the researchers had coded the data quite similarly, only one researcher coded the rest of the data. After all data were coded, we sorted the codes into potential themes (step 3). We then reviewed the themes by reading the data extracts within each theme (step 4). During this step, some initial themes were merged, and some codes or data extracts were moved to another theme (Appendix 4.B). Also, relevant data extracts that were missed during the initial coding were coded. After that, we defined and further refined the themes and analysed their content by identifying the essence of each theme separately and of all themes together (step 5). This is also the step in which we named each of the three final themes that we developed for both the group discussions and the individual interviews: *'lifestyle'*, *'self-perceived health'* and *'societal participation'*. Finally, we wrote down the results and selected accompanying data extracts to be presented in the paper (step 6). All analyses of the qualitative data were performed using ATLAS.ti, version 9.

Results

Body measurements and questionnaires

Participant characteristics

In total, 181 participants completed at least the first 12 weeks of X-Fittt 2.0, of whom three quarters were women and about 20 percent were educated to a low level (Table 4.2). About one third of the group did not work (paid or voluntary). More than one quarter of the participants were overweight and almost two third of the participants were obese. Twenty-seven participants dropped out during the first 12 weeks or at an unspecified moment later on. The only observed difference between these groups was that, compared with the dropouts, the participant group was slightly more highly educated and more commonly participated in paid or voluntary work.

The main self-reported reasons for dropout were the development of injuries, physical or mental health problems, an intense life event or lack of time (Appendix 4.C). Furthermore, some of the participants could no longer be reached by the lifestyle coaches and were therefore classified as dropout.

Table 4.2 Baseline measurements for participants and dropouts as measured at t_0.

	Participants $n=181$			Dropouts $n=27$		
	n	**Mean (SD)**	**n (%)**	**n**	**Mean (SD)**	**n (%)**
Age (years)	165	48.2 (11.9)		20	44.8 (10.7)	
Gender	179			25		
• Female			128 (71.5)			18 (72.0)
• Male			51 (28.5)			7 (28.0)
Education level[a]	138			16		
• Low			28 (20.3)			2 (25.0)
• Middle			88 (63.8)			11 (68.8)
• High			22 (15.9)			1 (6.3)
Work status	144			18		
• Paid/voluntary work			92 (63.9)			9 (56.3)
• No paid/voluntary work			52 (36.1)			7 (43.8)
Height (cm)	167	168.0 (9.2)		21	169.1 (12.3)	
Weight (kg)	169	92.3 (19.6)		22	96.3 (18.2)	
BMI (kg/m²)	165	32.7 (5.7)		21	33.0 (3.7)	
• Healthy weight			10 (6.1)			0 (0.0)
• Overweight			49 (29.7)			4 (19.0)
• Obese			106 (64.2)			17 (81.0)
Waist circumference (cm)	166	107.8 (15.5)		23	110.2 (12.8)	
Blood pressure (mm Hg)	167			23		
• Systolic		131.4 (18.9)			127.77 (15.5)	
• Diastolic		83.5 (12.5)			80.1 (11.3)	
Self-perceived health[b]	144	6.2 (1.6)		16	6.1 (1.5)	

[a] Low education level: leaving after primary school, preparatory secondary vocational education, senior secondary vocational education level one, or the first three years of senior general secondary education or pre–university education; middle education level: leaving after completing senior general secondary education or pre–university education, or senior secondary vocational education level two, three or four; high education level: completed higher professional education or university [29]
[b] EQ–VAS: scale from 0 to 10 [26]

Physical health and QoL

Eventually, the final model was corrected for gender, age at t_0, height, education level and employment status at different time points (Appendix 4.D). Compared with at the start of X-Fittt 2.0, the participants lost an average of 2.6 kilograms of weight during the first intensive 12 weeks (Table 4.3). After one year, this average weight loss had grown to about 3.8 kilograms. Although the participants gained some weight during the second year of X-Fittt 2.0, they still maintained an average loss of 3.4 kilograms compared with at the start of the initiative. BMI, waist circumference and blood pressure was only

significantly decreased at t_1 compared with at the start. Self-perceived health increased significantly by about 0.6 (on a scale of 0 to 10) during the first 12 weeks. No significant changes were observed for the other variables or for the other time points.

Table 4.3 Estimated marginal means and average changes for the different time points for all outcome measures.

					Participants n=181					
	t_0	t_1	t_2	t_3	$t_1 - t_0$	$t_2 - t_0$	$t_2 - t_1$	$t_3 - t_0$	$t_3 - t_2$
Weight[a]	96.0	93.3	92.2	92.6	− 2.64*	− 3.84*	− 1.19	− 3.42*	− 0.42
BMI[b]	34.0	33.2	32.8	32.9	− 0.85*	− 1.24	− 0.39	− 1.08	+ 0.16
Waist circumference[c]	111.1	107.3	108.5	110.1	− 3.75*	− 2.57	+ 1.19	− 1.02	+ 1.54
Systolic blood pressure[d]	131.2	125.0	130.6	130.4	− 6.25*	− 0.57	+ 5.68	− 0.78	− 0.21
Diastolic blood pressure[d]	83.2	80.3	80.3	81.9	− 2.85*	− 2.84	+ 0.01	− 1.22	+ 1.62
Quality of life[e]	0.68	0.65	0.65	0.63	− 0.03	− 0.03	+ 0.00	− 0.04	− 0.02
Self-perceived health[f]	6.2	6.9	6.5	6.6	+ 0.65*	+ 0.27	− 0.38	+ 0.38	+ 0.11

[a] kilograms; [b] kilograms/m²; [c] centimetres; [d] mmHg; [e] EQ–5D–3L: scale from − 0.33 to 1.00 [26]; [f] EQ–VAS: scale from 0 to 10 [26]; * $p < 0.05$

Societal participation and lifestyle

Regarding societal participation, we saw a trend in the data for paid work (Appendix 4.E). At the start of X-Fittt 2.0, the vast majority of the participants did not have a paid job. At the end of X-Fittt 2.0 (t_3), this was still the case, although a few participants had started paid work or worked more hours per week compared with at the start of X-Fittt 2.0. On the other hand, participants reported visiting others or receiving visitors slightly less often than at the baseline. This could, however, be explained by the COVID-19 pandemic, during which lockdowns have limited social life in the Netherlands.

With regards to lifestyle, over the course of X-Fittt 2.0, the number of participants who did not exercise decreased, while the number of people who exercised regularly increased compared with at the start of X-Fittt 2.0 (Appendix 4.E). For PA in a non–organised sports setting (walking, cycling, etc.), the number of active people had increased, especially at t_1 and t_2, compared with t_0. Furthermore, more people monitored their own PA behaviour (Appendix 4.F). No changes in the use of medicines were observed. A few people stopped smoking or drinking alcohol over the course of X-Fittt 2.0.

Group discussions (GD) and individual interviews (I)

Lifestyle

Participants indicated that they were more aware of healthy lifestyles and healthy nutrition. They watched their diet more and tried to snack less, and the smokers indicated smoking less. *"Yes, now instead of tobacco, I have an e-cigarette, but I am at such a level now that I have almost completely stopped. That is because I am working out here [at the sports centre of X-Fittt 2.0]."* [GD7 – t_1] Furthermore, they had obtained new

knowledge and their mindset had changed, which helped many of them to maintain the healthy lifestyle after the first 12 weeks of X-Fittt 2.0.

Some participants, though, found maintaining a healthy lifestyle difficult. This was especially true for PA, for which they mentioned several reasons. First, a lack of money was seen as a major barrier to continue with sports after the first 12 weeks of X-Fittt 2.0. *"People who have enough money may not understand it. Like 'if you want to work out, just go and work out'. But if you cannot afford it... I really need it [to work out]."* [GD9 – t_1] *"I am paying off debt, so a gym subscription is out of the question."* [I11 – t_3] Second, having to do it on their own, a lack of discipline or having problems picking it up again was mentioned as barrier. *"They closed for a week because new equipment was installed and things changed. Then I could not work out for 14 days, it all went to pot, and at some point I just stopped going."* [GD5 – t_1] Third, a lack of time, for instance due to an increase in (voluntary) work activities, hampered being physically active. *"I really do feel like 'I really want this [to exercise]', but I have a lot of work assignments at the moment and it sort of slips by."* [I10 – t_3] Fourth, the physical and mental health of the participants was perceived as a barrier. *"And my [physical] health is actually deteriorating more and more. More and more complaints, which I didn't have then. So that's why I have done less and less, actually."* [I14 – t_3] *"Psychiatric problems reared their heads and as a result I could not keep that commitment [of exercising]"* [I21 – t_3] Fifth, feeling tired or already having exercised resulted in less PA among participants. *"I used to go walking at the weekend, but now I often think 'I've already done my workout on Wednesday and Thursday', so I'm not going for a walk at the weekend, even though I really enjoy it."* [I9 – t_2] Finally, the COVID-19 pandemic, during which sports centres were closed for a few months, made it difficult for participants to exercise. *"I can't exercise now. Or rather, I don't exercise. I can, but I don't exercise because I'm a bit scared of catching the virus."* [I43 – t_3]

Although some participants had trouble maintaining a healthy lifestyle, a myriad of the participants reported an increase in PA since participation in X-Fittt 2.0. Many of them also mentioned that they did not exercise at all before the start of X-Fittt 2.0. Although some of them continued to exercise at a sports centre or sports club after the first intensive 12 weeks, others stopped doing this. Of this last group, some participants indicated spending their leisure time on more active pursuits. *"I have a dog. Before I started I used to do small laps and now I just walk and then I think 'I can do another lap'. My dog totally loves it. It doesn't take any energy to walk, whereas before it did."* [I7 – t_2] A few participants also mentioned that they had relapsed into less physically active behaviours during the 2 years of X-Fittt 2.0, but that they were able to resume their healthier lifestyle and to be physically active again.

Self-perceived health

Some participants experienced negative effects of participating in X-Fittt 2.0, especially after the first 12 weeks, such as tiredness and injuries caused by sports. At t_2 and t_3, a few participants reported having more physical problems than before the start of X-Fittt 2.0, which they related to exercising. *"But that is the other side of the story. After the fifth group meeting I injured my back. Since then, I have not participated in any groups at [the sports*

centre]. I went through a long process of physiotherapy. [I thought to myself,] 'If only I had not started doing sports, if only I had not joined [X-Fittt 2.0]'." [I30 – t_2] Participants who were less physically active after the intensive first 12 weeks indicated that, after t_1, their stamina decreased and that they had more psychological problems, were more tired, and had gained weight. A few participants mentioned that the COVID-19 pandemic had also played a part in this.

However, the majority of the participants indicated experiencing an improved health status, especially at t_1, but also one to three years after the start of X-Fittt 2.0. For instance, they felt fitter, have more energy and have an improved stamina. *"Yes, I have a 5-year-old daughter. Before I started this, I was exhausted after an hour with her, and now I can spend a whole afternoon with her."* [GD1 – t_1] It was also mentioned that their body measurements had improved (e.g., decreased body weight, fat percentage, abdominal circumference and blood pressure), and that they became stronger and more *in shape*. Furthermore, participants mentioned reductions in the amount of pain and physical problems they experienced, and in their use of medication. *"But when you see that I can now walk 15 kilometres... Last week I went to [my vascular surgeon] for my annual check-up. 'I never thought you would ever manage that with your leg', he said."* [I48 – t_3] Some participants indicated improvements in their mental health, such as experiencing less stress or feeling mentally stronger. *"But also in terms of resilience, I feel strengthened."* [GD7 – t_1] Additionally, improvements in self-esteem were also mentioned by many participants. *"And seeing that you lose weight every week, that you keep to the right eating schedule and so on, that has given me a lot of self-confidence in daily life."* [GD5 – t_1] *"It's more of a general feeling of being more comfortable in my own skin. I did feel really uncomfortable and unattractive ... So that shame is actually gone, and that makes a difference."* [I7 – t_2]

Societal participation

The majority of the participants indicated a positive impact of X-Fittt 2.0 on their daily activities, because they feel fitter and have more energy. For instance, participating in X-Fittt 2.0 gave participants structure in their daily life. A few participants explained that before participating in X-Fittt 2.0, they used to lie on the sofa and they felt socially isolated, but that they are now fitter and therefore more assertive in undertaking activities. *"Wanting more, being able to do more. Before, you had to pull me out of the house, so to speak. Now I am getting out of the house myself, and I come up with things and initiatives."* [GD7 – t_1]. Furthermore, a few participants mentioned that they work more or started working again after a period of not working (both for paid work and voluntary work). An increase in self-esteem and energy levels had contributed to this, according to the participants. On the other hand, some participants mentioned that they undertook fewer activities due to tiredness or muscular soreness caused by sports. Another reason mentioned was that it was difficult to combine daily activities with the sports sessions, especially during the first 12 weeks of X-Fittt 2.0 when they attended two sports sessions a week.

The sports sessions in the first 12 weeks were seen as a social activity, during which the participants could socialise with others. *"I was active before that too, but still, at a*

certain point I missed those social things. Because you sit at home. Being among people for a while did some good." [I5 – t$_2$] Others indicated feeling less lonely 1 year after the start of X-Fittt 2.0 and participating in more social activities. *"I am more likely to say yes if someone says 'come with me to Ikea' or something like that. Before, I would have said no, but now I say yes... Because you are fitter, you can do it. And you are not constantly thinking about how embarrassing it is that you are so fat."* [I7 – t$_2$]

A few participants had hoped that participation in X-Fittt 2.0 would boost their social life, allowing them to make new friends with the other group members, but for them that did not happen. *"I still see two of them occasionally–we do the same group lesson–but otherwise not. I had a goal to get to know more people, but that hasn't happened yet. In the future, I might get to know more people outside the gym, but not yet."* [I9 – t$_2$]

At t$_3$, few participants mentioned aspects regarding their social life. Two participants felt the need for a romantic relationship, while a few others indicated that they are satisfied with their social life, even though some of them would have liked to have more social contacts. A few others mentioned that their number of social contacts had improved over the few past years. *"I came through a very difficult phase during which I locked myself up very much, because I had to get better first. Then I got [X-Fittt 2.0] and I felt very good. And then I dared to go out on the street more often. I go out to dinner with friends, we have card nights, we go out. And yes, I really started living a different life."* [I20 – t$_3$]

Discussion

We studied a care–PA initiative that was specifically developed for people with a low SES, investigating its impact on the participants' health, QoL and societal participation. We followed the participants for a period of two to three years, which enabled us to study the impact of such an initiative on the short term as well as the long term. This study shows that X-Fittt 2.0 was able to significantly reduce participants' body weight at all time points, and that waist circumference, blood pressure and self-perceived health decreased significantly during the first 12 weeks of the programme. Weight loss was highest one year after the start of X-Fittt 2.0. Participants also mentioned that they felt healthier, less stressed and more confident after participating in X-Fittt 2.0. Furthermore, positive trends were observed during the 2 years of X-Fittt 2.0 regarding paid work, sports and PA, and smoking and alcohol behaviour. Several participants also indicated that they have increased their daily activities, for instance because they feel more confident and have more energy. These results are in line with previous studies that show that PA is associated with an improved physical and mental health status, higher QoL levels, higher self-esteem and lower stress levels [11–14].

To obtain a complete picture of the impact of care–PA initiatives, a mixed-methods study including both quantitative and qualitative data such as this is valuable. The qualitative results of this study support the quantitative results that we observed. For instance, complementary to the observed health gains in the body measurements and questionnaires, during the group discussions and interviews many participants highlighted the positive impact of X-Fittt 2.0 on their physical health, such as weight

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loss, having more energy and having fewer physical complaints. Furthermore, increases in self-perceived health during the first 12 weeks, as measured with the questionnaires, were supported by changes in self-esteem and stress levels that many participants mentioned not only during the group discussions, but also in the interviews at t_2 and t_3. In addition, the data showed positive trends regarding paid work, which was supported by a few participants who indicated during the group discussions and interviews that they had worked more or started a paid job during the 2 years of X-Fittt 2.0. The quantitative results also showed that more people started sports or increased their PA in another way, which was supported by a myriad of the participants mentioning that they started exercising during X-Fittt 2.0, despite not being physically active at all before. Although some participants stopped sports after t_1, they indicated during the interviews that they had increased their PA outside the sports setting. Nevertheless, some participants who stopped being physically active indicated that they felt less healthy in the period after the first 12 weeks, which might explain the absence of statistically significant changes in self-perceived health after t_1. Furthermore, although we did not observe a quantitative difference in the use of medication, a few participants indicated during the group discussions and interviews that they had been able to reduce the amount of medication they took, for instance for diabetes or pain relief. Lastly, the positive trends in smoking and alcohol behaviour in the quantitative data were supported by the qualitative data. Thus, although statistical significance was missing in the quantitative data for most outcomes, the qualitative results supported the clinical relevance of X-Fittt 2.0.

QoL, as measured by the EQ-5D-3L, was rather stable throughout the study, whereas self-perceived health, measured with the EQ-VAS, increased significantly during the first 12 weeks. During the group discussions and interviews, some participants indicated that they experienced more physical problems and pain (due to injuries and muscle soreness), but that they still rated their health as higher overall because of improvements in other aspects, such as improved mental health. This could explain the difference we found in QoL and self-perceived health as measured using the questionnaires; however, these are speculations and more research is needed to support this.

Although a comparison with other care–PA initiatives is difficult because not all care–PA initiatives consist of the same programme components and involve different study populations, X-Fittt 2.0 seems to be equally successful, or even more successful, when compared with other care–PA initiatives, both for the general population and for people with a low SES. For instance, our results with regards to weight loss are better than previously studied care–PA initiatives, and although participants gained a bit of weight back after one year, the weight loss we observed at t_2 and t_3 was still larger than in the other studies [22–25]. Furthermore, the improvements in waist circumference and self-perceived health during the first 12 weeks are comparable with these other care–PA initiatives, as are improvements in sports and PA levels [22–25]. Despite these positive results, the absence of sustained positive results in our study could be caused by the decrease in the programme intensity after the first 12 weeks. The outcomes might have been more positive in the long term if the initial period of intensive guidance and sports activities had lasted longer than 12 weeks.

Strengths and limitations

An important strength of our study is the use of a mixed-methods design. Mixed-methods studies generally produce a more complete picture of a certain topic to inform theory and practice, and can be used to improve the generalisability of the results [30]. In our study, the use of mixed methods resulted in triangulation, with body measurements, self-reported measurements and qualitative data from the group discussions and interviews being used to obtain a complete and credible overview of health outcomes [31]. Another strength is the longitudinal character of our study, which helped to elucidate the impact of the initiative on the participants not only in the short term, but also over a longer period. This is important, as it highlights whether the results of X-Fittt 2.0 are maintained in the years after the intensive 12-week programme. We were able to collect and analyse data for two to three years after the start of X-Fittt 2.0 for most of the participants, which gave us insight into the long-term effects. In addition, the real-life setting of our study may have increased its external validity compared with a controlled design. Furthermore, people with a low SES can be hard to reach with research projects, but our collaboration with an existing care–PA initiative positively influenced the number of participants that we could include in our study. Due to this collaboration, the results obtained during the study period were immediately valuable to practice. Lastly, although we experienced some missing data, the type of data analysis that we used handles this issue relatively well [32]. With the use of this analysis method, we were able to include the data of all participants, instead of only the data from those participants who completed measurements at least two of the time points.

Some limitations should be mentioned as well. Although the chosen statistical analysis handles missing data quite well [32], the high amount of missing data in our study (55%) is still a major limitation. There are several explanations for this large amount of missing data. First, most of the data were not collected by the researchers themselves, but by lifestyle coaches and physiotherapists connected to X-Fittt 2.0. We believe that the distribution of the questionnaires by the lifestyle coaches had a positive impact on our response rate, because all participants had regular meetings with the lifestyle coaches; however, for the body measurements, a separate appointment with a physiotherapist was made, often at a later date, and not all participants attended. We think that this explains the lower number of completed body measurements at t_2 compared with the number of completed questionnaires at that time. We recommend that future researchers ensure that questionnaires and body measurements are taken at the same time. Second, X-Fittt 2.0 lasted for 2 years, but was not equally intensive throughout those 2 years. During the first 12 weeks, the participants had meetings with a lifestyle coach every one or two weeks. After those 12 weeks, this decreased to every few months, which made it harder to stay in touch with the participants, and hampered the collection of follow-up data for many of them. Third, not everyone in the group of participants spoke Dutch equally well, which made it hard or even impossible for some participants to fill out the questionnaires. The lifestyle coaches also indicated that the meetings they had with those participants were rather '*useless*', because they did not have the feeling that their messages regarding a healthy lifestyle were understood. Finally,

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the COVID-19 pandemic has influenced data collection because not all participants were willing to visit the sports centres for their follow-up measurements at t_3 during the pandemic. Furthermore, the pandemic might have influenced participants' health behaviours and responses to our questionnaires and interviews.

Another limitation of our study is that the body measurements were not performed by the same person nor at the same location at each time point. This means that the equipment that was used differed among the locations; for instance, at some locations, fat percentage was measured using skinfold thickness, while at other locations a weighing scale with built-in fat meter was used. Furthermore, skinfold thickness as measurement of fat percentage is prone to intra-observer error [33]. Thus, the different measuring persons or measurement locations made it difficult to compare the results, and we decided to exclude fat percentage from the outcome measures. Nevertheless, bias could still be present for the other body measurements. Future research should aim to minimise bias by creating a comprehensive research protocol and by using the same person and equipment for all measurements.

Conclusions

We aimed to study care–PA initiatives developed specifically for citizens with low SES, investigating their impact on the health, QoL, and societal participation of the participants. Although some participants felt less healthy after participating in X-Fittt 2.0 due to injuries or feeling tired, the majority of the participants experienced an improved health status. Participants lost weight, had more stamina, felt fitter and less stressed, reported a higher self-esteem and rated their own health more highly, especially immediately after the intensive 12-week period of the programme. Furthermore, participation in work increased for a few participants, and some mentioned undertaking more social and day-to-day activities. They also exercised more and generally had higher PA levels outside the sports setting. Overall, their awareness of a healthy lifestyle had increased, which improved their lifestyle. The participants mentioned several barriers to being physically active however, such as a lack of money or time, physical or mental health problems, and the COVID-19 pandemic. Thus, the intensive guidance at the start of the programme stimulated the participants to live more healthily and improved their health in the short term, but their independent continuation of the healthy lifestyle appeared more difficult for participants with a lack of resources. Future initiatives should aim to find ways to minimise the mentioned barriers and consider a longer intervention period. Furthermore, future research should aim for a more complete data collection to confirm the results reported here.

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Chapter 5

Assessing the impact of care–physical activity initiatives for people with a low socioeconomic status on healthcare utilisation: an exploratory study

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Abstract

Care–physical activity (care–PA) initiatives are being implemented in the Netherlands to stimulate the health of citizens with a low socioeconomic status (SES), with the aim of reducing health inequality and healthcare utilisation. As the impact of care–PA initiatives on healthcare utilisation has not yet been studied, our research question was: *'What is the impact of participation in a care–PA initiative on the healthcare utilisation of citizens with a low SES?'*. We studied the healthcare utilisation of 44 former participants of a care–PA initiative, focussing on general practitioner care, pharmaceutical care, hospital care, paramedical care, medical aids and mental health care. We compared utilisation intensity (number of healthcare claims) during the 2 years before participation in the care–PA initiative (period 1) with utilisation intensity during the 2 years after initial participation (period 2) using paired t-tests. As expected, utilisation intensity increased significantly for paramedical care for non-chronic disorders after participation. No differences in utilisation intensity were observed for the other healthcare categories. The design of our study can be used as a template for future research over a longer time period. The results of this and future studies can be used by policymakers to improve health policies.

Introduction

Over the past few years, care–physical activity (care–PA) initiatives have been implemented in the Netherlands to stimulate citizen health. These initiatives comprise a collaboration between the healthcare sector and the PA sector, focusing on improving the health and lifestyle of citizens by targeting multiple health behaviours [1]. The effectiveness of care–PA initiatives has been demonstrated in numerous studies using a wide range of outcomes, such as weight loss, reduced BMI, fewer lifestyle related diseases and improved quality of life [2–5]. In most studies, people with a low socioeconomic status (SES) report worse health than those with a higher SES, with health inequalities in terms of being overweight (60% versus 49%) or obese (20% versus 11%), life expectancy (seven-year difference), and years in good perceived health (18-year difference) [6,7]. Since care–PA initiatives improve health, they are seen as opportunities to reduce these health inequalities [6,8,9].

Health inequalities are also reflected in healthcare utilisation. Studies have shown that people with a low SES generally have higher healthcare utilisation and higher healthcare costs than those with a higher SES [10–12]. A recent study by Loef, Meulman, Herber et al. (2021) showed that healthcare expenditure and healthcare utilisation were higher among people with a low SES compared to people with a high SES [13]. When taking health status into account, these differences decreased considerably or even disappeared, but healthcare expenditure remained higher among people with a low SES for total healthcare, general practitioner care and mental health care. Higher healthcare utilisation among people with a low SES may partly be explained by the higher prevalence of overweight and obesity among these people, which leads to higher healthcare costs [14]. At the same time, a higher PA uptake has been associated with lower healthcare costs [15,16]; for example, De Boer et al. (2019) observed that neighbourhoods with a higher number of physically active citizens had lower total healthcare costs than those with a lower number of physically active citizens [1f6]. This impact was mostly seen in neighbourhoods composed mainly of citizens with a low SES.

Because of their positive effect on health, care–PA initiatives that are proven to be cost-effective have, as part of health policies, been covered by the Dutch basic healthcare insurance scheme from the beginning of 2019 for citizens who are overweight or obese [17]. Their cost-effectiveness has been assessed based on the amount of weight loss and the level of improvement of quality of life in relation to the costs of the initiative. This coverage by the basic healthcare insurance scheme means that the health care–related costs of these initiatives, such as consultations with a lifestyle coach, are covered for participants, while the PA component should be paid by the participants themselves. Funding participation in care–PA initiatives may be cost-effective in lowering healthcare utilisation as well; however, no such evidence is available. The objective of this paper was therefore to explore healthcare claims data for the participants of a Dutch care–PA initiative aimed at citizens with a low SES, with the aim of answering the following research question: *'What is the impact of participation in a care–PA initiative on the healthcare utilisation of citizens with a low SES?'.*

Materials and methods

Because we expected that PA has a greater impact on the consumption of certain healthcare categories than others, we selected a variety of healthcare categories for inclusion in our study: general practitioner care, pharmaceutical care, hospital care, paramedical care, medical aids and mental health care (Table 5.1). The selection was based on the literature and on the four most prominent non-communicable diseases associated with physical inactivity: cardiovascular disease, cancer, diabetes and respiratory disorders [18–24]. We included healthcare activities related to seven relevant chapters in the 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD-10) (Figure 5.1) [25]. We expected that participating in care–PA initiatives decreases healthcare utilisation for general practitioner care, pharmaceutical care, hospital care, medical aids and mental health care, based on the positive impact of PA [20–24]. Furthermore, we expected that paramedical care utilisation would increase, mostly due to the development of injuries when starting PA (physiotherapy) [26].

Table 5.1 Included healthcare categories and corresponding examples of healthcare insurance claims

Healthcare category	Examples of included healthcare claims
General practitioner care	Claims related to out-of-hours general practitioner care, consultations, home visits, mental health practice nurse, multidisciplinary care (chronic diseases)
Pharmaceutical care	Medication related to the metabolic system, cardiovascular system, systemic hormonal preparations, musculoskeletal system, nervous system, respiratory system
Hospital care	Claims related to endocrinal, nutritional and metabolic diseases; mental and behavioural disorders; diseases of the nervous system; diseases of the circulatory system; diseases of the respiratory system; diseases of the digestive system; diseases of the musculoskeletal system and connective tissue
Paramedical care	Claims related to physiotherapy, occupational therapy, manual therapy, remedial therapy, dietary counselling (incl. chronic disorders)
Medical aids	Claims related to medical aids needed for diabetes, asthma, sleep apnoea, (joint) pain
Mental health care	Claims related to treatments with and without overnight stay, and basic mental health care
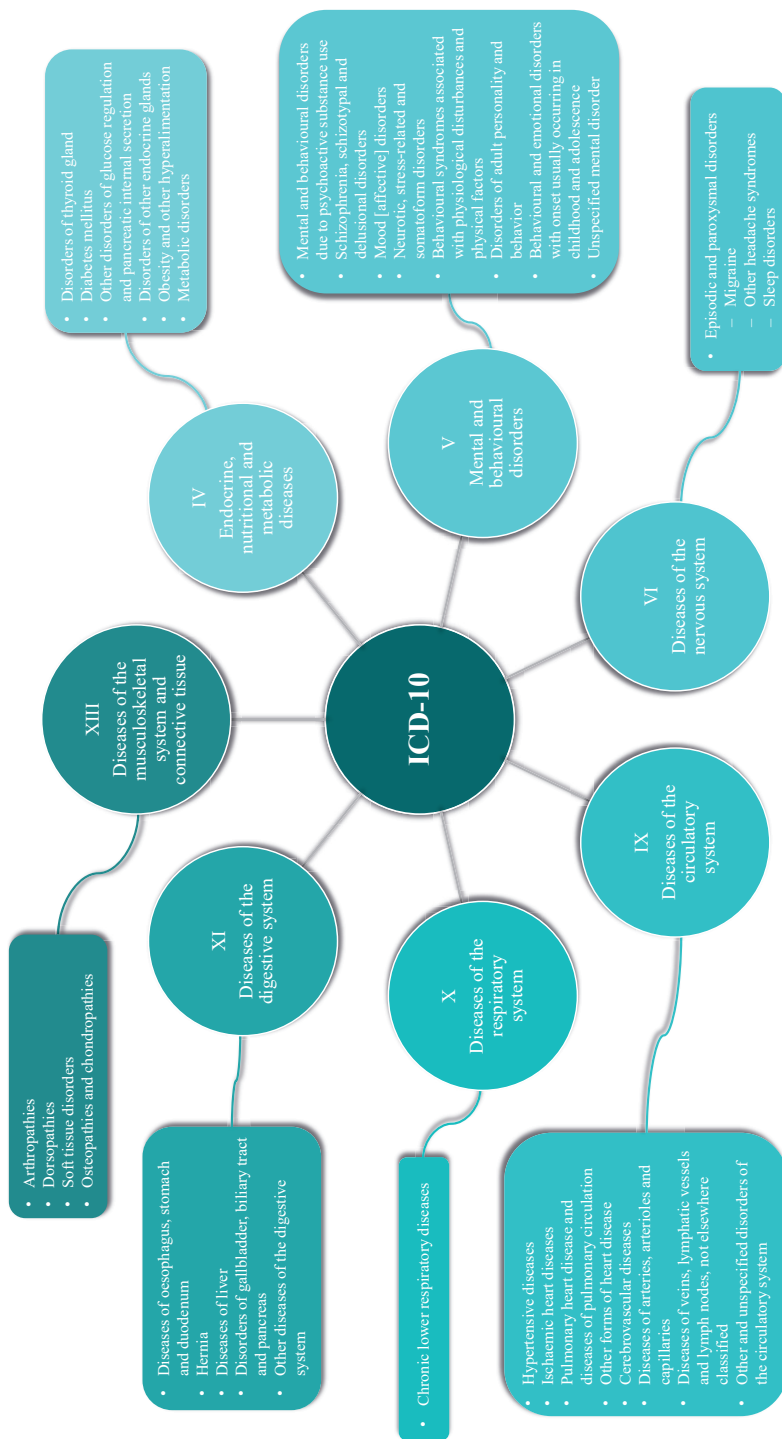
Figure 5.1 Overview of the selected chapters of diseases from the ICD-10 related to our research [25]

Design

To answer our research question, we focused on one specific Dutch care–PA initiative developed for citizens with a low SES. The studied care–PA initiative was developed and funded by a municipality in collaboration with one specific healthcare insurance company. It was aimed at people who were overweight, and who had an income at or below minimum level (low SES) [27], for whom it was free of charge. The initiative comprised a 12-week intensive programme, consisting of two weekly group sports sessions with a sports coach, one individual weekly sports session, dietary advice and monitoring by a dietitian, and 4 hours of lifestyle coaching by a lifestyle coach. After these 12 weeks, the participants were encouraged to maintain this healthy lifestyle by receiving aftercare comprising a total of 6 hours of lifestyle coaching over approximately 21 months after the end of the intensive programme.

We measured the effect of participation in the care–PA initiative on healthcare utilisation by comparing data on healthcare utilisation during the 2 years before participation in the care–PA initiative (period 1) with data on healthcare utilisation during the 2 years after the initial participation (period 2) (Figure 5.2). We thus used a before–after design in which the included participants served as their own control [28,29]. Period 2 started at the moment the participants started the care–PA initiative.

We decided to study healthcare utilisation and not healthcare costs because the latter change over time due to inflation. This change in cost is not the same for each claim, making it impossible to account for these changes in the data and thereby preventing a comparison of the healthcare costs for the two study periods. Healthcare utilisation, on the other hand, was an easily comparable measure because the number of healthcare claims during a certain time period is stable in its value and not prone to inflation.
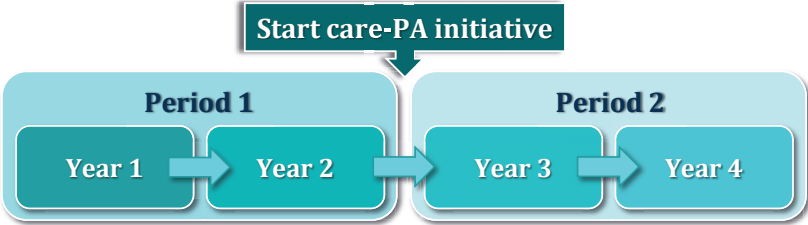
Figure 5.2 Timeline of data collection periods

Selection of participants

The study population consisted of participants of the care–PA initiative who started in October 2016 or January 2017 (i.e., the first two groups of the care–PA initiative). All participants were overweight, had a low SES as determined by their income (i.e., they all had an income at or below the minimum wage level and were receiving municipal benefits [29]), and were insured by one specific Dutch healthcare insurance company (HIC) that partly funded the care–PA initiative during all 4 study years.

Data collection

The dataset was developed by a data analyst of the HIC, who had been instructed by two researchers beforehand. For half of the participants (those who started in October 2016), data were collected over the period from October 2014 to October 2018. For the other half of the participants (those who started in January 2017), data were collected from January 2015 to January 2019. The data covered 99% of the delivered and billable care.

The dataset contained a unique study ID for each participant, demographic information (gender and age) and the healthcare claims data of interest for this study (see next section).

Data analysis

First, we made healthcare categories that we expected to be influenced by care–PA initiatives (Table 5.1). Second, we used descriptive statistics to specify the healthcare utilisation in each of the healthcare categories. Third, for each study period, we calculated the number of participants who used that healthcare category and the utilisation intensity (i.e., the average number of claims per participant per study period for that healthcare category). Fourth, we performed paired t-tests for all healthcare categories to check if utilisation intensity differed between periods 1 and 2. Because our sample size was greater than 30, the central limit theorem allowed us to use parametric tests [30], despite the differences between periods 1 and 2 not being normally distributed for all healthcare categories. The analyses were performed using SAS version 9.4.

Results

Participant characteristics

The sample consisted of 33 females and 11 males. The mean age of all participants (n=44) was 46.3 years, ranging from 20 to 68 years. For females and males separately, the mean ages were 46.7 and 44.9 years, respectively.

Healthcare utilisation

General practitioner care was used by all participants (n=44) in both periods 1 and 2, and pharmaceutical care and hospital care were used by a majority of the participants (range n=37 to 41) in both periods (Table 5.2). In addition to basic healthcare insurance, 10 participants had supplementary healthcare insurance during both study periods, which covers paramedical care for non-chronic disorders.

Taking all healthcare claims together, the number of participants using healthcare and the utilisation intensity did not change between periods 1 and 2; however, we observed a statistically significant increase in the mean utilisation intensity (12.8 more healthcare claims) of paramedical care from the supplementary healthcare insurance in period 2 compared with period 1. For all other healthcare categories, no statistically significant differences between periods 1 and 2 were found.

More than half of the participants used medications targeting the nervous system in both periods 1 and 2 (Table 5.2). The majority of medication healthcare claims were for psycholeptics and psychoanaleptics in both periods 1 and 2 (82% and 79%, respectively), such as antipsychotics, sedatives, antidepressants and agents used for ADHD.

Table 5.2 Healthcare utilisation before (period 1) and during and after (period 2) participation in a care–PA initiative: the number of participants receiving certain types of care, the average number of times participants who received a certain type of care within the indicated study periods and the mean difference in utilisation intensity.

	n	Period 1		Period 2		Period 2 – Period 1
		n	Intensity[a]	n	Intensity[a]	Mean difference in intensity
Basic healthcare insurance						
All care	*44*	*44*	*155.7*	*44*	*154.9*	*–0.9*
General practitioner care	*44*	*44*	*23.0*	*44*	*26.6*	*+3.6*
• Out-of-hours general practitioner care	44	20	0.9	17	1.2	
• Consultations (< 20 minutes)	44	43	8.8	40	8.0	
• Consultations (≥20 minutes)	44	35	3.6	32	4.1	
• Home visit (< 20 minutes)	44	1	0.0	0	0.0	
• Home visit (≥20 minutes)	44	2	0.0	2	0.0	
• Mental health practice nurse (< 20 minutes)	44	1	0.0	2	0.1	
• Mental health practice nurse (≥20 minutes)	44	10	1.1	16	1.3	
• Other consultations (phone, email, etc.)	44	38	5.6	40	7.5	
• Multidisciplinary care (COPD[b], CVR[c], DM[d])	44	15	2.0	19	3.4	
Pharmaceutical care	*44*	*40*	*91.7*	*37*	*91.8*	*+0.1*
• Metabolic system	44	5	3.5	6	3.7	
• Cardiovascular system	44	13	11.9	16	15.0	
• Systemic hormonal preparations	44	9	0.7	10	1.2	
• Musculoskeletal system	44	22	1.2	20	2.3	
• Nervous system	44	27	72.7	26	67.0	
• Respiratory system	44	13	1.8	11	2.7	
Hospital care	*44*	*41*	*35.1*	*38*	*29.2*	*–5.9*
• No ICD code	44	40	33.6	38	27.9	
• IV: Endocrine, nutritional and metabolic diseases	44	4	0.2	0	0.0	
• V: Mental and behavioural disorders	44	0	0.0	3	0.1	
• VI: Diseases of the nervous system	44	1	0.0	5	0.2	
• IX: Diseases of the circulatory system	44	8	0.5	9	0.4	
• X: Diseases of the respiratory system	44	6	0.2	6	0.2	
• XI: Diseases of the digestive system	44	1	0.1	1	0.0	
• XIII: Diseases of the musculoskeletal system and connective tissue	44	8	0.5	11	0.4	
Paramedical care (chronic disorders)	*44*	*11*	*2.3*	*14*	*3.1*	*+0.7*
• Physiotherapy	44	2	2.2	4	3.4	
• Occupational therapy	44	1	0.3	1	0.6	
• Dietary counselling	44	9	3.2	11	3.5	

	n	Period 1		Period 2		Period 2 – Period 1
		n	Intensity[a]	n	Intensity[a]	Mean difference in intensity
Medical aids	*44*	*10*	*2.7*	*13*	*3.0*	*+0.3*
Mental health care	*44*	*17*	*0.9*	*17*	*1.1*	*+0.2*
• DBC[c] with stay	44	2	0.4	6	0.9	
• DBC[c] without stay	44	17	1.7	16	1.6	
• Basic mental health care	44	1	0.1	2	0.1	
Supplementary healthcare insurance						
Paramedical care	*10*	*10*	*23.7*	*10*	*36.5*	*+12.8**
• Physiotherapy	10	10	22.4	10	33.6	
• Manual therapy	10	1	0.4	3	1.7	
• Remedial therapy	10	0	0.0	1	0.2	
• Dietary counselling	10	2	0.9	3	1.0	

[a] The average number of claims per participant per study period (n=44 for basic healthcare insurance, n=10 for supplementary healthcare insurance); [b] Chronic obstructive pulmonary disease; [c] Cardiovascular risk; [d] Diabetes mellitus; [e] Diagnosis treatment combination
[*] $p < 0.05$

Discussion

The present study aimed to provide insight into the impact of participation in a care–PA initiative on the healthcare utilisation of citizens with a low SES. While participation in these initiatives has been associated with positive health outcomes among people with a low SES [2–5], its effect on healthcare utilisation has remained unknown to date. This exploratory study, which is unique for its use of healthcare claims data for participants of a care–PA initiative, shows a statistically significant increase in utilisation intensity for paramedical care (supplementary healthcare insurance) in period 2 compared with period 1, as expected. This increase is likely caused by a greater utilisation intensity for physiotherapy, which covers respectively 95% and 92% of the paramedical healthcare claims of the supplementary healthcare insurance in periods 1 and 2. An explanation for this increase could be that the risk of developing PA-induced injuries is higher among people who are not physically active on a regular basis [26]. Furthermore, it is possible that participants already had injuries before starting the care–PA initiative, and that the lifestyle coach told them to go visit a physiotherapist to treat the injuries. We should mention, however, that paramedical care (not for chronic disorders) is covered by an additional voluntary healthcare insurance in the Netherlands, and not all participants had this additional healthcare insurance. It is possible that more people used paramedical care, but for patients without this additional healthcare insurance, these visits are not registered. No differences were found for paramedical care for chronic disorders, which is covered by the basic healthcare insurance.

We also expected that participating in care–PA initiatives would decrease healthcare utilisation for general practitioner care, pharmaceutical care, hospital care, medical aids and mental health care; however, we did not find any difference in the utilisation

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intensity for these healthcare categories. We expect that this is mostly due to the relatively short study period (2 years before versus 2 years after the start of the care–PA initiative). Furthermore, it appeared in the results that more than half of the participants use psycholeptics and psychoanaleptics, indicating mental health disorders, which might also explain the lack of effects on healthcare utilisation [30].

Although it was not the core focus of this study, our results show that people with a low SES tend to have higher healthcare utilisation than those with a higher SES, which was also shown previously [10–13]. During periods 1 and 2, our study sample had an average of 11.9 contact moments with general practitioner care per year, while this was only 4.2 contact moments in the years 2015 to 2018 for the general Dutch population [32]. For out-of-hours general practitioner care, our study sample had, on average, 0.5 contact moments per year, compared with 0.2 contact moments per year for the general Dutch population [33]. Furthermore, 88% of our study sample used medication, compared with 66% of the general Dutch population in 2015–2018 [34]. Finally, 39% of our study sample used mental health care in periods 1 and 2, compared with about 10% of the general Dutch population [35].

Strengths and limitations

Our collaboration with a HIC gave us the unique opportunity to analyse the healthcare claims data of the participants of a care–PA initiative aimed at people with a low SES, which had never been done before. Furthermore, our study design for measuring healthcare utilisation has several strengths: the before–after design allowed us to compare healthcare utilisation before participation in the care–PA initiative with the healthcare utilisation after participation; focussing on healthcare utilisation instead of healthcare costs allowed us to make comparisons over several years, because this indicator is stable in value and not prone to inflation; and the dataset contained 99% of all billable care during the study periods, due to the retrospective perspective of the study. This study design could be an inspiration to future researchers who want to conduct a similar study.

Besides the uniqueness and strengths of our study, some limitations must also be mentioned. First, the sample size was rather small. This can partly be attributed to an administration of delivered and billable care that tends to run some years behind. Because of this, only participants who started with the care–PA initiative a sufficient number of years ago could be included in the study. Future research should aim to include a larger sample. Second, the short study period is a limitation. The impact of participating in a care–PA initiative on healthcare utilisation may only become visible on the long term; therefore, we recommend that future research includes longer study periods. Third, the study design would have been stronger with the inclusion of a control group consisting of people who are not a former participant of the care–PA initiative. This control group should be matched at least for BMI, age, gender, and SES to the study population; however, the selection of such a control group appeared impossible, since BMI is not included in the database of the HIC due to privacy regulations. Fourth, although we know that participants started the care–PA initiative, we do not know how high the programme adherence was; for instance, participants may not have attended all

sessions, or may have dropped out completely before the end of the care–PA initiative. The interpretation of the results could be improved by including this information; however, this has some implications regarding privacy. Hence, future research should investigate whether enriching the data with information on programme adherence is possible, while respecting participants' privacy.

Conclusions

The results of this study are relevant for the development of health policies, especially with regard to policies aimed at promoting PA. Our study, for instance, underlines the difference in healthcare utilisation between people with low and higher SES. Furthermore, the design of our study can be used as a template for future research. Due to the relatively short study period and the small sample, our results were limited. We therefore recommend that future studies include a larger study population; a longer data collection period; and a control group matched for BMI. The results of such studies are of interest to policymakers for improving health policies. The insights of such studies can help to shape health policies to ensure they suit the needs of the whole population, and to enable health policies to contribute to decreasing health inequality.

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Chapter 6

A qualitative study of the experiences of participants in X-Fittt 2.0, a combined lifestyle intervention for citizens with a low socioeconomic status

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Abstract

X-Fittt 2.0 is a two-year combined lifestyle intervention (CLI) for citizens with a low socioeconomic status (SES). It starts with 12 weeks of intensive guidance and is followed by a low-intensity phase of aftercare. The aim of this research was to gain insight in the experiences of participants. We conducted 17 group discussions (n=71) after 12 weeks and 68 individual interviews after 1 and 2 years. A thematic analysis resulted in five themes: *'participants' goals', 'programme content', 'accessibility', 'group dynamics',* and *'guidance'.* Most participants participated because of their health. Participants thought the programme was accessible because of the pleasant atmosphere in the sport centre and the free (fitness) activities. The majority liked that the programme was offered in a group with 'people like them' (i.e., people with overweight). The participants were satisfied with the guidance from the lifestyle coach and sports coach, but they had expected more guidance from the dietitian. Although participants were generally satisfied with the programme, many indicated that the intensive period of 12 weeks was too short to achieve long-term behavioural change. These new insights can contribute to improve (existing) CLIs, so they are better tailored to citizens with a low SES.

Introduction

Overweight and obesity are more prevalent among citizens with a low socioeconomic status (SES). 60.9% of people with a low SES are overweight, compared to 43% of people with a high SES [1]. For obesity, this is 20.9% compared to 8.5% [1]. To reduce overweight and obesity, the health care portion of the combined lifestyle intervention (CLI) has been included in the Dutch basic healthcare insurance scheme since January 2019 [2]. This includes programmes such as SLIMMER, BeweegKuur and CooL, and recently Samen Sportief in Beweging (SSiB). These CLIs have demonstrated a positive effect on health and quality of life [3–6]. However, fewer people than expected are using the CLIs, for example because the exercise portion of the CLI is not covered by health insurance [2]. This is especially problematic for citizens with a low SES, who are mostly likely to experience financial barriers to exercise [7]. In addition, intensive, positive and stimulating support is important for people with a low SES, and the barriers they experience (e.g., stress, debts physical symptoms) should be taken into account [7–12]. In other words, a CLI for citizens with a low SES requires its own approach.

In 2016, local parties in Arnhem developed a CLI for people with a low SES: X-Fittt 2.0 [13]. This is a 2-year CLI that starts with a 12-week intensive programme consisting of: two weekly group exercise sessions with a sports coach focusing on fitness, strength, flexibility and balance, and one independent sports session; dietary advice from a dietitian focusing on the dietary pattern; and coaching by a lifestyle coach to work on personal goals and self-management (Chapter 1, Figure 1.1). After these 12 weeks, the exercise programme and the dietary advice stop, and participants start exercising and being physically active on their own. However, participants still receive six hours of lifestyle coaching at fixed times over the rest of the 2-year period.

Due to a collaboration with the municipality, the cost of the exercise portion in the first 12 weeks is paid. To participate in X-Fittt 2.0, a person must have an income at or below the minimum wage level (i.e., our definition of low SES in this study) and receive benefits from the municipality. The municipality sends these citizens a letter with information about X-Fittt 2.0 that invites interested people to call the lifestyle coach to register.

In addition to an effect evaluation [14], it would be desirable to study the experiences of X-Fittt 2.0 participants. Not only to explain the effects or lack thereof, but also to improve existing CLIs and better align them with the needs of low SES participants. Therefore, our research question was: *'What are the experiences of participants in the combined lifestyle intervention X-Fittt 2.0?'*

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Method

To gain insight into the experiences of X-Fittt 2.0 participants, group discussions were held 12 weeks after the programme began and individual semi-structured interviews were held after 1 and 2 years. The individual interviewees were (mostly) the same as the participants in the group discussions. The study was conducted between 2016 and 2021 and involved all six groups (divided over three sports centres) that started the programme in that period. Only the first four groups were included in the individual interviews because data saturation was reached thereafter. The study was approved by the Social Ethics Committee of Wageningen University & Research (WUR).

Group discussions
In total, 17 group discussions were held after the last sports session of the first 12 weeks (t_1). The discussions lasted an average of 27 minutes. Participants received an email from the lifestyle coaches in advance announcing the group discussions and emphasising that participation was voluntary. All participants present participated in the group discussions (n=71). We used the APEF tool, which presented participants with six statements to facilitate the conversation (Appendix 6.A) [15]. For each statement, participants could use coloured voting cards to indicate whether they agreed or disagreed with the statement: green for agree, yellow for neither agree nor disagree, and red for disagree. Afterwards, the voting results were discussed and participants could clarify their opinions. The statements used were formulated in cooperation with Pharos to increase comprehensibility. During the interview, participants also filled in evaluation forms on which they could rate X-Fittt 2.0 (1-10) and give a brief explanation.

Individual interviews
The individual interviews took 17 minutes on average and were conducted one (t_2, n=31) and two (t_3, n=37) years after the start of X-Fittt 2.0. The lifestyle coaches sent an email to the participants still in the programme inviting them to participate in the interviews and emphasising that participation was voluntary. Of invited participants, 65% took part in an interview. Interviews took place after the participants' appointments with the lifestyle coach. Interview questions were formulated in understandable language in cooperation with Pharos (Centre of expertise on health inequalities).

Objectivity and consent
All discussions and interviews were conducted by researchers from WUR without the presence of lifestyle coaches, sports coaches or dietitians to ensure the objectivity of the evaluation and allow participants to speak freely. All participants consented to audio recording and to using the data for research purposes.

Data analysis
Averages were calculated for the ratings on the evaluation forms (n=71) and reasons for high and low ratings were examined. The recordings of the group discussions and

interviews were transcribed and analysed via a thematic analysis [16]. After we became familiar with the data (step 1), we inductively developed initial codes by reading the data (step 2). About 50% of the data was coded by two (interviews) or three (group discussions) researchers. The codes largely overlapped. Consensus was reached on the code list and one researcher coded the remaining data.

Next, the codes were sorted into potential themes (step 3), which we then revised by carefully reading the data in each theme (step 4). We analysed the content of the themes and named the five developed themes: *'participants' goals', 'programme content', 'accessibility', 'group dynamics'* and *'guidance'* (step 5). Finally, we selected quotes and recorded the results (step 6). All analyses were performed using ATLAS.ti, version 9.

Results

The five themes we developed are elaborated on below. Appendix 6.B shows the frequency with which each theme appeared in the group discussions (GD) and interviews (I).

Participants' goals

Participants expressed various reasons or goals for their participation. Improving health (e.g., losing weight or increasing endurance) was mentioned often, as well as exercising more, being less socially isolated or taking advantage of a free programme. *"Because I felt like I was sitting more, I wanted to have more energy. Physical fitness was more important to me than weight loss. I've always been overweight, so I'm kind of used to that. But it's nice to have a certain level of fitness."* [I24–t_2]

Programme content

After 12 weeks, the participants generally rated X-Fittt 2.0 positively, with an average rating of 8.3, 95% CI [8.0; 8.6]. Two participants decided the programme did not suit them because of physical complaints or because they thought that too little nutritional guidance was provided, and they rated the programme a 4 (lowest mark among respondents). Fourteen participants gave the programme the highest possible rating (10), mainly because they lost weight and enjoyed the programme.

Participants said that they had received sufficient information about a healthy lifestyle. They appreciated the structure of X-Fittt 2.0 and the broad scope of the programme (e.g., fitness, nutrition advice). Participants liked that the municipality paid for X-Fittt 2.0. They also liked the support they received from the lifestyle coach after the first 12 weeks. *"The aftercare phase is very good; you still have someone you can lean on."* [I2–t_2]

Regarding the sports sessions, most participants were happy with the build-up of intensity and the variety of sessions. *"I thought it was feasible and I understand that it was difficult for people who already had injuries. But personally, I had only positive experiences."* [GD3–t_1] Participants liked that they did not have to think about exercises themselves because they were guided by a sports coach, and they liked that they could do the exercises at their own pace. However, some participants thought the sports sessions were too strenuous or too repetitive. *"The exercises need to be much more adapted to the*

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complaints that people come in with and not like 'come on, keep going' you know and set your own limit." [GD14–t$_1$] Finally, participants indicated that the materials could be improved.

The most important disadvantage mentioned is that the intensive programme is too short (12 weeks). Participants would prefer a programme of at least 24 weeks to give them time to get more familiar with their new lifestyle for the long term. *"And I think it's too short: 12 weeks and then you're basically on your own. And now it's up to you… But life is not only about those lists… If I look at myself and my life cycle with diets, it becomes very difficult once you're on your own."* [GD8–t$_1$] *"That's why I think three months is fine to make a first start to turn your life around, but I don't think it's [embedded] in your life after three months, so I think it's very easy not to go to a group class… Especially after those three months, losing weight takes longer, you have to make more effort, and it's very difficult to keep going."* [I7–t$_2$] Furthermore, some participants felt like the scales measured very differently and felt that the timing of when X-Fittt 2.0 was offered was not convenient (for that group, the intensive programme stopped right before Christmas). In addition, some participants experienced organisational problems (e.g., with communication from the coach).

Another suggestion was to add group discussions about lifestyle-related topics in the first weeks. *"Actually, that is exactly what I missed. I think that if we had had this kind of conversation more often in between, then perhaps the programme could have been adjusted… I think we would have been able to encourage each other more."* [GD8–t$_1$] Participants also wanted group sessions in which they could exchange experiences after the first 12 weeks. *"It was very intense for 3 months and then 'goodbye'. And after so many months, you get a call asking 'What are you doing?' I think it would have been nice to have some more follow-up moments."* [I5–t$_3$] Participants also felt that X-Fittt 2.0 could have offered more flexibility, such as offering sports sessions at various times.

Accessibility

The municipality invited people to participate in X-Fittt 2.0, and that was the final push some participants needed. *"For me, that [letter] came at exactly the right time. Because I was just thinking about starting to exercise again and then suddenly a letter like that arrived. Then I thought, 'Hey..'".* [GD7–t$_1$]

Participants said that X-Fittt 2.0 was accessible because of the atmosphere in the sports centres where it was offered. *"Here, you aren't the loser, like 'you don't know it all' or 'look, you're fat, you've eaten too much'. Here, you are appreciated as you are. That's very important for your self-confidence."* [GD1–t$_1$] At t$_3$, many participants stated that they still work out at the same sport centre, primarily because they feel comfortable there. *"Well, I've seen enough sports centres from the inside, and I'm still happy with [sports centre]. You're guided there, they keep an eye on you, and if there is something wrong with you, they see it… Everything is explained to you and you receive good guidance. And for me, that's definitely a plus."* [I11–t$_3$]

Although participants experienced X-Fittt 2.0 as accessible, some indicated that they do not have the financial means to continue exercising. "*May I give another reason why*

I'm sad that it's ending? The reason is that financially I will probably not be able to continue… But for me this was also kind of a thing to…it probably sounds very terrible, but a means to get out of a kind of social isolation. And then you fall back into it very quickly…because you don't have the means to continue with it." [GD8–t_1] Some participants also felt that information should be available in multiple languages.

Group dynamics

The vast majority of participants enjoyed being part of a group for the first three months because the atmosphere was good and they were surrounded by people like themselves. *"Yes, and it's also not embarrassing when everyone has fat rolls everywhere. Then you're all standing around with fat rolls. That's very different from being in a sports centre with all those very slim people. That alone is very stressful."* [I7–t_2]

The participants said that in a group they could motivate each other well during the sports sessions, which helped them stick with it. *"I didn't expect in advance that I would want to continue, but now I do… On my own I wouldn't stick with it, but I enjoy it in the group."* [G6–t_1] They also mentioned that a group makes you try that little bit harder, even though you are already tired. *"Not so much in terms of getting there, but if you were there you'd think, 'If she can do it, so can I'. You don't want to be worse than another person."* [I24–t_2]

But some participants said that exercising in a group was not suitable for everyone (e.g., for people with (mental) health problems). A few participants preferred to do individual workouts in the sports centre.

Guidance

In general, participants were satisfied with the lifestyle coach, sports coach and dietitian. Participants felt they worked well together and that they helped them to develop and maintain a healthy lifestyle.

The vast majority of participants appreciated the lifestyle coach's involvement, which they found sincere and helpful. This helped them avoid going back to their old lifestyle, especially after the first 12 weeks. *"If there had been no sessions with the lifestyle coach after the first 12 weeks, nothing would have come of [exercising]. Then I would have postponed it or stopped."* [I22–t_2] Participants felt listened to by the lifestyle coach, without being judged. *"I really enjoyed the conversations with [the lifestyle coach] because you could say anything and I felt that she really listened to me. And she also expressed a certain empathy."* [I40–t_3] The lifestyle coach also helped with the choice of a follow-up exercise programme after the first 12 weeks of X-Fittt 2.0. However, a few participants indicated that they had expected more guidance from the lifestyle coach and felt that there should be more contacts with the lifestyle coach in the last year.

Participants were happy with the sports coaches who guided them in the first 12 weeks. They particularly mentioned the trainers' enthusiasm and how they helped them to exercise without getting injured. *"It's encouraging when you're working out and you hear 'Hey, you're doing well!' while you had been thinking 'Am I doing this right?' And then you hear it again."* [G7–t_1] *"He shows the exercises in such a way that I really get super*

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motivated." [G8–t$_1$] However, some participants said they had had too many different sports coaches.

Although some participants were satisfied with the dietitian, others said that they would have preferred more sessions, that they would have liked more emphasis on nutrition in X-Fittt 2.0, and that the nutritional needs of the individual participants should be listened to more. *"I myself was very much struck by the fact that...it's not tailored to the individual. It's a bit of a one-size-fits-all."* [G8–t$_1$] *"I would recommend the exercising, but I would modify the dieting. Make it more personal. The rest I would recommend as-is."* [G6–t$_1$] Participants also felt that there should be clearer guidelines for the period after the first 12 weeks. *"You get a diet and then that programme stops... But where is the normal eating schedule? I would add that... How should you eat if you eat normally? That's hard to figure out by yourself."* [I7–t$_2$] Participants suggested that group sessions with the dietitian should be organised in X-Fittt 2.0 and that the dietitian should ensure that everyone gets sufficient feedback on their eating behaviour. *"In the beginning we had to... write everything down for three days. And the first three times I think it was assessed, and then I heard nothing more about it."* [G11–t$_1$]

Some participants would have liked a physiotherapist and a psychologist to be part of X-Fittt 2.0. Some participants also said that they know what they can and cannot do, or that they do not want rules imposed on them, particularly with regard to nutrition. *"I have already had a gastric bypass and six different dietitians. I know what I can and cannot eat."* [G1–t$_1$] *"Yes, but I'm not interested in obligations. I always had that time with my work and now no longer."* [G1–t$_1$]

Discussion

The purpose of this study was to gain insight into how participants with a low SES experience X-Fittt 2.0. This programme differs from CLIs, for which the health care-related costs are covered by the basic healthcare insurance scheme [3–6], in two ways: the exercise component is paid for by the municipality and the guidance provided by the lifestyle coach is more intensive and specifically addresses the barriers experienced by citizens with a low SES. Using a thematic analysis of group discussions and individual interviews, five themes were developed that summarise the results: *'participants' goals', 'programme content', 'accessibility', 'group dynamics'* and *'guidance'*.

In general, the participants in this study were satisfied with X-Fittt 2.0 because the programme helped them improve their health and lifestyle. They mentioned several aspects that were specifically included in the development of X-Fittt 2.0 because of the target group (citizens with a low SES), such as the intensive free (exercise) guidance in the first 12 weeks. Participants felt that X-Fittt 2.0 was accessible because of the pleasant atmosphere in the sports centre, which made them feel at ease. They also liked being in an exercise group with 'people like themselves' (i.e., people with overweight), which encouraged them to persevere. They also praised the lifestyle coaches and sports coaches for their guidance, enthusiasm and commitment. These results are consistent with the

effective elements of CLIs and the approach to obesity for citizens with a low SES found in previous studies [12, 17].

Although the participants were generally satisfied with X-Fittt 2.0, there were also aspects with which they were less satisfied. Not everyone liked exercising in a group. Furthermore, some participants would have liked to continue exercising after the first 12 free weeks but had to stop because they could not afford to pay to continue. Although X-Fittt 2.0 provides more intensive coaching in the first 12 weeks than the standard CLI, some participants expected more frequent contact with the coaches, especially the dietitian. They also thought that nutrition was an insufficiently discussed theme. The biggest drawback they mentioned was that the intensive 12-week start was too short. Areas for improvement were the content of X-Fittt 2.0, such as including group discussions, and the extent to which the programme can be tailored to individuals. These results show that it is important for the CLI to correspond to personal wishes and needs, as previous studies into effective elements have also shown [12, 17].

The ratings for X-Fittt 2.0 are about the same as for SSiB (8.3 versus 8.1), another CLI for citizens with a low SES [6]. However, there is no detailed insight into participants' experiences with that CLI. No evaluation of the other CLIs in the basic healthcare insurance scheme has been done with people with a low SES. However, the evaluations that have been done indicate that the nutritional component of those CLIs is generally rated more positively than that of X-Fittt 2.0 [18, 19]. The evaluation of CooL also showed that its participants, like those in X-Fittt 2.0, would have liked to have follow-up meetings [20]. In addition, BeweegKuur participants, like those in X-Fittt 2.0, wanted the exercise coaching to last longer than just the first 12 weeks and they reported that it can be difficult to maintain healthy behaviours after intensive coaching [18]. Although our study focuses on citizens with a low SES, it seems that (some of) our results do not apply specifically to citizens with a low SES, but also to other CLI participants. Therefore, we recommend extending the exercise coaching beyond the initial 12-week period.

Some participants mentioned that they would have liked to have had group discussions with other participants to reflect, exchange experiences and learn from each other. Previous studies have also shown that these types of open group discussions are motivating and support group processes, which helps to change behaviour related to lifestyle [21, 22]. It is therefore advisable to make this type of discussion with group peers part of the CLI.

Based on these results, the small number of participants in the CLI can be explained by participants' having to pay for the exercise component themselves. Citizens with a low SES, the group in which overweight and obesity are more common, often have less money to spend, and the participants in our study indicated that working out is often too expensive. Having to pay for the exercise component of a CLI can be a barrier for people with a low SES, so we suggest that the exercise component should be included in the basic healthcare insurance scheme.

A strength of our study is the large amount of data we collected through group discussions and interviews. This allowed us to form a clear idea of how participants

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experienced X-Fittt 2.0. Another strength is the objective character of the researchers (they were not involved in implementing X-Fittt 2.0), as this allowed participants to speak freely.

One limitation of the study is the possible selection bias because the researchers did not talk to the people who dropped out of the programme (34%), but only with participants who were still taking part in X-Fittt 2.0. People who dropped out were not approached for the study because the lifestyle coaches no longer had contact with them. Of the participants who were still in the programme, 65% participated in an interview at t_2 or t_3. Future research should include dropouts to investigate whether they experienced X-Fittt 2.0 differently than the participants in this study.

Conclusions

In conclusion, X-Fittt 2.0 received a mostly positive evaluation. Participants appreciated the guidance and the atmosphere in the sports centre, and they were grateful that the programme was paid for. Yet participants also have suggestions, such as increasing the focus on nutrition in the programme and extending the intensive counselling beyond the first 12 weeks to promote the maintenance of healthy behaviour. It has also become clear that making exercise free for citizens with a low SES could ensure lifestyle changes in the long term. Other (future) CLIs can use this knowledge to make CLIs more suitable for citizens with a low SES.

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Chapter 7

Effective elements of a combined lifestyle intervention for people with low socioeconomic status: a concept mapping case study

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Abstract

Health inequalities still exist between people with a low socioeconomic status (SES) and people with a high SES. Combined lifestyle interventions (CLIs) could benefit the health of people with a low SES. However, it is unclear which CLI elements are effective for this group. Therefore, this study aimed to determine the effective elements X-Fittt 2.0, a CLI for people with a low SES. Nine professionals and one participant of X-Fittt 2.0 participated in a concept mapping (CM) process to develop an overview of the effective elements of X-Fittt 2.0. CM consists of six steps: preparing, brainstorming, clustering, scoring, analysing, and discussing and interpreting. This process resulted in 72 effective elements, grouped in nine clusters, focused on monitoring (12), internal (7) and external (4) collaborations, structure and guidance (10), agreements with participants (5), sports options in the first 12 weeks (10), the sports environment (10), recruitment strategies (5) and the preconditions for X-Fittt 2.0 (9). These results provide a valuable first overview of effective elements of CLIs for people with a low SES.

Introduction

As in the rest of the world, Dutch overweight (50%) and obesity (15%) levels are high and it is expected that they will rise, especially among those with a low socioeconomic status (SES) [1, 2]. While various interventions are used to decrease health inequalities between people with a low and a high SES, recent figures show that these inequalities are still a major concern with regard to public health. People with a high SES live approximately 7 years longer than people with low SES, and also enjoy 18 more years of perceived good health as compared to people with a low SES [1].

These health inequalities may be caused by differences in lifestyle, such as physical activity (PA) and nutrition, between low and high SES citizens [3]. Regular PA has beneficial effects on health and in preventing various chronic diseases, such as diabetes, cancer, and cardiovascular disease [4, 5]. An opportunity to stimulate a healthy lifestyle lies in developing and implementing health improving initiatives, such as combined lifestyle interventions (CLIs) [6].

CLIs focus on improving health by targeting multiple health behaviours simultaneously (e.g., PA and diet). As a multi-pronged approach, CLIs offer intensive guidance with health professionals from different sectors, such as the sports sector and primary care [7]. Therefore, CLIs are considered to be more successful than single-behaviour and single-sector interventions [8, 9]. To date, however, insight is still lacking into which elements make CLIs effective for citizens with a low SES [10].

Researchers use different concepts to refer to effective elements, such as active ingredients [11, 12], core components [13], effective principles (translated from Dutch) [14], good practice characteristics [15], and principles for action [16]. We based our definition of effective elements on the definition of the Dutch National Institute for Public Health and the Environment: *"Effective elements are the elements that make an intervention successful. These elements should be included when the intervention is implemented"* [17]. Effectivity is more likely to be caused by multiple elements in combination, rather than by one element alone [18].

Despite the increasing attention to CLIs, previous research has not yet focused on effective elements of CLIs for citizens with a low SES specifically. Earlier research identified the most important effective elements of CLIs for the general population [19] and the preconditions for lifestyle interventions – not CLIs – for citizens with a low SES [20]. Furthermore, for the general population, the *good practice characteristics* of diet and PA interventions have been researched [15], and the *barriers and facilitators* for adhering to PA programmes have been identified [21] – not CLIs. In practice, it appears that relatively few citizens with low a SES are reached by the current supply of CLIs [22, 23], which may indicate that CLIs do not sufficiently connect to target groups with low SES. Therefore, insights into the effective elements of CLIs for citizens with a low SES contribute to improving existing and to designing new CLIs to establish long-term health behaviour change among citizens with a low SES [24]. In this study we focus on the CLI X-Fittt 2.0, by addressing the following research question: what are the effective elements of X-Fittt 2.0?

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Methods

Study case

We have focused this study on X-Fittt 2.0, which is the first Dutch CLI specifically developed for citizens with a low SES [25]. X-Fittt 2.0 is being carried out in Arnhem, a municipality in the Netherlands. The municipality (Sports Service Arnhem) and a health insurer mutually funded X-Fittt 2.0, which focuses on people with a minimum income or lower [26]. X-Fittt 2.0 runs for 2 years, and starts with a 12-week intensive programme, consisting of: two weekly group sports sessions with a sports coach, one individual weekly sports session, dietary advice and monitoring by a dietitian, and 4 hours of lifestyle coaching by a lifestyle coach. After these 12 weeks, participants are encouraged to maintain the healthy lifestyle by receiving a total of 6 hours lifestyle coaching during the remainder of the programme (approximately 21 months). The first results of X-Fittt 2.0 indicate that the programme has a positive impact on the participants in Arnhem, at least in the first 12 weeks, for instance in reducing weight and fat percentage, and improvements in quality of life and societal participation [26].

Concept mapping of effective elements of X-Fittt 2.0

1. Preparing
Selection of respondents

n = 22: 3 coordinators, 4 sports coaches, 6 physiotherapists, 2 dietitians, 2 lifestyle coaches, 5 participants

2. Brainstorming
Online form for collecting effective elements

n = 10: 2 coordinators, 2 sports coaches, 3 physiotherapists, 2 lifestyle coaches, 1 participant

3. Clustering
Formation of clusters by respondents

n = 9: 2 coordinators, 2 sports coaches, 3 physiotherapists, 1 lifesyle coach, 1 participant

4. Scoring
not important at all (1) – very important (5)

n = 9: 2 coordinators, 2 sports coaches, 3 physiotherapists, 1 lifesylte coach, 1 participant

5. Analysing
Multidimensional scaling and hierarchical cluster analysis

6. Discussing and interpreting
Group meeting with respondents

n = 4: 1 coordinator, 1 sports coach, 1 physiotherapist, 1 lifestyle coach

Figure 7.1 Flow chart of the CM process to unravel the effective elements of X-Fittt 2.0, based on Kane & Trochim (2007) [27]. For every step, the number of respondents and their professions are indicated.

Methodology

We used concept mapping (CM) to develop a comprehensive overview of the effective elements of X-Fittt 2.0 [27]. CM is a type of structured conceptualisation, which can be used for groups. CM consists of six steps: preparing, brainstorming, clustering, scoring, analysing, and interpreting (Figure 7.1).

Step 1: preparing
We invited 22 people via email to participate in the CM process: all 17 public health practitioners of X-Fittt 2.0 (Figure 7.1) and five citizens with a low SES who participated in X-Fittt 2.0 in Arnhem (the particular citizens were suggested by the lifestyle coaches). Eventually, 11 respondents (10 public health practitioners, 1 participant) agreed to participate (Figure 7.1). The others did not answer the email invitation nor the reminder (n=6), or did not want to participate for various reasons (n=5).

As preparation, the respondents received a detailed research guide that described the steps of the CM process and our definition of effective elements, adapted for X-Fittt 2.0: *"By effective elements we mean the elements of X-Fittt 2.0 that should definitely be included when implementing X-Fittt 2.0 in another municipality. In other words, which elements of X-Fittt 2.0 are necessary to make the programme a success?".*

Step 2: brainstorming
We conducted the brainstorming via an online form that was open for four weeks. We asked the respondents to write down everything they perceived to be an effective element of X-Fittt 2.0. The respondents (9 public health practitioners, 1 participant) had to be as detailed and clear as possible, by using only short phrases or key words. Respondents received a reminder when they had not filled out the form after two weeks. Eventually, ten respondents (Figure 7.1) filled out the form and came up with 135 effective elements.

Step 3 and 4: clustering and scoring
Two researchers deduplicated the 135 listed effective elements to 90 elements. We numbered each unique effective element and printed them on small cards. We combined the small cards with effective elements in one package with an instruction letter and 20 empty A4 sheets, and sent the packages to all respondents. The instruction letter explained that the respondents first had to cluster all effective elements using the small cards and empty A4 sheets. Instructions for clustering were: a) to cluster the elements in a way that made sense to them, b) to use every element only once, c) to cluster more than one element per cluster, d) to form more than one cluster, and e) to cluster all elements. Respondents were requested to stick every cluster of effective elements to a separate A4 sheet, and to label each cluster. Finally, we asked respondents to score all effective elements as to importance using a scoring sheet containing a Likert-like scale (1 = not important at all, 5 = very important) for each element. Eventually, nine

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respondents (8 public health practitioners, 1 participant) sent the A4 sheets and the scorings back to us (Figure 7.1).

Step 5: analysing

For the analysis, we used the steps as described by Kane & Trochim (2007) [27]. First, we entered the complete list of effective elements, and all clusters and scores received from the respondents into the Concept Systems Global MAX (CS Global MAX) software [28]. Then, the software created a point map using multidimensional scaling, locating every effective element as an individual point on a map. Elements closer to each other were more likely to be sorted together. After that, hierarchical cluster analysis grouped the individual elements into clusters of similar elements. Two researchers reduced the number of clusters from 20 to 4 within the software, evaluating every next merge of two clusters. Bridging scores per cluster indicated the level of homogeneity for each cluster (0 = homogenic, 1 = heterogenic). When a newly formed cluster after merging two clusters resulted in a too heterogenic cluster, indicating no more coherence, we stopped merging and reached the final cluster solution of nine 9 clusters. We then used the respondents' importance scores to develop a cluster rating map, showing mean importance per cluster, and labelled each cluster (Figure 7.2).
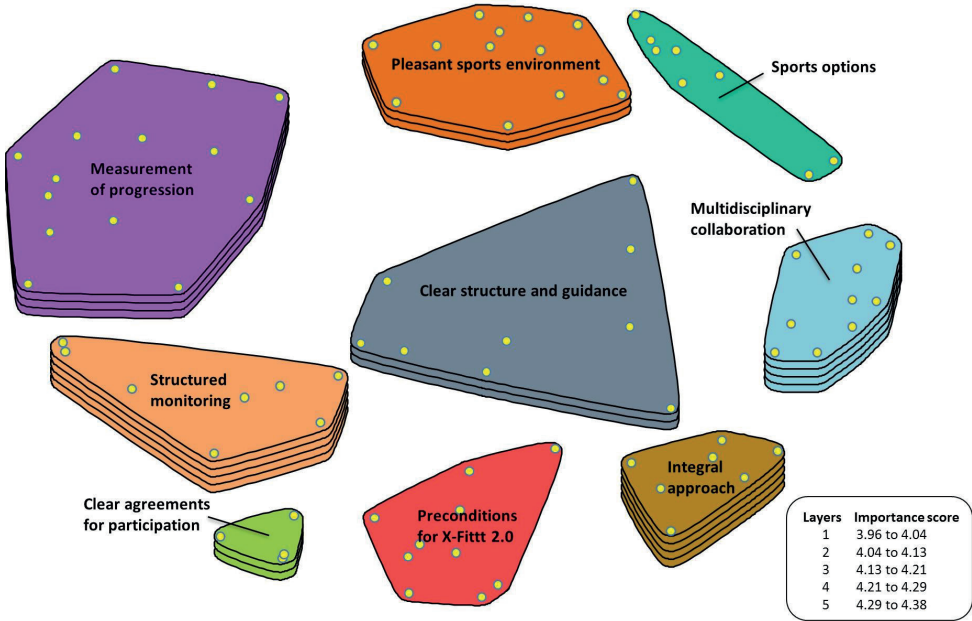
Figure 7.2 Cluster rating map as developed using Concept Systems Global MAX [28].

Step 6: discussing and interpreting
We invited the respondents for a two-hour group meeting, in which eventually four public health practitioners participated (Figure 7.1). As preparation, they received the point map, a list of all effective elements as clustered in the final cluster solution, and the cluster rating map one week before the group meeting. Respondents discussed every individual cluster to determine whether there were any deviating effective elements, whether there was something missing, and whether they were correctly labelled. During this discussion, clusters were merged, added, and reformulated, and elements were moved, reformulated, removed, merged, and added. The group meeting has been recorded and the recording has been used in the processing of the results. After the group meeting, the researchers reformulated the cluster labels into guidelines that could be used in practice.

Results

After the analysis, it appeared that the clusters '*sports options*' and '*preconditions for X-Fittt 2.0*' were least important, and that the clusters '*structured monitoring*', '*multidisciplinary collaboration*', and '*integral approach*' were most important (Figure 7.2). Elements that scored lowest on importance (3.11 out of 5) were element 3: '*List to fill out all information from the physical test for left and right side of the body*' and element 18: '*One sports coach and one intern on a group of 12 participants during the sports sessions (2 sets of eyes are better than 1)*' (Table 7.1). The highest importance score (4.89 out of 5) was given to element 41: '*Combined lifestyle intervention: approach with sports/physical activity, diet, physical checks by physiotherapist*'.
    During the group meeting, the clusters of effective elements have changed due to merging, adding, and reformulating clusters, and moving, reformulating, removing, merging, and adding elements (Appendix 7.A).

Adaptations to the clusters
The clusters '*structured monitoring*' and '*measurement of progression*' were merged into one cluster labelled '*monitoring*', as these two clusters covered the same kind of elements. The respondents also created a new cluster '*recruitment*' with five of the effective elements, to stress the importance of attention for recruitment in X-Fittt 2.0.
    The respondents relabelled some clusters when the label did not represent the content of the cluster. For instance, the cluster '*multidisciplinary collaboration*' was relabelled '*internal multidisciplinary collaboration (within X-Fittt 2.0)*', because this cluster covers the collaboration within X-Fittt 2.0 and should be distinguished from collaboration with stakeholders outside X-Fittt 2.0.

Adaptations to the effective elements
For almost all clusters, elements were moved to another cluster. For instance, the respondents moved several elements to the cluster '*preconditions for X-Fittt 2.0*', such as element 54: '*Separate room for intakes*'. On the other hand, they relocated most of the

elements from the original cluster *'preconditions for X-Fittt 2.0'* to other clusters. For instance, element 24: *'Easy to read and complete information leaflet'* was moved to the cluster *'monitoring'*.

The respondents reformulated some elements to make them more specific. For instance, element 12: *'Structure in the first 12 weeks'* was reformulated to *'Structure in the first 12 weeks (sports sessions and appointments with professionals)',* and element 21: *'Low costs'* into *'Low costs for participants'.* Element 59: *'Safe environment'* could, according to the respondents, be interpreted in two ways: a physically safe environment with appropriate expertise to save someone's life in case of an emergency, or a socially safe environment where people feel at ease and do not feel ashamed of their body. As respondents felt that the latter applied to this element, they reformulated element 59 to *'Socially safe environment'.*

Some elements were not really suitable for the target population of citizens with a low SES, so the respondents removed them from the final list of effective elements. For instance, element 25: *'An information meeting (optional)'* was removed, as the target population is not interested in an information meeting, according to the respondents.

Some elements were merged. For instance, element 28: *'First intake with lifestyle coach, then intakes with physiotherapist and dietitian'* and element 35: *'Intake (acquaintance)'* were merged and then reformulated into element 92: *'First meeting/intake with lifestyle coach, then intakes with physiotherapist and dietitian, to make sure all questions have been answered'.*

The respondents added one effective element to the final list, namely element 97: *'Fixed coordinator/contact person within X-Fittt 2.0'*, as they considered it to be important that someone should coordinate and take the lead within the intervention. This person is the main contact person for all public health practitioners involved in X-Fittt 2.0. No importance score is available for this element, as it was not part of step 4 of the CM process.

Overview of clusters and active elements

Due to the adjustments of the respondents to the clusters and elements (Appendix 7.A), the group meeting resulted in slightly different clusters, containing 72 effective elements (Table 7.1). The cluster labels were reformulated into definitive labels that contain guidelines that can be used in practice (Table 7.1). For instance, the cluster *'preconditions for X-Fittt 2.0'* was reformulated into *'make sure the preconditions for X-Fittt 2.0 are established'.*

Table 7.1. Effective elements, clusters, and importance scores of X-Fittt 2.0 as developed during the group meeting of step 5 of the CM process, ranked by importance score.

Effective elements		Importance*
1	**Offer proper monitoring**	**4.44**
84	Prevent relapse by offering useful tools for after the programme has ended that do not only focus on sports	4.78
5	Valid measurements according to protocol	4.67
34	Diet with focus on long term perseverance instead of short term goals	4.67
72	Participants set concrete goals	4.67
29	Main goal is changing lifestyle and becoming fitter, instead of losing weight and dieting	4.44
13	Weekly weighing on the same scale	4.33
24	Easy to read and complete information leaflet	4.33
40	Diet (checks by dietitian or lifestyle coach)	4.33
83	Start and end measurements to monitor results on physical and psychological level	4.33
89	Intake, intermediate measurements, final measurements	4.33
20	Multiple checks at different times	4.22
92	First meeting/intake with lifestyle coach, then intakes with physiotherapist and dietitian, to make sure all questions have been answered	4.22
2	**Develop internal multidisciplinary collaboration (within X-Fittt 2.0)**	**4.32**
4	All public health practitioners are on the same page	4.78
53	Multidisciplinary collaboration of sports coaches, lifestyle coaches, physiotherapists, dietitians	4.67
6	Specialised and educated public health practitioners (sports coaches, lifestyle coaches, physiotherapists, dietitians)	4.44
88	Committed public health practitioners who do a little extra for each other and the participants	4.11
78	Sufficient communication between public health practitioners involved (sports coaches, lifestyle coaches, physiotherapists, dietitians)	4.00
75	Contact with lifestyle coach via phone and e-mail	3.89
97	Fixed coordinator/contact person within X-Fittt 2.0	
3	**Develop external intersectoral collaboration (within the municipality)**	**4.25**
16	The same information for everyone (e.g., to municipalities and to participants)	4.44
93	Sufficient communication between all public health practitioners involved, including physical meetings	4.33
45	Fixed main contact person for participants	4.22
42	Network (including public health practitioners from primary care and neighbourhood teams) that helps with recruiting participants	4.00
4	**Offer structure and sufficient guidance throughout X-Fittt 2.0**	**4.24**
12	Structure in the first 12 weeks (sports sessions and appointments with public health practitioners)	4.44
47	Mapping available sports and physical activity options after the first 12 weeks	4.44
11	One format for the programme (using one version)	4.33
17	Individual attention	4.33
77	Lifestyle coaches use motivational interviewing during conversations with participants	4.33
81	Good follow-up after the first 12 weeks (e.g., continuing sports sessions in the same group)	4.33
22	Working towards independency	4.22
86	Long-term guidance by lifestyle coach (2 years)	4.11
76	Fixed short period of sports sessions: 12 weeks	4.00
80	Confidential advisor	3.89

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Effective elements		Importance*
5	**Make well-defined agreements for participation in X-Fittt 2.0**	**4.22**
14	Expectation management towards the participants	4.44
30	Mandatory requirements for participation	4.44
33	Well-defined agreements with participants about non-compliance	4.44
48	Contract should also include obligations from the side of the organisation of X-Fittt 2.0	4.00
91	Well-defined and achievable contract for participants: agreements about consequences of non-compliance and early drop-out	3.78
6	**Offer a suitable physical activity programme in the first 12 weeks**	**4.17**
23	Good build-up of sports sessions to prevent injuries	4.67
26	Sports sessions in a group	4.67
57	Participants can indicate their maximum load and exercise at their own level	4.56
58	Appropriate sports and physical activity options	4.56
96	Experienced sports coach with affinity for the target population	4.22
51	Sufficient variation in sports sessions	4.22
65	Preferably one sports coach	4.00
95	Minimum of 8 (social support from group) and maximum of 10 (sufficient guidance and attention) participants per group	3.95
36	Attention to group processes and atmosphere during the sports sessions	3.78
18	1 sports coach and one intern on a group of 12 participants during the sports sessions (2 sets of eyes are better than 1)	3.11
7	**Offer a pleasant and accessible sports environment**	**4.17**
59	Socially safe environment	4.67
15	Easily accessible: everyone is equal	4.44
46	Friendly atmosphere in sports centre	4.44
19	Making 'having fun' important	4.22
70	Participants motivate each other	4.22
71	No 'macho culture' in sports centre (few body builders and girls in crop tops, etc.)	4.22
66	Sports centre with a variety of members	4.11
10	Social contacts	4.00
31	Minimum of 2 trainings sessions per week	3.78
61	Sports centre is located in the neighbourhood, close to participants' homes	3.56
8	**Use sufficient and proper recruitment strategies**	**4.05**
63	Intrinsically motivated participants	4.56
67	Lifestyle coach checks whether motivation of participants is sufficient	4.33
68	Sufficient amounts of time, money and effort for good recruitment and selection of participants	4.00
2	Invitation letter	3.78
52	Recruitment: contact by phone with people who want to participate	3.56
9	**Make sure the preconditions for X-Fittt 2.0 have been established**	**4.04**
41	Combined lifestyle intervention: approach with sports/physical activity, diet, physical checks by physiotherapist	4.89
87	Proper equipment for measurements (scale, measuring tape, skinfold calliper, etc.)	4.56
82	Proper room for intakes with dietitians and physiotherapists	4.33
54	Separate room for intakes	4.22
62	Weekly weighing	4.11
94	Group sports session in a large, separate room with the right equipment	3.95

Effective elements		Importance*
37	Collaboration with the municipality	3.89
21	Low costs for participants	3.33
3	List to fill out all information from the physical test for left and right side of the body	3.11

* Importance scores indicate mean importance of clusters and elements, based on the scores given by the individual respondents (1 = not important at all, 5 = very important). For newly merged elements (91-97), mean importance of the two merged elements is displayed.

Discussion

In this case study, we used CM to unravel the effective elements of the Dutch CLI X-Fittt 2.0. This resulted in 72 effective elements clustered into nine meaningful clusters, which are presented as guidelines that can be useful for practice. Our clusters of effective elements show similarities with previous research findings [15, 19–21], but differ from earlier findings by focusing on CLIs for citizens with a low SES, being more comprehensive and usable in practice, and by indicating the importance of the different elements.

Our study has been the first to indicate the effective elements of a CLI for citizens with a low SES. In one other study, a Delphi study, Nagelhout et al. (2018) investigated the preconditions of more general lifestyle interventions for people with a low SES [20]. These preconditions are similar to some of the effective elements found in our study, such as the costs and location of the intervention, as well as elements concerning guiding participants within the intervention.

Furthermore, our overview of effective elements is more comprehensive than previous overviews. For instance, the Knowledge Centre for Sport Netherlands identified 12 effective elements of CLIs for the general population [19], compared to the 72 effective elements in our research. Another study, by Morgan et al. (2016), listed inactive adults' barriers to and facilitators for adhering to exercise referral schemes [21]. These are more or less similar to our effective elements focusing on tackling barriers to and stimulating facilitators for being physically active, especially in our clusters *'offer structure and sufficient guidance throughout X-Fittt 2.0', 'offer a pleasant and accessible sports environment',* and *'offer a suitable physical activity programme in the first 12 weeks'.* Additionally, our list also includes clusters of elements concerning the organisation of X-Fittt 2.0, such as clusters on recruitment, preconditions, and collaborations. Our overview is also more extensive and detailed than the checklist of good practice characteristics of diet and PA interventions as proposed by Horodyska et al. (2015) [15]. For instance, one of the characteristics of Horodyska and colleagues is 'ongoing support from stakeholders secured', compared to our more precise element 86: *'long-term guidance by lifestyle coach (2 year)'.* Another result that our research adds to existing literature is our cluster *'make well-defined agreements for participation in X-Fittt 2.0'.* X-Fittt 2.0 public health practitioners stressed that a contract between participants and public health practitioners is important to ensure that everyone knows what to expect from each other and to know what the consequences are for non-compliant and early

drop-out participants. They experienced that many participants are not compliant to X-Fittt 2.0 and drop out of the programme early, a problem other researchers studying lifestyle interventions for citizens with a low SES also encountered [29, 30].

A final difference as compared to previous studies is the scoring of individual elements on importance (from 1: least important, to 5: most important), which determined the final clusters' importance scores. The importance scores varied somewhat between clusters, ranging between 4.04 for the cluster *'make sure the preconditions for X-Fittt 2.0 have been established'* and 4.44 for the cluster *'offer proper monitoring'.* During the group meeting, however, the respondents indicated that the lowest scoring cluster *'make sure the preconditions for X-Fittt 2.0 have been established'* was most important, as the preconditions are essential to start a CLI. As in previous research [31, 32], the scores thus helped to gain insight into nuances concerning the results, since it facilitated the discussion on importance of the different clusters.

Strengths & limitations

Our study identified effective elements of a CLI for citizens with a low SES, using the CM method. Due to the individual participation of respondents during steps 2, 3 and 4 in the CM process, the final product reflects the individual input of all respondents. This has the advantage that the contribution of all respondents was equal. Although CM was useful for our research aim, a few methodological issues regarding the *bridging scores* emerged, related to the group meeting and the use of the CM results.

After analysis, the bridging scores give an indication of the degree of heterogeneity within a cluster. Five of the nine clusters, including the three most important ones (*'offer proper monitoring'*, *'develop internal multidisciplinary collaboration (within X-Fittt 2.0)'* and *'develop external intersectoral collaboration (within the municipality)'*), had a fairly high score (> 0.5) prior to the group meeting, indicating higher heterogeneity. However, these scores were not used in this study to determine the number of clusters in the cluster map. We found that applying the bridging scores did not add value to our approach to the CM method, in which we discussed and adapted the cluster map with clusters and elements during the group meeting. During the group meeting, the respondents reflected on the analysis' cluster solution to ensure that the overview of effective elements of X-Fittt 2.0 represents the ideas of the respondents. We used the results from the analysis (multidimensional scaling and hierarchical cluster analysis) as input for the group meeting to start the discussion. Our respondents merged and reformulated clusters, formed a new cluster, and moved, reformulated, removed, merged, and added effective elements when they felt that would improve the overview of the effective elements of X-Fittt 2.0. According to Kane & Trochim (2007), respondents can change or rearrange the cluster map during the group meeting until it makes sense to them [27]. In contrast to our study, other studies show limited changes during this step: deciding on the number of clusters, naming clusters, and/or identifying regions of related clusters [33–37].

In the group meeting, also in-depth insight into the meaning and importance of elements became clear. For instance, element 59: *'safe environment'* could be interpreted

in different ways, which might have influenced the clusters of the individual respondents in step 3. Some respondents interpreted this element as a physically safe environment, while most other respondents, interpreted this element as a socially safe environment. Since formulations of effective elements always run the risk of diverse interpretations, this might need some extra attention while revising the brainstorming list in future research. The group meeting provided the opportunity to make an inventory of these diverse interpretations and to reach consensus, which has been valuable and has created a more precise overview. We recommend including such an extensive group meeting in future research.

As this study is a case study, the results cannot be blindly copied to any CLI for citizens with a low SES. What works for X-Fittt 2.0 in Arnhem might not automatically work in other municipalities, as the context is different [14, 18]. Furthermore, the number of respondents was small (n=10, group meeting: n=4) and, besides the nine public health practitioners, only one X-Fittt 2.0 participant participated. Except for the dietitians, every discipline within X-Fittt 2.0 (coordinators, sports coaches, physiotherapists and lifestyle coaches) was represented during the CM process and in the group meeting. However, because only one participant of X-Fittt 2.0 partially participated in the research, the question is whether the results sufficiently reflect the citizens with a low SES. The X-Fittt 2.0 participant had an 'perspective from experience' and emphasised what helped him/her during X-Fittt 2.0. The public health practitioners had more of an 'organisational' perspective and emphasised mainly practical matters. In follow-up research it is therefore recommended to involve more participants with a low SES.

To obtain more results that can be generalised, the recommendation is to repeat the research with a larger group of respondents involved in different CLIs for citizens with a low SES, thereby broadening the focus of the research. This could be useful to obtain a broad and more general view on the effective elements of CLIs for citizens with a low SES. This in turn can also be used for other CLIs, such as BeweegKuur and SLIMMER, as these are not specifically developed for citizens with a low SES [10].

Conclusions

The main goal of this study was to gain insight into the effective elements of CLIs for people with a low SES. We did this using the CLI X-Fittt 2.0 as a case study and using the CM method. This resulted in an overview of 72 effective elements of X-Fittt 2.0, which were clustered into nine meaningful clusters: 1) *'offer proper monitoring'*; 2) *'develop internal multidisciplinary collaboration (within X-Fittt 2.0)'*; 3) *'develop external intersectoral collaboration (within the municipality)'*; 4) *'offer structure and sufficient guidance throughout X-Fittt 2.0'*; 5) *'make well-defined agreements for participation in X-Fittt 2.0'*; 6) *'offer a suitable physical activity programme in the first 12 weeks'*; 7) *'offer a pleasant and accessible sports environment'*; 8) *'use sufficient and proper recruitment strategies'*; and 9) *'make sure the preconditions for X-Fittt 2.0 have been established'*. According to our respondents, the preconditions of a CLI, such as a proper location with proper equipment, are most important to start the programme. For the continuity of healthy behaviours, long term guidance by a lifestyle coach and useful tools to prevent relapse

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are most important. Using CM to unravel the effective elements of X-Fittt 2.0 was useful and structured. It is recommended to use this method in future research focusing on a group of respondents that has a broader view of CLIs. The overview of active elements presented in this study provides a first exploration of the active elements of a CLI for citizens with low SES. This provides a valuable basis for follow-up research into the effective elements of CLIs for citizens with low SES.

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Chapter 8

Effective elements of care-physical activity initiatives for adults with a low socioeconomic status: a concept mapping study with health promotion experts

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Abstract

In care-physical activity (care–PA) initiatives, primary care and sports are combined to stimulate PA among adults at risk of lifestyle related diseases. Preliminary results from Dutch care–PA initiatives for adults with a low socioeconomic status (SES) indicate a decrease in participants' body weight and an improved quality of life, however, the elements that make these initiatives successful are yet to be identified. In total 19 Dutch health promotion experts participated in our concept mapping (CM) of the effective elements of care–PA initiatives for adults with a low SES. The experts identified 111 effective elements of these initiatives, which were grouped into 11 clusters, focusing on: 1) approaching participants within the care–PA initiative; 2) barriers experienced throughout the initiative; 3) long-term implementation; 4) customizing the care–PA initiative to the target population; 5) social support; 6) structure and guidance; 7) the professionals within the care–PA initiative; 8) the accessibility of the care–PA initiative; 9) targeted behaviour and progression; 10) recruitment and administration; and 11) intersectoral collaboration. CM was useful for creating a valuable overview of these effective elements. Our results could be used to improve the development and implementation of future care–PA initiatives for adults with a low SES.

Introduction

Regular physical activity (PA) is associated with an increased life expectancy and has been proven to be beneficial for both physical and mental health [1, 2]. For instance, PA reduces the risk of developing several (chronic) illnesses and conditions such as obesity, high blood pressure, and type 2 diabetes, and improves mood, reduces anxiety and depression, and ultimately improves the quality of life and perceived health [1, 2]. Yet, a large proportion of the population engages in too low levels of PA to profit from these health benefits [3].

Especially people with a low socioeconomic status (SES), which is determined by education, income, and occupation, tend to participate in too little PA. In 2017, roughly half of Dutch adults with a higher level of education did not comply with the Dutch recommended PA guidelines, compared to 65 percent of adults with a lower level of education [4]. Furthermore, people with a low SES tend to have less knowledge about what a healthy lifestyle entails, and often perceive more barriers in changing one's lifestyle [5–7]. As such, SES is an important determinant of health inequalities [1, 8, 9]. Given this, the promotion of PA and a healthy lifestyle is especially relevant for this group.

Lifestyle interventions, such as care–PA initiatives, seem to be a promising strategy for promoting PA and healthy lifestyles [10–12]. Care–PA initiatives are collaborations between professionals in the primary care sector (e.g., general practitioners, physiotherapists, and dietitians) and professionals in the PA sector (e.g., sports clubs or fitness centres) to encourage or maintain a healthy lifestyle and improve health among individuals who are at risk of a chronic disease, such as diabetes or obesity [13]. Care–PA initiatives have shown promising results [11, 12]. However, most of these initiatives have not been developed specifically for adults with a low SES and may therefore not be effective in establishing sustainable lifestyle changes among this group [14]. A tailored approach may be needed for care–PA initiatives to be effective among this group [11]. But care–PA initiatives specifically for people with a low SES are scarce and to date, no complete overview of the elements that make them successful, or the effective elements, is available. However, research shows that people with a low SES experience specific barriers that need extra attention in care–PA initiatives, such as lack of financial resources, knowledge, or facilities, or not enjoying exercise [5–7]. To better fit the development and implementation of care–PA initiatives to the needs of adults with a low SES, we need further insight into the effective elements.

A small number of papers have previously identified the effective elements for lifestyle or PA interventions for a general population [15, 16]; for instance, Horodyska et al. (2015) identified the *'good practice characteristics'* of diet and PA interventions, developing a checklist that could be used by health promotion scientists to check the presence of these characteristics in interventions [15]. Furthermore, Morgan et al. (2016) described the facilitators of and barriers to being physically active among the general population, which could be translated into effective elements [16]. More recently, Nagelhout, Verhagen, Loos, & de Vries (2018) identified the preconditions for

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developing lifestyle interventions (not care–PA initiatives) for people with a low SES, such as 'connecting to the perceptions, motivations, desires, and needs of the target population' [17]. In a previous Dutch study, we identified the effective elements of a care–PA initiative in the Netherlands for adults with a low SES , but these results were limited to one specific local care–PA initiative [18].

In summary, the previous literature has provided some insights into the effective elements of lifestyle interventions, with only one study focusing on a local care–PA initiative for adults with a low SES [18]. Thus, the effective elements of care–PA initiatives for adults with a low SES on a broader scale have not been addressed. To obtain a list of effective elements that could be useful in the development and implementation of care–PA initiatives for adults with a low SES, we aimed to identify the effective elements of care–PA initiatives for adults with a low SES in the Netherlands, based on the experiences of health promotion experts (HPEs).

Definition and classification of effective elements
The current literature refers to effective elements in several ways, such as active ingredients [19, 20], good practice characteristics [15], and core components [21]. These terms all refer to the parts of an intervention or approach that are essential for its effectivity. Here, we use the definition proposed by Wartna, Vaandrager, Wagemakers, & Koelen (2012), which states that effective elements are *"the essential components that make the intervention work. Without these effective elements, the intervention does not work or is less effective"* [22].

Effective elements are generally divided into two categories [22]: *general effective elements* that improve the effectivity of interventions, regardless of the type of intervention, goal, context, or target population (e.g., using trained professionals), and *specific effective elements* that improve the effectivity of certain interventions with a specific goal, context, or target population, but not of others (e.g., the number of sessions needed for sustained behavioural change in people with a low SES). General effective elements can therefore be seen as the core of the intervention, whereas specific effective elements are more context specific. In the present research, we aimed to make a distinction between general and specific effective elements in the present research.

Methods

To explore the effective elements of care–PA initiatives for adults with a low SES in the Netherlands, we invited a diverse group of Dutch HPEs with expertise in care–PA initiatives for people with a low SES to begin a dialogue on the effective elements of such initiatives. We used concept mapping (CM) [23], since this innovative method reflects the input of the individual HPEs based on their expertise, while still presenting the results in a single overview. The CM process consists of six sequential steps: 1) preparing; 2) brainstorming; 3) sorting; 4) rating; 5) analysing; and 6) discussing and interpreting (Figure 8.1).

Concept mapping of effective elements of care–PA initiatives

1. Preparing
Inviting HPEs and developing focus question

n = 35

2. Brainstorming
Online survey for HPEs to identify the effective elements

n = 17

3. Sorting
Forming clusters by HPEs

n = 15

4. Rating
(not important at all) 1 – 5 (very important)

n = 15

5. Analysing
Multidimensional scaling and hierarchical cluster analysis

6. Discussing and interpreting
Group meeting with HPEs

n = 11

Figure 8.1 Flow chart of the CM process used to identify the effective elements of care–PA initiatives for people with a low SES, based on the workflow outlined by Kane and Trochim (2007) [23]. For each step, the number of HPEs that generated valid inputs is indicated.

CM is a group-based approach that integrates qualitative and quantitative research components to conceptualise a topic [23]: qualitative (step 2) and quantitative (step 4) input of the participants is analysed with quantitative methods, resulting in a cluster map (step 5), which is the input for a discussion in step 6. As such, CM facilitates group-based research, in which the input of all participants is equally reflected in the end result.

Step 1: preparing
We invited 35 HPEs to participate in the CM steps using purposive sampling [24], based on their relevant expertise in health promotion. This group of HPEs consisted mainly of professionals (e.g., researchers, project managers) working in research and expertise institutes (e.g., universities and knowledge centres) and national and local public health institutes. These professionals were selected because they have a broad view on care–PA initiatives for people with a low SES, based on diverse expertise and

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experiences. Practice professionals, such as sports coaches and physiotherapists, were not invited for this study.

The invitation e-mail to HPEs included a detailed description of the study, including our definitions of care PA initiatives and effective elements (see introduction), and examples of care–PA initiatives and effective elements. One week later, we sent a reminder to all HPEs who had not yet responded and asked whether they could suggest one of their colleagues with similar relevant expertise who we could contact if they could not participate themselves. Participants did not have to participate in both brainstorming and sorting/rating, although this was preferred. Eventually, 19 HPEs representing different sectors and organisations participated in one or multiple steps of our CM process (Table 8.1). Their experience in the public health sector ranged from 1 to 28 years, with a mean of 13 years.

For steps 2 to 5, we used Concept System Global MAX software (CS Global MAX), a web-based software specifically designed to facilitate CM activities (Kane, 2019). Before the brainstorming step, we developed a focus question, which was the main question that we wanted to answer with the CM process: what do you perceive to be the effective elements of care–PA initiatives in the Netherlands for adults with a low SES?

Table 8.1 Primary area of expertise of the HPEs that provided valid input, shown separately for each CM step.

	Brainstorming n=17	Sorting n=15	Rating n=15	Group meeting n=11
Research institute	7	8	8	5
Sports and exercise sector	3	3	3	3
National institute for public health	3	0	1	1
Municipal health services	2	2	2	0
Other	2	2	1	2

Step 2: brainstorming

The HPEs anonymously accessed the CS Global Max software to take part in brainstorming at a time and place convenient to them. We asked them to respond to the focus question with as many effective elements as they thought were important. All the generated elements were visible to the entire group of HPEs to encourage the brainstorming process and to prevent the repetition of elements. HPEs could not remove elements from other HPEs from the list. The HPEs had two weeks to finish the brainstorming step and could re-enter the software as often as they wanted within this time. A total of 17 HPEs completed the brainstorming step.

After those two weeks, two researchers reviewed the complete brainstormed list of 178 effective elements as preparation for the next step. The goal was to create a manageable list of 125 effective elements, since that is the maximum number of statements allowed to be used in the CS Global MAX software in steps 3 and 4 [25]. First, we removed duplicates and combined elements reflecting similar content. Second, we deleted elements that were too vague, such as 'variation', since it was unclear what

sort of variation was meant. Third, we clarified the language to ensure understanding across all HPEs. Finally, the elements were randomly numbered to reduce bias in the next step.

Step 3: sorting

Again, the HPEs individually accessed the CS Global Max software, but this time they could not see each other's inputs. We instructed them to sort the 125 brainstormed effective elements into clusters that made sense to them. The full instructions were to sort all elements; form more than one cluster; include each element in one cluster only; not form an 'other' cluster; and not sort by priority or value. There was no limit to the maximum number of clusters. We also instructed them to assign a name to each cluster. The HPEs had four weeks to complete the sorting. A total of 19 HPEs started the sorting, which was completed by 16 of them. Fifteen HPEs clustered all effective elements according to our instructions, ranging from 6 to 18 clusters (median: 9).

Step 4: rating

After the sorting, the HPEs had to rate each effective element on its importance using a five-point Likert-like scale (1 = not important at all, 5 = very important). Again, they did this individually and could not see each other's ratings. The HPEs had four weeks to complete the rating. A total of 16 HPEs started the rating, of whom nine rated all the effective elements and six rated more than 120 of the 125 elements, which was sufficient for the analysis.

Step 5: analysing

The analysis was conducted using the CS Global MAX software. First, we used multidimensional scaling to create a point map, in which all effective elements were plotted on a two-dimensional graph that represents the similarity between them (the dots in Figure 8.2, results section). The proximity of the elements on the map represents the frequency with which the effective elements were clustered together by the individual HPEs, with closer effective elements being more frequently clustered together, indicating that they are considered to be more similar to each other. The degree to which the point map represents the input data was measured using a stress value [23].

Next, we used a hierarchical cluster analysis to create a cluster map (the clusters in Figure 8.2, results section) based on the point map. The aim of this analysis was to generate relatively homogenous clusters, based on the distances between the effective elements. Effective elements with a high level of coherence (closer to each other on the point map) are likely to end up in the same cluster [23]. Three researchers evaluated the cluster maps that resulted from the hierarchical cluster analysis, sequentially decreasing the number of clusters included. We started with 19 clusters, which decreased in rounds of the software combining the two most similar clusters. After each round, we discussed whether the merging of the two clusters resulted in a sufficiently homogeneous cluster. We repeated this process until we reached a consensus over the final number of clusters (11). Thus, the researchers decided on the final number of clusters in the cluster map,

informed by the merging of two clusters in each round. Since there was a lot of variation among the names that the HPEs had assigned to their clusters, we instead assigned the letters A to K to the clusters.

Finally, the rating information is visualised in the cluster rating map (Figure 8.2, results section). This map shows the average importance of each cluster, indicated by the number of layers; for instance, a cluster with the maximum of five layers can be seen as relatively more important than a cluster with three layers.

Step 6: discussing and interpreting

To interpret the results, we invited all HPEs that took part in the previous steps (n=19) for a three-hour group meeting after the analysis, with 11 HPEs ultimately participating. The discussion strengthens the results and ensures that the results are in line with the views of the HPEs. As preparation for the group meeting, we provided them with the point map, the cluster rating map, and the list of effective elements as clustered in the cluster map. During the group meeting, we divided the HPEs into three groups, each facilitated by one of the researchers. The groups evaluated and discussed a subset of the 11 clusters; group 1 reviewed three clusters, group 2 reviewed four clusters, and group 3 reviewed three clusters. One cluster (cluster D, Appendix 8.A) was accidentally not included in the group discussions and was instead reviewed and discussed in the subsequent plenary discussion.

We asked the HPEs to evaluate the effective elements within each cluster. They could make as many remarks as they wanted, such as whether clusters should be merged or divided, or whether elements should be moved to another cluster, or whether elements should be removed. The cluster rating map was used to visualise the arrangement of effective elements. We also asked the groups of HPEs to decide on a name for each of the clusters they evaluated. After these separate discussions, a plenary session was held with all 11 HPEs. We discussed the most notable changes each group of HPEs had suggested and the names that were assigned to the clusters. Furthermore, there was an opportunity for the HPEs to comment on clusters other than the ones they discussed during the subdiscussions. After this plenary discussion, we asked each of the three groups of HPEs to divide the effective elements into elements specific to people with a low SES (i.e., specific effective elements) and elements more generally applicable to every target population (i.e., general effective elements). For this task, group 1 focused on elements 1–40, group 2 on elements 41–80, and group 3 on elements 81–125.

We recorded all discussions and transcribed them verbatim after the group meeting. All suggestions and remarks that the HPEs made were recorded by the researchers in an overview document. We used this information to finalise the concept map. To do this, we discussed and processed the data in three researcher meetings. In these meetings, we decided on the effective elements in each cluster, the reformulation and exclusion of effective elements, and on the final cluster solution, based on the consensus between the three researchers. We excluded elements that met one or more of our exclusion criteria: the element is too vague; the element is unfocused; or the element is covered by (an)other element(s). After making these adaptations, we rewrote the cluster names

suggested by the HPEs into guidelines for use in practice. The final cluster importance was calculated, taking the mean of the ratings of all individual effective elements.

Results

Cluster map

The 125 effective elements that were sorted and rated by the HPEs were grouped into an overall cluster map consisting of 11 clusters during the analysis in CS Global MAX performed in step 5 (Figure 8.2 and Appendix 8.A). Our stress value was 0.29, indicating a good match between the input data and the processed multidimensional scaling data. The mean cluster importance, on a five-point scale, ranged from 2.92 for cluster K to 3.92 for cluster H, indicating that the most important effective elements are located in cluster H.
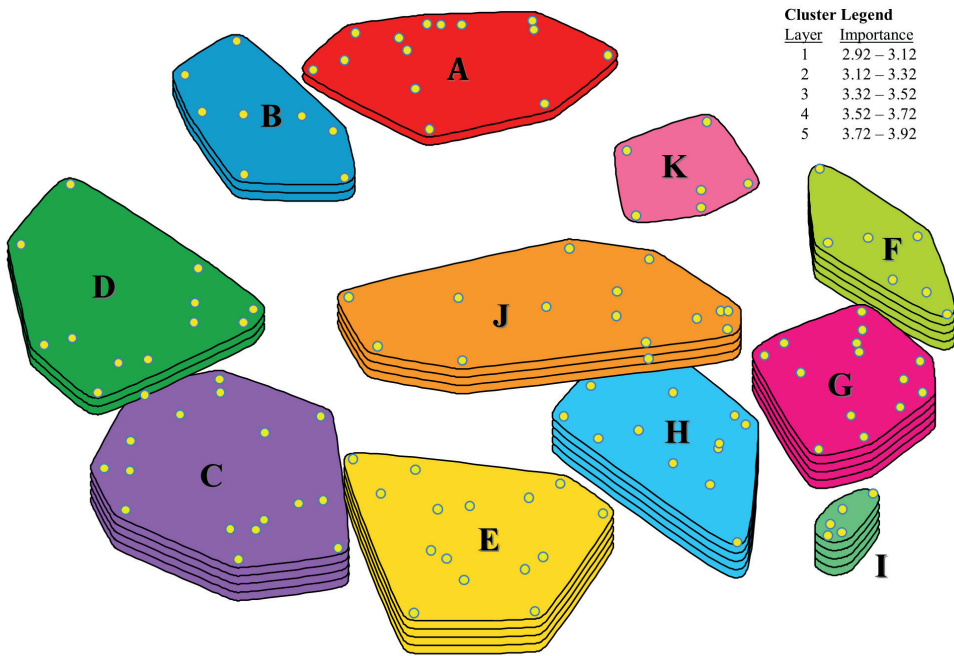
Figure 8.2 Cluster rating map based on the clusters and importance ratings made by the HPEs, as developed using CS Global MAX software (Step 5) [25]. The dots represent the different effective elements. The number of layers is indicative of the mean cluster importance, based on the importance ratings of the individual effective elements.

Interpretation

Effective elements

The 125 effective elements and 11 clusters presented in the cluster rating map (Figure 8.2) were input for step 6, a group meeting to discuss and interpret these preliminary

results. During the group meeting, the HPEs proposed the merging, splitting, or removal of certain elements. Four elements were merged into two new ones because they reflected similar content; for example, *'affordable care–PA initiative'* and *'low cost but not free of charge'* were merged into a new element (*'affordable care–PA initiative, but not free of charge'*). Furthermore, two elements were each split into two distinct effective elements; for instance, *'respond to the expectations of the target group and ensure they know what to expect'* was split into *'respond to the expectations of the target group'* and *'ensure that the target group knows what to expect'*. Eventually, 14 elements were removed because they were too vague, covered by (an)other element(s), or unfocused/cluster-transcending. One example was that the HPEs indicated that it was unclear what was meant by *'healthcare professionals participate too'*, with one HPE querying, *"does it mean that the GP also participates in the care–PA initiative, or does it mean that primary care should be involved in its organisation?"*. Furthermore, *'social support'* covered the entire cluster on social support, which is why this element was removed. After these changes by HPEs, we ended up with 111 unique effective elements.

Clusters

The HPEs also proposed the merging of clusters that were presented in the cluster rating map (Figure 8.2). First, they proposed the merging of clusters A and K. Second, they proposed the merging of clusters C and E and their subsequent division into four new clusters. Finally, the HPEs proposed the merging of clusters G, H, and J, which were also then divided into four new clusters. During the researcher's meetings, we merged some of these newly created clusters because they reflected similar content. Ultimately, the final 111 unique effective elements were clustered into 11 clusters, which the researchers labelled based on the content of the clusters (Table 8.2). The mean cluster importance ratings changed due to the alterations of the elements and clusters, with the new ratings ranging from to 3.18 to 4.28.

As shown in Table 8.2, cluster 1, *'approach the participants in a positive, stimulating, and encouraging way'*, consists of eight effective elements that indicate how the professional should approach the participants of the care–PA initiative, such as *'provide fun, warmth, and togetherness'* (element 125). This cluster was rated as most important (4.28). According to the HPEs, cluster 2, *'anticipate the barriers that participants will experience throughout the care–PA initiative'* (importance: 3.99), covers elements that take into account the barriers that participants encounter during the care–PA initiative, such as *'barriers such as fear and pain should be taken into account'* (element 41). Cluster 3, *'embed the care–PA initiative in existing local structures to ensure long-term implementation'* (importance: 3.88), includes elements that stress the importance of long-term viability, such as *'embed the care–PA initiative in the neighbourhood'* (element 15). Cluster 4, *'customise the care–PA initiative to the target population'* (importance: 3.81), focuses on the ways to ensure the care–PA initiative fits the target population to improve its effectiveness; for instance, *'the care–PA initiative must fit in with the experiences, motives, wishes, and needs of the target population'* (element 19). Cluster 5, *'encourage social support within the care–PA initiative'* (importance: 3.79), contains nine effective elements related

to the support that participants receive from other group members throughout the care–PA initiative; for example, *'use the power of the group'* (element 7). Cluster 6, *'offer structure and sufficient guidance throughout the care–PA initiative'* (importance: 3.77), comprises elements concerning the design of the care–PA initiative, and guidance in particular; for instance, *'lots of personal guidance and verbal communication'* (element 74). Cluster 7, *'use competent and motivated professionals'* (importance: 3.75), focuses on the characteristics of the professionals included in the care–PA initiative, including effective elements such as an *'enthusiastic coach'* (element 10). Cluster 8, *'make the care–PA initiative accessible for the target population'* (importance: 3.67), concerns how easily potential participants can access the care–PA initiative, including the elements of the location, costs, and its compatibility with daily activities. Cluster 9, *'target multiple health behaviours and awareness, and monitor progression'* (importance: 3.59), concerns what happens within the care–PA initiative, such as *'confirm and strengthen self-confidence'* (element 68). Cluster 10, *'make recruitment and administration easy'* (importance: 3.35), is the smallest cluster and contains elements such as *'recruiting using key figures within the community'* (element 116). Cluster 11, *'develop intersectoral collaboration with a fixed coordinator'*, is the largest cluster, comprising 18 effective elements that focus on collaboration within the care–PA initiative, such as *'ensure a good collaboration between primary care, the care–PA initiative, and sports and physical activity options'* (element 54). It was rated as the least important (3.18).

Classification of effective elements

In step 6 of the CM process, the HPEs were asked to classify the effective elements as being either general or specific, based on the distinction in Wartna et al. (2012) [22]. However, they found it difficult to decide how to classify many of the elements identified in this study. Rather than using only the categories of general and specific elements, the HPEs came up with four categories that form a spectrum from general to specific (Table 8.2):

- General (G): important for all target populations
- General, but more for low SES (GLS): important for all target populations, but extra important for people with a low SES
- Vulnerable people (VP): important for vulnerable people in general (low SES, disabled, chronic illness, less gifted, etc.)
- Low SES (S): important only for people with a low SES (determined by education, income, and occupation)

According to the HPEs, most effective elements could be classified as being general, although some were of special importance for people with a low SES, such as *'empower participants' self-efficacy'*. This is something that could be useful for all participants but is slightly more important for people with a low SES to maintain their results. Furthermore, they indicated that some elements that seemed specific for people with a

low SES would also suit vulnerable people in general, such as *'lots of personal guidance and verbal communication'* and *'reduce physical thresholds'*.

Table 8.2 Final clusters identified in the CM process, reflecting the 111 effective elements of care–PA initiatives for adults with a low SES according to Dutch HPEs, ranked by importance. Each effective element was specified as either general (G), general, but more for low SES (GLS), vulnerable people (VP), or low SES (S).

Clusters and their constituent effective elements		Importance*	Classification general/specific**
1	**Approach the participants in a positive, stimulating, and encouraging way**	**4.28**	
125	Provide fun, warmth and togetherness	4.67	G
124	Experience of success: give participants the idea that they are progressing; celebrate small successes	4.53	G
53	Stimulate the target group in a positive way	4.33	G
37	Positive instead of patronizing approach	4.27	G
57	Give honest feedback and sincere compliments	4.27	G
110	Listen carefully to the participants	4.20	G
101	Relationship of trust	4.13	G
60	Emphasise enjoyment and relaxation	3.80	G
2	**Anticipate the barriers that participants will experience throughout the care–PA initiative**	**3.99**	
14	Take into account barriers specific to people with a low SES (e.g., debts, language skills, stress, and the characteristics of their social and physical environments)	4.47	S
95	Take into account the limitations of the target population (physically, socially, financially)	4.20	GLS
118	Approach dropouts and try to keep them involved (including in the case of injuries, etc.)	4.13	G
44	Respond to and protect against potential barriers that people will encounter	3.87	VP
46B	Know the problems the participants are dealing with	3.87	S
41	Take into account barriers such as anxiety and pain	3.73	G
102	Take into account (potential) negative previous experiences with physical activity	3.67	G
3	**Embed the care–PA initiative in existing local structures to ensure long-term implementation**	**3.88**	
58	Ensure that continuation of the care–PA initiative is guaranteed and that participants can either move on to regular activities after the first (physical activity) program or continue their current activities	4.20	VP
15	Embed the care–PA initiative in the neighbourhood	4.14	G
23	Continuity	4.00	G
64	Embed the care–PA initiative in existing structures	3.87	VP
4	Connect to existing activities	3.60	G
30	No transfer period (for instance, the participant should be able to start in a new physical activity group immediately after their first physical activity program)	3.47	G
4	**Customise the care–PA initiative to the target population**	**3.81**	
19	Connect to the perceptions, motives, wishes, and needs of the target group	4.53	S

Clusters and their constituent effective elements		Importance*	Classification general/specific**
25	Invest in getting to know the target group: what are the bottlenecks preventing them from being physically active, what are their wishes and needs, etc.	4.47	S
103	Think from the perspective of the participants, not from the perspective of the professional	4.13	G
29	Take into account the daily worries and living situation of the participant	4.07	S
80A	Respond to the expectations of the target group	4.07	G
91	Take into account the (other) social norms and (lack of) social support	3.93	GLS
113	Take into account the existing social norms regarding physical activity within the target group	3.93	GLS
46a	Take into account and be aware of the participants' social environment	3.87	S
107	Materials must match the health skills and degree of literacy of the target group	3.87	S
108	Focus on the skills needed to participate	3.47	G
89	Materials must be pre-tested among the target group	3.33	G
40	Involve family members	3.00	S
13	Make a distinction between people with limited mobility and people with exercise disabilities; consider referring the second group to a physiotherapist	2.87	G
5	**Encourage social support within the care–PA initiative**	**3.79**	
17	Encourage fun and social contacts, allowing contact with fellow patients to develop	4.27	S
7	Use the power of the group	4.07	G
78	Familiar faces	3.93	S
20	Group bonding within the care–PA initiative	3.80	G
49	Social contacts of the target group	3.80	VP
66	Work with groups instead of individuals	3.80	VP
34	Focus on social benefits (involve family members, use small groups)	3.60	G
45	Social purpose as a core element	3.60	G
94	Make use of buddies	3.20	GLS
6	**Offer structure and sufficient guidance throughout the care–PA initiative**	**3.77**	
74	Lots of personal guidance and verbal communication	4.27	VP
83	Personal approach	4.13	G
32	The care–PA initiative must focus on small achievable (behavioural) goals	4.07	G
69	Very practical; small steps; short assignments	4.07	VP
80B	Ensure the target group knows what to expect	4.07	G
67	The care–PA initiative must focus on concrete activities and less on knowledge transfer	4.00	S
104	Recognizability (for instance, always the same supervisor)	4.00	S
114	Use role models (for reaching and informing participants)	3.93	S
75	Let the target group influence/feel they have an influence on the design of the activities/care–PA initiatives	3.87	G
81	Personal contact	3.87	G

8

	Clusters and their constituent effective elements	Importance*	Classification general/specific**
90	Offer the target group (the feeling of) freedom of choice about behaviour, feelings, and thoughts	3.73	G
115	Small-scale	3.60	GLS
12	Informal	3.47	G
28	Intensive guidance	3.13	G
63	Allow the target group to develop and execute the care–PA initiative	3.13	G
11	Implementation by peers	3.00	S
7	**Use competent and motivated professionals**	**3.75**	
10	Enthusiastic coach	4.60	G
84	Suitable supervisors/coaches who make people feel comfortable and to whom people can relate	4.40	S
56	Adequate supervisors/coaches for exercise activities in the neighbourhood	4.21	G
71	Invest in training for professionals to strengthen their competencies	3.43	G
62	Use professionals only for coaching and to offer advice and conceptual input	3.00	G
36	Local exercise coach (someone like themselves)	2.87	S
8	**Make the care–PA initiative accessible for the target population**	**3.67**	
122	Clear and simple language, suitable for people with low levels of literacy	4.27	S
92	Location of the care–PA initiative must be close to the daily lives of the participants	4.07	GLS
127	Affordable care–PA initiative, but not free of charge	4.07	S
33	Very low threshold: it should be possible to start exercising the day the decision is made to do so (for instance, directly after a care–PA session, plan an exercise session with the care–PA group)	4.00	G
72	Familiar location, where participants already come for something else (e.g., school, community centre, general practice)	4.00	VP
120	Do not label the participants as 'people with a low SES'	4.00	S
55	Give the target group the opportunity to combine the care–PA initiative with daily activities, such as work and school	3.87	G
82	Reduce physical thresholds	3.67	VP
39	'Outreaching' towards the target group	3.60	G
70	Take the neighbourhood's safety into account	3.47	G
111	Necessary basic conditions must be in place (e.g., childcare)	3.43	GLS
100	For physical activities, groups should preferably consist of persons of the same age, gender, and physical fitness	2.67	G
126	Small financial compensation for participation, for instance with resources from the municipal fund	2.53	S
9	**Target multiple health behaviours and awareness, and monitor progression**	**3.59**	
76	Empower the target group to be able to exhibit/execute desired behaviours outside the care–PA initiative	4.27	VP
68	Confirm and strengthen self-confidence	4.20	G
112	Empower participants' self-efficacy	4.07	GLS
38	Focus on physical activity, not just on sports	3.93	G

Clusters and their constituent effective elements		Importance*	Classification general/specific**
21	Personal goals	3.73	G
50	Monitoring of and feedback on results (and progression)	3.73	G
51	Increase awareness of fitness/physical condition	3.53	G
117	Make progress visible using simple tests/measurements	3.50	G
61	Combine with nutritional advice	3.07	G
42	Explain the link for participants between physical activities and the objective: brisk walking becoming fitter, exercises becoming stronger, etc.	2.93	S
79	Transfer knowledge about healthy lifestyles in general	2.57	S
10	**Make recruitment and administration easy**	**3.35**	
18	Key figures and intermediaries can be used in the recruitment process: word-of-mouth advertising	3.80	S
116	Recruit using key figures within the community	3.73	S
106	Build up personal contact in the recruitment phase	3.47	GLS
105	Make information available on paper	2.40	G
11	**Develop intersectoral collaboration with a clear coordinator**	**3.18**	
73	Warm handover from healthcare provider to sports provider	3.93	VP
6	Intersectoral collaboration with the active participation of local stakeholders	3.80	G
65	Collaborate with professionals from the social/welfare domain (neighbourhood teams)	3.80	VP
1	Involve the municipality regarding policies concerning this particular target group	3.73	S
59	Ensure that professionals from the healthcare and physical activity sectors know and understand each other, and know where to find each other	3.67	VP
54	Ensure a good collaboration between primary care, the care–PA initiative, and sports and physical activity options	3.53	VP
123	Use the care sport connector to realise the connection with local sport and physical activity	3.47	GLS
85	Link with well-being/social work	3.27	GLS
27	Have knowledge of the social map	3.20	G
43	Integrated programming, in conjunction with, or as part of, other activities or projects	3.13	VP
48	Have collaboration between the relevant parties at the policy level	3.07	G
88	Combine the care–PA initiative with debt assistance	3.07	S
31	Involvement of the care sport connector/combination officer	3.00	G
16	Referral from the general practitioner as a reliable expert	2.93	S
24	Feedback to healthcare professionals	2.71	G
35	General-practice-based nurse specialist as an intermediary	2.40	G
47	Collaborate with a mental coach	2.33	VP
52	Presence of a case manager	2.27	VP

* Importance ratings show the (mean) importance of the clusters and effective elements, based on the ratings provided by the individual HPEs (1 = not important at all, 5 = very important). For the new elements (126 and 127) developed by merging two other elements, we used the mean rating of the two constituent effective elements.

** Classification: G = general; GLS = general but more for low SES; VP = vulnerable people; S = low SES.

8

Discussion

In this study, Dutch HPEs participated in a CM approach to unravel the effective elements of care–PA initiatives for adults with a low SES in the Netherlands. After the online brainstorming, clustering, rating, and analysing phase, the final group meeting provided us with detailed insights into what the HPEs perceive to be the effective elements of care–PA initiatives for adults with a low SES. This resulted in the identification of 111 unique effective elements, which were grouped into 11 clusters (Table 8.2). All clusters had a mean importance score above 3 however, indicating that none of the clusters were seen as unimportant by the HPEs. The most important cluster was *'approach the participants in a positive, stimulating, and encouraging way'* (4.28 on a five-point scale), while the least important cluster was *'develop intersectoral collaboration with a fixed coordinator'* (3.18 on a five-point scale).

A comprehensive overview of effective elements

Our study is unique for its overview of effective elements of care–PA initiatives for people with a low SES, since it has been the first to provide such a comprehensive overview. This overview differs from previous studies in both scope and method. For instance, Horodyska et al. (2015) identified the good practice characteristics of diet and physical activity interventions in an umbrella review [15]. Seven of our clusters show some similarities with the list they developed, namely *'anticipate the barriers that participants will experience throughout the care–PA initiative'*, *'customise the care–PA initiative to the target population'*, *'encourage social support within the care–PA initiative'*, *'offer structure and sufficient guidance throughout the care–PA initiative'*, *'use competent and motivated professionals'*, *'make the care–PA initiative accessible for the target population'*, and *'target multiple health behaviours and awareness, and monitor progression'*. However, comparing our results to the study of Horodyska et al. (2015) is quite difficult [15]. Their list was described as a checklist that could be used to check whether interventions contain characteristics to make them successful (e.g., 'target behaviour well defined, specified, and adjusted to target population' (Horodyska et al., 2015, pp. 7 [15]), while our list of effective elements contains more specific elements that could also be used in the development of care–PA initiatives (e.g., *'connect to the perceptions, motives, wishes, and needs of the target group'* (element 19)). Furthermore, our overview adds elements concerning how to approach participants within the care–PA initiative, how to stimulate long-term implementation, how to improve recruitment and administration, and how to develop intersectoral collaboration.

Morgan et al. (2016) investigated participant's views on the barriers to and facilitators of being physically active in a systematic review [16]. Five of our clusters show similarities with the themes they identified, namely support from professionals, friends, and family; accessibility; the content of the care–PA initiative; and tailoring the care–PA initiative to the needs, abilities, and preferences of participants. Our study differs from the work of Morgan et al. (2016) in that we also identified clusters that focus on embedding the

care–PA initiative in existing structures, offering structure and guidance, and developing intersectoral collaboration [16].

In addition to these reviews, Nagelhout et al. (2018) performed a study that is more similar to our research, but with a focus on the preconditions needed for developing lifestyle interventions for people with a low SES [17]. They used the Delphi method and involved experts in lifestyle change for people with a low SES. Around 30 of our effective elements were very similar to the preconditions they identified, which were mostly grouped in our clusters focused on customizing the care–PA initiative to the target population, offering structure and guidance, and making the care–PA initiative accessible for the target population, such as *'take into account the daily worries and living situation of the participant'* (element 29). Since Nagelhout et al. (2018) focused on the preconditions for developing interventions, their results did not include actual program characteristics, such as *'combine with nutritional advice'* (element 61) in our results [17].

In our previous CM research (Mulderij et al., 2019), we developed a more practice-based list of effective elements, focusing on one specific care–PA initiative [18]. That research included public health practice professionals, with a more practice-based view than the HPEs in the current research. Therefore, that study included effective elements that were not included in the current research, such as elements regarding specific resources for monitoring participants' progression, characteristics of the PA facilities, and the type of PA. The previous research also included two distinct clusters for internal and external collaborations, instead of one cluster for intersectoral collaboration obtained in the current research. On the other hand, the HPEs identified, in line with our recent research, clusters of effective elements that focus on the accessibility of the care–PA initiative for the target population and recruitment. New in the current research compared to our previous research are clusters on the customisation of the care–PA initiative to the target population, the anticipation of barriers to participation for people with a low SES, and the embedding of the care–PA initiative in local structures for sustained implementation.

The results of the current and previous studies could be useful in policymaking and in the development and implementation of care–PA initiatives for adults with a low SES, especially if this knowledge is merged into a single list of effective elements. The evaluation of the usability of this list would first be important to ensure its effectiveness.

Classification of effective elements

HPEs indicated that many of the effective elements could be classified as general elements, since they apply to all populations and not just people with a low SES; for instance, the HPEs themselves said they would appreciate fun, warmth, and togetherness (element 125) in a care–PA initiative, stressing that this element is not specific to people with a low SES. Furthermore, some of the effective elements were considered to be important for all populations, but more for people with a low SES, while other elements were thought to be more important for vulnerable people in general, not specifically for people with a low SES (Table 8.2). In short, elements specific for people with a low SES often cover a personal approach, such as *'take into account the daily worries and living*

situation of the participant' (element 29), while general effective elements are often more practical, such as *'connect to existing activities'* (element 4). As such, these results suggest that it is hard to distinguish effective elements into general or specific, but that they are on a spectrum ranging from general to specific for low SES.

To gain more insight into the categorisation of clusters of effective elements, we used the different existing categorisations of Van Yperen et al. (2015), Blase & Fixsen (2013), and Wartna et al. (2012) [21, 22, 26]. To incorporate all categorisations, we composed one comprehensive framework: the Classification of Effective Elements (CEE) framework (Figure 8.3). In line with our findings on general and specific elements, the framework also includes a cluster-transcending spectrum ranging from general to specific. The CEE framework consists of four categories:

1. Health promotion context (HPC), which constitutes the context outside the scope of the intervention, such as the interactive processes in which stakeholders are involved and their norms and values
2. Intervention context (IC), which contains elements such as the target population, location, and costs of the care–PA initiative
3. Intervention structure (IS), which consists of the detailed design elements that shape the care–PA initiatives within its context, such as duration of the care–PA initiative and the number of sessions
4. Intervention foundation (IF), which includes concrete descriptions of what is done in the care–PA initiative, including the change strategies used and the theory of the intervention

The interpretation of the clusters in the CEE framework according to these four categorisations turned out to be challenging. Most of the clusters (1, 5, 6, 7, 9, and 10) could subjectively fit into multiple categories, particularly because IF and IS seem to be intertwined. Five clusters (1, 5, 6, 7, and 9) could be classified as both IF and IS. For instance, cluster 9, *'target multiple health behaviours and awareness, and monitor progression'*, could be classified as IS, since this cluster includes elements that could be defined as design elements that shape the care–PA initiative, such as *'combine with nutritional advice'* (element 61). However, this cluster could also be classified as IF if this example element would be defined as an intervention strategy. In addition, cluster 10 could be classified as both IS and IC, because it contained elements that concern the design of the care–PA initiative, but also elements regarding its adjustment to the target population.

We found that the IC and HPC were more distinct. Three clusters (2, 4, and 8) could be classified as IC, because they focused on adjusting the care–PA initiative to the target population. Two clusters (3 and 11) could be classified as HPC, as they focus on how the care–PA initiative should be embedded in local structures and how different local stakeholders should collaborate. The IC and HPC differ for each municipality, and can explain why a care–PA initiative is not effective in all contexts [27]. Contexts include external factors within the environment in which the care–PA initiative is carried out,

which can influence its implementation and effectivity [28]; hence, when using the results of our study to develop and implement care–PA initiatives for people with a low SES, it will be important to tailor the care–PA initiative to the HPC and IC and to regularly check the implementation and effectivity of the initiative.

It would be interesting to further investigate the classifications made according to this framework in future research, including a discussion with HPEs. This could also facilitate the further development of the framework, which might make it more suitable as guidance for research on the effective elements of care–PA initiatives.
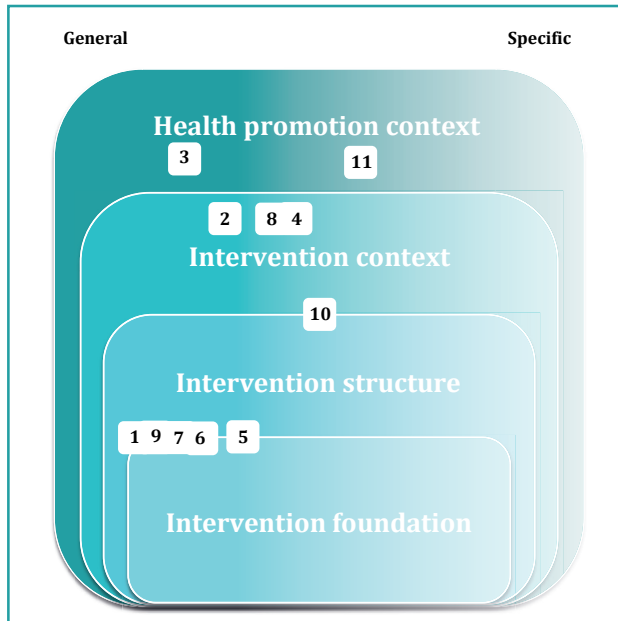
Figure 8.3 The classification of the clusters of effective elements of care–PA initiatives for adults with a low SES, as determined using the Classification of Effective Elements (CEE) framework. The clusters are arranged on a spectrum from general to specific for people with a low SES, based on the number of general vs. specific effective elements contained within each cluster.

Strengths and limitations

As far as we know, our study is the first to identify a comprehensive overview of the effective elements of care–PA initiatives for adults with a low SES. The CM approach, which has not been used by others in previous studies on the effective elements of lifestyle interventions, proved to be useful for achieving this. The HPEs individually accessed the CS Global MAX software at the time and place of their choosing to perform the brainstorming, sorting, and rating steps, which might have improved the response rate. Additionally, the individual brainstorming sessions ensured that the wording and terminology used by the HPEs remained largely intact. Furthermore, the end result of the software analysis consisted of a single overview of effective elements, in which

the input of the individual HPEs was equally reflected. After the software analysis, the group meeting in particular provided us with more detailed insights into the thoughts of the HPEs, which further improved the overview of the effective elements. Despite these strengths, there are also some methodological issues we would like to discuss, namely the purpose of the group meeting; the subdiscussions of the clusters; the alterations made during the group meeting; the interpretation of the effective elements; and the variety of HPEs included in this study.

We used the group meeting to obtain a deeper understanding of the effective elements of care–PA initiatives for adults with a low SES by discussing the results with the HPEs and adapting the effective elements and clusters to match their views. In most other studies using the CM method, this group meeting was less participatory than our group meeting; for instance, other researchers used the group meeting only to allow respondents to decide on the number of clusters and the labelling of the clusters [29, 30]. Nevertheless, some studies used an approach similar to our study, in which elements were merged, split, moved, or removed, and clusters were merged and split after the analysis, although this was done by the researchers instead of the respondents [31]. This suggests that even though Kane and Trochim (2007) described guidelines for the use of the CM method, these guidelines are interpreted differently by different researchers, especially regarding the group meeting [23]. We believe that our approach of step 6, where HPEs interpreted and discussed the effective elements and clusters of the software analysis (step 5), improved the final results. The final results are completely based on the views of HPEs and are, in our opinion, therefore of better use in practice. Because the HPEs had so much influence after the software analysis, we think that the results represent the views of the HPEs better compared to the preliminary results.

We held subdiscussions of a selection of the clusters with smaller groups of HPEs, as we did not have time to discuss all clusters with all HPEs. Despite this, we sent the analysis results to the HPEs one week prior to the group meeting. Most HPEs used this information to prepare the group meeting. Therefore, the HPEs were also able to comment on clusters other than those they discussed in the smaller groups. The plenary discussion after these subdiscussions was useful for collecting all the inputs of the HPEs and ensuring that they had all contributed to the end result.

The high number of alterations made to the effective elements and clusters during our group meetings could be explained by the proximity of the different effective elements (Figure 8.3); for example, some clusters (J and H, and D and C) show some overlap, indicating that the elements within these clusters are quite similar. Eventually, the alterations resulted in a more representative overview of the effective elements of care–PA initiatives for adults with a low SES, which is why we recommend the inclusion of group meetings in future research using CM.

The clarity of the effective elements is a key factor in the success of CM [23]. Although we tried to synthesise the input of the HPEs after the brainstorming session, during the group meeting they indicated that some elements were ambiguous or not clear to them, which may have led to different interpretations of some of the effective elements. This could mean that individual HPEs would have sorted and rated the elements differently

if they were formulated less ambiguously. Extra attention should therefore be spent on reducing ambiguity in future research, for instance, by checking the interpretations of the elements in the brainstorming list with a (sub)group of CM respondents.

Although our study included HPEs from a broad range of disciplines, no public health practice professionals, such as general practitioners, dietitians, or physiotherapists, participated. In our previous study [18], public health professionals involved in one particular care–PA initiative were included, providing a more practice-based perspective with focus on the effective elements of that specific initiative. In contrast, our present study focused on a more aggregated level of effective elements. The perspective of the HPEs was from indirect knowledge of the care–PA initiatives for people with a low SES, obtained by working in science for example, and thus they had limited experience with the direct practice of these initiatives. To obtain a broader perspective on the effective elements of care–PA initiatives for adults with a low SES, we therefore recommend the inclusion of both HPEs and public health practice professionals in future research. Furthermore, no participants of the care–PA initiatives were included in the CM process. The perspectives of participants with a low SES differ from those of the HPEs, and could be of added value. Although it can be challenging to involve them in research, it is recommended that these participants are included in future studies.

Conclusions

The aim of this study was to explore the effective elements of care–PA initiatives for adults with a low SES. In total, 111 unique effective elements were generated and sorted into 11 clusters, which we present as guidelines that could be used in practice. The CM method appeared to be a useful and structured approach for obtaining these results, with the important advantage that the inputs of the individual HPEs are equally represented in the final results. Furthermore, the group meeting contributed to the overview of effective elements representing the views of the HPEs. Future CM research focusing on the effective elements of care–PA initiatives should include both HPEs and public health practice professionals, as well as participants of care–PA initiatives, to provide a more comprehensive overview of the effective elements. Future research should also further investigate the classification of the effective elements according to the CEE framework.

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Chapter 9

Citizen preferences regarding the public funding of projects promoting a healthy body weight among people with a low income

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Abstract

Overweight and obesity are a growing problem, especially among people with a low income. Policymakers aspire to alleviate this problem by implementing publicly funded projects. This study has three aims: to explore citizen preferences regarding the public funding of projects promoting a healthy body weight among people with a low income; to identify whether such preferences differ between citizens with a low income and those with a higher income; and to identify the reasons underlying these preferences. We conducted a Participatory Value Evaluation (PVE) among 1053 Dutch citizens to achieve these aims. In an online choice experiment, respondents were asked to advise on the implementation of eight different projects that encourage a healthy weight among citizens with a low income, with a total resource constraint of 100,000 euros. The projects were 1) lifestyle coaching including sports; 2) lifestyle coaching without sports; 3) local sports coach; 4) fruit and vegetable boxes; 5) bariatric surgery; 6) improving the living environment; 7) courses on healthy lifestyles; and 8) sports vouchers. We used the *"Multiple Discrete-Continuous Extreme Value"* model to estimate the preferences of respondents towards these eight projects. Fruit and vegetable boxes and sports vouchers were the most popular projects, while bariatric surgery was least popular. Respondents with a low income tended to spend less of the budget than respondents with a higher income. Respondent arguments for the choices they made were qualitatively analysed using inductive content analysis. They often mentioned the value judgements 'importance', 'healthiness' and 'usefulness', as well as project costs and efficacy, as reasons for their decisions. Policymakers could use the results to ensure their decisions on the allocation of public funding to projects that encourage a healthy weight among people with a low income are aligned with citizen preferences.

Introduction

The number of overweight and obese people is increasing, particularly for people with a low socioeconomic status, who often have a low income [1, 2]. Projects or activities that promote a physically active and healthy lifestyle could reduce the risk of becoming overweight and developing related chronic diseases, such as diabetes [3, 4]. However, people with a low income often experience their limited financial resources as a barrier to participating in health-promoting projects [5]; therefore, it is crucial that such projects are provided for little to no cost for this segment of the population, for instance by using funding from municipalities or healthcare insurances. To decide which health-promoting projects should be funded, the current body of literature has largely focussed on their (cost-) effectiveness [6–13]; however, to improve public support for the funding of health-promoting projects, it is also particularly important to take into account the preferences of the general public, including people with a low income, since the public eventually pays for the projects through taxes and premiums. Policymakers could use this information to align their decisions on the allocation of public funding with citizen preferences.

To elucidate this topic, our main research question is: what are citizen preferences regarding the public funding of projects that promote a healthy body weight among people with a low income? People with a low income are the proposed beneficiaries of these projects, and may hold different views about the projects compared with people with higher incomes [14–16]; thus, our second research question is: to what extent do citizen preferences regarding the public funding of those projects differ between people with different incomes? Finally, to understand which aspects of projects shape citizen motives to prefer some projects over others, our third research question is: why do citizens prefer certain projects that promote a healthy body weight among people with a low income over others?

To answer the research questions, we conducted a Participatory Value Evaluation (PVE). A PVE is a preference elicitation method originally developed for the evaluation of physical infrastructure projects [17, 18], but more recently the method has also been deployed for measuring Dutch citizens' preferences towards public health policies, such as (the impacts of) relaxation options for lockdown measures imposed during the COVID-19 pandemic [19]. The essence of a PVE is that citizens are put in the shoes of a policymaker. In an online environment they see the projects the government is considering; the concrete impacts of the projects from which the government can choose; and the constraint(s) that the government faces (e.g., a limited budget). Subsequently, citizens are asked to provide a recommendation to the government in terms of the projects the government should choose, subject to the constraint(s). Individual preferences over (the impacts of) projects can be determined by feeding these choices into behaviourally informed choice models [19]. The obtained preferences can be used to rank government projects in terms of their desirability.

PVEs are closely related to so-called labelled discrete choice experiments (DCEs), in the sense that both preference-elicitation techniques allow individuals to express

preferences towards specific projects as well as project impacts. A first fundamental distinction is that participants in a DCE express preferences by selecting a single project, whilst participants in a PVE can select a bundle of projects [19]; hence, participants in a PVE can evaluate bundles of projects in relation to each other. A second fundamental distinction is that participants in a PVE express preferences not only towards specific government projects, but also towards the allocation of scarce public resources [19]. PVE participants make a continuous choice regarding the extent to which they think public resources should be allocated and discrete choices about whether to include specific projects in the bundle they recommend to the policymaker. The main contribution of this study is that it is the first to use a PVE to explore citizen preferences regarding the public funding of projects that promote a healthy body weight among people with a low income, which could inform policymakers when making decisions regarding budget allocation.

Methods

Instrument
The development of the PVE instrument for this study consisted of several steps (Figure 9.1).

Development of the PVE instrument

- Projects, attributes and attribute values in the PVE
- Selection of the resource constraint
- Development of the PVE instrument
- Pilot testing
- Data collection
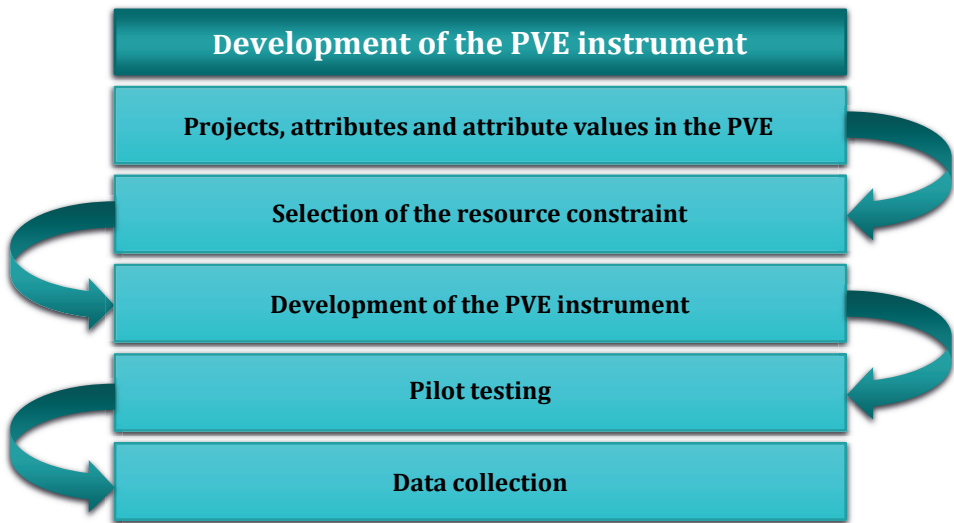
Figure 9.1 Steps taken in the development of the PVE instrument.

Projects, attributes and attribute values in the PVE
Two one-hour brainstorming sessions were held with health promotion experts (n=11) to create a list of possible projects that promote a healthy body weight among people with a low income. This resulted in a shortlist of 17 projects. To ensure that respondents

would not be overburdened with choices, we selected a variety of eight projects to be included in the PVE, based on how often they were mentioned during the brainstorm sessions and based on how unique (i.e., how different from the other projects) they were. For example, we not only selected projects focussing on sports and physical activity (PA), but also those focussing on lifestyle in general or on the environment, including a project outside the health domain. The eight projects we eventually selected were further processed to include all necessary details, such as a description of the project (Table 9.1) and the project's scores on six attributes (Table 9.2). This information was mostly based on comparable existing projects [20]. For each project, the values for these attributes were set by the researchers (Appendix 9.A), as much as possible determined using data from existing projects [20, 21].

Table 9.1 Name and description of the projects included in the PVE

Project	Description
1: Lifestyle coaching including PA	A free 2-year trajectory to improve the health and lifestyle of participants, guided by a lifestyle coach, dietitian and sports coach, including sports sessions in a group.
2: Lifestyle coaching without PA	A free 2-year trajectory to improve the health and lifestyle of the participants, guided by a lifestyle coach and dietitian.
3: Local sports coach	A local sports coach will be appointed for 1 year in neighbourhoods with a high percentage of people with a low income to provide free activities and personal guidance to increase the PA of these citizens.
4: Fruit and vegetable boxes	A free 1-year subscription to weekly fruit and vegetable boxes. Their own contribution is 2.50 euros a week.
5: Bariatric surgery	A free 5-year trajectory in which they receive bariatric surgery.
6: Living environment	Municipal budget for 1 year to improve the public environment of neighbourhoods with a high percentage of people with a low income to make neighbourhoods more attractive for PA outdoors.
7: Courses on healthy lifestyles	Participation in up to four free lifestyle courses a year per participant to help them with improving their lifestyle.
8: Sports vouchers	Free sports vouchers to participate in PA programmes for free or with a discount, or to buy sports clothes (maximum compensation: 225 euros/year).

Table 9.2 Name and description of the attributes included in the PVE

Attribute	Description
Reach	Number of participants in a project.
Total costs	All costs of a project; everything that is paid for with money from the municipality and healthcare insurance companies (which mostly comes from taxes and premiums paid by Dutch citizens).
Costs per participant	Costs of the project, displayed per participant.
Expected weight loss	How much weight loss is expected from participants in the year after the start of the project.
Expected self-rated health before start	Score people give to their own health prior to participation in the project, which can have any value between 0 and 10: 0 means the worst health you can imagine, 10 means the best health you can imagine.
Expected self-rated health after start	Score people give to their own health after participation in the project, which can have any value between 0 and 10: 0 means the worst health you can imagine, 10 means the best health you can imagine.
Expected change in self-rated health	Expected increase in self-rated health due to participation in the project. It is also possible that the score does not change.

Resource constraint of the PVE

We indicated a resource constraint of 100,000 euros in the PVE, which was based on the costs of the projects as indicated in the PVE (Appendix 9.A). This resource constraint meant they were not be able to select all projects, ensuring respondents were forced to choose between them.

PVE instrument in the webtool

The PVE instrument was developed in a webtool. The PVE started with an explanation of the study aim, asking the respondents to sign an informed consent, and requesting some information about their socio-demographic and health characteristics. The respondents then entered the choice task, which began with an explanation (Box 9.1). In addition, the Dutch poverty lines were provided [22]. Since the PVE was conducted during the COVID-19 pandemic, we indicated in the PVE that the respondents could assume that in all projects, the (locally) applicable COVID-19 measures and guidelines would be taken into account. Subsequently, the eight projects and the corresponding attribute values were introduced. The respondents could use this information to decide which projects they would fund while respecting the resource constraint. They could, if allowed by the resource constraint, select each project more than once.

Different attribute values were provided to the respondents to gain more insight into citizen preferences concerning the different attributes (Appendix 9.A). Specifically, each participant faced one of 64 versions of the PVE experiment. Each version was composed of the same projects for all respondents, but they differed in terms of their attribute values and individual costs.

We followed an experimental design process aimed at selecting combinations of attribute values and costs for each of the 64 versions, such that the correlation between each attribute and the individual cost of the projects was minimised. A detailed explanation of the experimental design process for this PVE was provided by Mouter, Hernandez & Itten (2021), who describe a study in which a similar process was adopted [19]. After the choice task, the respondents were asked to provide a written motivation for their selection of projects, an explanation for not selecting the other projects, and any final remarks.

Pilot testing

A draft version of the PVE was tested using a convenience sample (n=20). We asked them to fill out the PVE and to provide us with feedback about it, such as whether it was easy or difficult to use the webtool, and whether the text and explanations were understandable. Based on participant feedback, we improved the formulation of the questions, the clarity of the explanatory texts, and the functionality of the webtool.

Data collection

We asked a survey company, Kantar Public, to draw a randomly selected sample representative of the Dutch adult population in terms of age, gender and education

level. In total, 1053 respondents completed the choice task, of whom 295 (35%) had a low income.

Data analysis

Quantitative data analysis

To analyse the choices of the respondents, we used a Kuhn–Tucker-type choice model developed by Bhat (2008), known as the Multiple Discrete-Continuous Extreme Value (MDCEV) model [23]. This model aims to elicit the preferences of individuals towards the consumption (or expenditure) of a finite number of goods, subject to a budget constraint. In the context of this PVE, the MDCEV model is suitable when individuals are asked to jointly choose whether each project should be funded and whether the budget should be totally consumed (multiple discrete choices) and how many times each project should be funded and how much available budget should not be spent (multiple continuous choices).

We used the MDCEV framework as described in Bhat (2008), which in turn is based on the consumer's problem of microeconomic theory [23]. Under this framework, it is assumed that individuals choose to conduct the projects that maximise their utility. In turn, this utility depends on the (un)observed characteristics of each project, as well as the amount of unspent budget and individual-specific characteristics. The utility function assumed by Bhat's MDCEV incorporates the so-called satiation and translation parameters. The former allows us to capture the extent to which individuals prefer not to add additional quantities of a project, while the latter recognises that individuals may prefer not to advice some projects. Both types of parameters cannot be estimated jointly, thus we selected the so-called γ-profile, in which only the translation parameters are estimated, while the satiation parameters are fixed to zero [23].

We used the estimated parameters of the MDCEV to assess the preferences for projects using the procedure described by Dekker, Koster & Mouter (2019) [24]. This method determines the composition of the bundle of projects that satisfies the available budget and maximises the expected utility of society by enumerating the utility of all feasible combinations of projects. A drawback of this procedure is that, since each project can be selected more than once, the number of possible combinations to evaluate is huge. We therefore established limits for the maximum quantities of each project using the method described by Pinjari and Bhat (2011), which is aimed at determining a point estimate of the optimal quantities and expenditures of the MDCEV models [25]. Since this latter method can deliver non-integer optimal quantities, we decided to use it only as input for the procedure described by Dekker et al. (2019) [24].

Qualitative data analysis

The qualitative data consisted of respondent motivations for choosing certain projects and reasons for not choosing the other projects. To analyse the project motivations, an inductive content analysis was conducted. Two researchers coded the project motivations for the first 100 respondents using the software programme ATLAS.ti, resulting in 24

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codes. Each project motivation was first coded with the corresponding project number (project 1, project 2, etc.), and then with one or more content codes. After discussing these results, one researcher coded the remaining project motivations. A co-occurrence table was then developed to check the occurrence of the different codes for the different projects. Lastly, we divided the codes into subcodes to distinguish the themes within the codes. We also conducted an inductive content analysis of the reasons for not choosing the other projects. One researcher coded the available data for the first 100 respondents and 30 randomly selected respondents, which resulted in data saturation with 19 codes.

Results

Demographic characteristics

The sample included almost the same number of females and males (Table 9.3). Most respondents were aged between 26 and 65 years old, with the largest group aged between 41 and 64 years old. Furthermore, approximately one third of the respondents had a low education level. Approximately one third of the respondents reported a low net household income (< 2000 euros) and the majority of respondents declared they could (easily) make ends meet. Finally, fewer than 10% of the respondents relied on municipal benefits. The greatest group of respondents (51.1%) had a self-reported BMI of between 18.5 and 25 kg/m^2, while 48.9% were overweight or obese (BMI > 25 kg/m^2). Many respondents (n=695) did not answer the question concerning self-rated health; of those who answered, the majority rated their health≥8.

Table 9.3 Characteristics of respondents

Characteristic	n (%)
Gender	
• Female	525 (49.9%)
• Male	528 (50.1%)
Age	
• 18 to 25 years	145 (13.9%)
• 26 to 40 years	248 (23.8%)
• 41 to 65 years	471 (45.2%)
• > 65 years	179 (17.2%)
• No answer	10
Education level*	
• Low	322 (30.6%)
• Middle	357 (33.9%)
• High	374 (35.5%)
Income	
• Low (< 2000 euros)	295 (35.4%)
• Higher (≥2000 euros)	539 (64.6%)
• I do not know	27
• I prefer not to say	115
• No answer	77

Characteristic	n (%)
Financial situation	
• We cannot make ends meet	61 (6.5%)
• We can make ends meet	371 (39.7%)
• We can easily make ends meet	503 (53.8%)
• I prefer not to say	41
• No answer	77
Receives municipal benefits	
• Yes	81 (8.8%)
• No	839 (91.2%)
• I do not know	28
• I prefer not to say	28
• No answer	77
Body Mass Index (BMI)	
• < 18.5 kg/m^2	48 (5.2%)
• 18.5–24.9 kg/m^2	420 (45.9%)
• 25.0–29.9 kg/m^2	288 (31.5%)
• ≥30.0 kg/m^2	159 (17.4%)
• No answer	138
Self-rated health score [26]	
• 1–3	9 (2.5%)
• 4–7	152 (42.5%)
• 8–10	197 (55.0%)
• No answer	695

* Low education level: leaving after primary school, preparatory secondary vocational education, senior secondary vocational education level one, or the first three years of senior general secondary education or pre-university education; middle education level: leaving after completing senior general secondary education or pre-university education, or senior secondary vocational education level two, three or four; high education level: completed higher professional education or university [27].

Quantitative results

We estimated two specifications of the MDCEV model. The first specification (henceforth referred to as the aggregate MDCEV model) identified the overall preferences for projects and their impacts by estimating a model only with a constant term for each project, and common taste parameters for each impact which describe how the attractiveness of a project is affected by the attributes. The second specification of the MDCEV model (henceforth, the MDCEV model with income effect) incorporated the additional effect of being part of the low-income group on the preferences for each project. For both specifications, we estimated different forms of the MDCEV model (see Bhat (2008) for more details about these different forms [23]). We reported the form with the best model fit (in terms of log-likelihood), also reporting the estimates of the so-called corner solution parameters described in the methodology section, but we do not focus on describing their implications as they do not affect the aims of this study.

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Aggregate MDCEV model

Four out of eight project-specific constants were statistically significant at the 95% confidence level (Table 9.4). The magnitude of these constants represents the extent to which funding the project (i.e., allocating budget to the first unit of a project) increases the utility for the respondent, regardless of the attribute values included in the PVE experiment (i.e., weight loss and self-rated health increase). Thus, a higher-value constant implies that the associated project is more attractive without considering the level of weight loss and self-rated health increase, and vice versa for smaller values. For example, irrespective of the attributes, respondents were more willing to allocate budget to providing sports vouchers, whereas bariatric surgery was the least attractive option.

All taste parameters were statistically significant (Table 9.4); thus, an attribute can be preferred (positive taste parameter) or avoided (negative taste parameter) by the respondents. Taste parameters can be compared with each other in terms of their magnitude by computing marginal rates of substitution (MRS) as the ratio between two taste parameters [24]. The MRS reflects the degree of substitution between two attributes of a project that keeps a respondent indifferent. In this case, the MRS between the two attributes indicated that respondents are willing to exchange 0.47 points of self-rated health (on a 10-point scale) for one kilogram of weight loss, or 1.56 kilograms of weight loss for a one-point increase in self-rated health.

Finally, the value of the estimated taste parameters reflects the extent to which attribute values should increase to ensure that a specific project is socially desirable. For example, the utility losses derived from the negative project-specific constant of bariatric surgery can be outweighed either by a self-rated health increase of 60%, by 126 kilograms of weight loss, or a combination of both.

Table 9.4 Main estimated coefficients of the aggregate MDCEV model.

	Utility function parameters	Satiation/ Translation parameters
Project-specific parameters		
Budget shift	0.0000	–0.4789***
	(fixed)	(0.1343)
1: Lifestyle coaching including PA	–0.2996*	–0.0405
	(0.1512)	(0.0970)
2: Lifestyle coaching without PA	–1.0203***	0.0200
	(0.1562)	(0.1063)
3: Local sports coach	–0.2226	0.3462*
	(0.1558)	(0.1391)
4: Fruit and vegetable boxes	–0.1476	–0.2771***
	(0.1264)	(0.0801)
5: Bariatric surgery	–2.6307***	0.2271
	(0.3143)	(0.1579)
6: Living environment	0.1567	0.1765
	(0.1423)	(0.1128)

	Utility function parameters	Satiation/ Translation parameters
7: Courses on healthy lifestyles	0.1655	0.0135
	(0.1415)	(0.1060)
8: Sports vouchers	0.5030***	0.0346
	(0.1370)	(0.1018)
Taste parameters		
Weight loss	0.0208***	
	(0.0049)	
Self-rated health increase	0.4381***	
	(0.0762)	
Scale		
Scale parameter	1.2033***	
	(0.0264)	
Observations	1053	
Log-likelihood	-7185.7227	
Akaike Information Criterion (AIC)	14329.4454	
Bayesian Information Criterion (BIC)	14225.2980	

Note: Standard errors in parentheses. **Significance codes:** ***$p < 0.001$; **$p < 0.01$; *$p < 0.05$

Optimal bundles of projects for the aggregate MDCEV model

The maximum consumption estimated with the procedure of Pinjari and Bhat (2011) is around 2.5 units [25]. Thus, we defined a limit of three units of each project to compute the optimal bundles using the procedure described by Dekker et al. (2019) [24], and determined the five best bundles of projects that satisfy the limit of 100,000 euros (Table 9.5). The fruit and vegetable boxes appeared in all bundles, with a range of between one and three units per bundle. The sports vouchers also appeared in all bundles, with five single appearances. The other projects included in the optimal bundles were lifestyle coaching with and without PA. The costs of each project bundle were below the budget limit of 100,000 euros, with the optimal bundle costing 85,510 euros.

Table 9.5 Top five optimal bundles of projects. The numbers indicate the frequency of the chosen projects in each bundle, within a budget limit of 100,000 euros.

	1st bundle	2nd bundle	3rd bundle	4th bundle	5th bundle
1: Lifestyle coaching including PA	1	0	1	0	0
2: Lifestyle coaching without PA	0	0	0	0	1
3: Local sports coach	0	0	0	0	0
4: Fruit and vegetable boxes	2	3	1	2	2
5: Bariatric surgery	0	0	0	0	0
6: Living environment	0	0	0	0	0
7: Courses on healthy lifestyles	0	0	0	0	0
8: Sports vouchers	1	1	1	1	1
Bundle cost (euros)	85,510	66,010	77,250	57,740	77,800

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The income effect

To consider differences between respondents with different incomes, we incorporated an indicator variable (the *income effect*) for each respondent that was equal to one if they had a low income, or zero otherwise (Table 9.6). If an income effect is statistically significant, it means that respondents with a low income have a different preference for this particular project than respondents with a higher income. Negative statistically significant income effects imply that respondents with a low income are less likely to prefer this particular project than respondents with a higher income, and vice versa in case of a positive sign. Four projects had a significant negative income effect, namely lifestyle coaching with and without PA, the local sports coach, and the living environment.

Table 9.6 MDCEV results considering differences between respondents with low and higher incomes.

	Project-specific constants	Income effect	Taste parameters	Satiation/ Translation parameters
Budget shift	0.0000			-0.5200***
				(0.1467)
1: Lifestyle coaching including PA	-0.1044	-0.4822**		-0.0025
	(0.1743)	(0.1779)		(0.1087)
2: Lifestyle coaching without PA	-0.8045***	-0.4624*		0.0515
	(0.1801)	(0.1968)		(0.1176)
3: Local sports coach	0.0040	-0.4400*		0.3610*
	(0.1819)	(0.2164)		(0.1535)
4: Fruit and vegetable boxes	-0.0793	-0.2158		-0.2284*
	(0.1474)	(0.1543)		(0.0891)
5: Bariatric surgery	-2.3299***	-0.3962		0.2615
	(0.3500)	(0.2600)		(0.1739)
6: Living environment	0.3494*	-0.4990**		0.2037
	(0.1657)	(0.1930)		(0.1266)
7: Courses on healthy lifestyles	0.3025	-0.2924		0.0318
	(0.1645)	(0.1852)		(0.1175)
8: Sports vouchers	0.5974***	-0.2448		0.0917
	(0.1601)	(0.1744)		(0.1152)
Scale parameter	1.1790***			
	(0.0287)			
Weight loss			0.0195***	
			(0.0053)	
Self-rated health increase			0.4607***	
			(0.0837)	
Observations	834			
Log-likelihood	-5699.9192			
AIC	11341.8385			
BIC	11204.7777			

Note: Standard errors in parentheses. **Significance codes:** ***$p < 0.001$; **$p < 0.01$; *$p < 0.05$

Income differences in the optimal bundles of projects

We observed three slight differences between the two income groups in terms of the quantities of projects appearing in the optimal bundles (Table 9.7). First, respondents with a low income preferred more units of the fruit and vegetable box project to be funded than respondents with a higher income in the first two bundles. Second, respondents with a low income preferred lifestyle coaching including PA in the third and fourth bundle, while respondents with a higher income preferred this project in the first two bundles and the fourth bundle. In terms of bundle costs, respondents with a higher income were generally more inclined to spend a higher share of the budget than respondents with a low income.

Table 9.7 Top five optimal bundles of projects for respondents with low and higher incomes. The numbers indicating the frequency of the chosen projects in each bundle, within a budget limit of 100,000 euros.

	Low income				
	1ˢᵗ bundle	2ⁿᵈ bundle	3ʳᵈ bundle	4ᵗʰ bundle	5ᵗʰ bundle
1: Lifestyle coaching including PA	0	0	1	1	0
2: Lifestyle coaching without PA	0	0	0	0	1
3: Local sports coach	0	0	0	0	0
4: Fruit and vegetable boxes	3	2	2	1	2
5: Bariatric surgery	0	0	0	0	0
6: Living environment	0	0	0	0	0
7: Courses on healthy lifestyles	0	0	0	0	0
8: Sports vouchers	1	1	1	1	1
Bundle costs (euros)	66,540	58,280	86,300	78,040	78,310
	Higher income				
	1ˢᵗ bundle	2ⁿᵈ bundle	3ʳᵈ bundle	4ᵗʰ bundle	5ᵗʰ bundle
1: Lifestyle coaching including PA	1	1	0	1	0
2: Lifestyle coaching without PA	0	0	0	0	1
3: Local sports coach	0	0	0	0	0
4: Fruit and vegetable boxes	2	1	3	1	2
5: Bariatric surgery	0	0	0	0	0
6: Living environment	0	0	0	0	0
7: Courses on healthy lifestyles	0	0	0	0	0
8: Sports vouchers	1	1	1	1	1
Bundle costs (euros)	86,300	78,040	66,540	94,570	78,310

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Table 9.8 Frequencies of the 24 project motivation codes, displayed for each project, for all respondents together.

Code	Description of the code	Project 1	Project 2	Project 3	Project 4	Project 5	Project 6	Project 7	Project 8
Accessibility	Accessibility of a healthy lifestyle, such as (removing) barriers	3	24	17	20	0	6	4	49
Awareness and learning	Learning and creating awareness about a healthy lifestyle	38	43	7	43	1	4	148	3
PVE budget	The available budget in the PVE	3	9	4	12	1	7	2	3
Coaching	Coaching on living a healthy lifestyle: advice, support, etc.	156	69	57	4	1	7	13	10
Costs and income	Costs of sports and nutrition, income of the participants, etc.	19	20	12	174	5	16	25	148
Do it yourself	Participants have to do it [healthy lifestyle] themselves	4	5	4	2	1	2	5	2
Effects	Effects of the projects: weight loss, self-rated health, etc.	62	49	28	61	44	34	42	47
Emergency solution	Last resort for a healthy weight	0	0	0	1	30	0	0	0
First steps	First step or basis of a healthy lifestyle	12	5	5	31	2	1	17	1
Free choice	Participants have freedom of choice for healthy activities	3	3	2	0	1	0	5	11
Health	Overweight, obesity, mental health, staying healthy, etc.	15	6	2	19	7	30	11	16
Lifestyle	Way of living, becoming more physically active/healthier, etc.	67	64	10	25	1	25	106	17
Living environment	The environment in which people live	1	2	18	1	0	132	1	2
Long term	Sustainability of the effects of health behaviour	30	24	16	13	6	10	19	10
Motivation and stimulation	Motivation, stimulation, discouragement, mindset, etc.	70	35	61	48	6	54	27	72
Nutrition	Diet of participants, healthy and unhealthy products, etc.	24	24	4	356	9	11	45	7
Other/unclear	Vague/unclear motivations	10	6	4	7	6	10	8	2
Personal situation	Respondents argue from their own situation	16	17	4	22	9	10	6	16
Practicality of project	How easy/difficult a project is to conduct	0	0	1	4	1	0	0	0
Project duration	How long a project will last	8	6	0	0	0	4	2	0
Reach	How many people can participate or can be reached	13	14	50	25	5	68	27	31
Social aspect	The social aspect of the project, such as meeting new people	21	7	76	2	0	14	7	10
Sports and PA	Inclusion of sports and PA	158	81	76	11	5	48	18	221
Value judgement	How respondents value the project: healthy, good, etc.	86	44	36	218	20	69	64	80
Total number of codes	Total number of codes per project	819	557	494	1099	161	562	602	758

Qualitative results

The project motivations of 826 respondents were coded; the other 227 respondents did not provide any project motivations. The respondents indicated the *'importance'*, *'helpfulness'* and *'usefulness'* of each project for promoting a healthy weight among participants. Respondents rarely considered the *'practicality of the project'* or *'project duration'*. We discuss the most frequently mentioned project motivation codes for each project (Table 9.8), followed by the most important reasons for not selecting particular projects. We did not observe substantial differences in code occurrence between respondents with low or higher incomes, except for three observations: for all projects, the percentage of respondents providing a value judgement was slightly higher for respondents with a higher income; for projects where *'costs'* were often mentioned (project 4 and 8), the percentage of respondents providing a motivation concerning costs was slightly higher for respondents with a low income (25.4% versus 15.2% respectively 23.7% versus 19.1%); and for project 5, the percentage of respondents indicating something about *'motivation and stimulation'* was higher for respondents with a low income (20.0% versus 2.1%).

Project 1: lifestyle coaching including PA

A myriad of the respondents who selected project 1 stressed the importance of a lifestyle coach to motivate participants to be physically active: *'PA is important at every age. Coaching motivates and probably has better results than independent PA'* (respondent [r.] 529). Some respondents indicated that project 1 seems more effective than project 2 because of the addition of sports. Respondents also stressed that the coach could improve participants' diets and lifestyles in addition to promoting PA: *'This seems helpful to support people in the beginning. A lifestyle coach can also inform about healthy nutrition. This often also results in extra motivation'* (r. 720).

Project 2: lifestyle coaching without PA

Several respondents chose project 2 over project 1 because not all people are able to participate in sports activities: *'Not everyone wants or has time to do sports. That's what this coach is for, to show that one can live healthily without sports (find other ways to do PA)'* (r. 434). The main reasons for choosing this project were guidance by the lifestyle coach to improve participants' lifestyles and the project's impact on weight and self-rated health: *'[This project has] quite a large reach [and results in] highly increased self-rated health and a few kilograms of weight loss'* (r. 672). A few respondents chose this project because they themselves *'hate sports'*. Some respondents indicated that this project could be nicely combined with project 3.

Project 3: local sports coach

Respondents indicated that the most important part of this project is the social aspect: *'Doing sports with your neighbours is convivial. People who know each other better motivate each other'* (r. 227). Besides this mutual participant motivation, the local sports coach also stimulates citizens: *'I think this is a positive way to improve your health. Moreover, it*

brings people together and a coach can make people enthusiastic and motivated' (r. 566). The reach of the project was perceived to be high, since the whole neighbourhood could participate, including children: *'This project reaches many people. It involves the whole neighbourhood and potentially also family members'* (r. 1037).

Project 4: fruit and vegetable boxes

Respondents who selected this project often indicated that fruit and vegetable boxes are *'tasty'*, *'healthy'* or *'good'*. Respondents also perceived fruit and vegetables as expensive, which makes them inaccessible for people with low incomes: *'A healthy choice, because fruits and vegetables are not cheap'* (r. 65). According to respondents, the positive effects of fruit and vegetable boxes are the impact on health, weight and vitamin intake; the fact that the boxes reach households including children; and that fruit and vegetable boxes may motivate participants to continue healthy eating after the project has ended: *'If fruits and vegetables are more accessible (e.g., cheaper), then people are more likely to eat them more often. When people get used to this, they will include them in their diet permanently'* (r. 131).

Project 5: bariatric surgery

Bariatric surgery was seen as an *'emergency solution'* that is highly effective to lose lots of weight quickly: *'This is for many people who have tried everything. Eventually it is the only solution to actually lose weight permanently'* (r. 227). Additionally, respondents indicated that surgeries are sometimes *'necessary'* for obese citizens to lose weight and to be able to become physically active. A few respondents, who had bariatric surgery themselves or knew people who have had this surgery, mentioned the positive impact on weight: *'I learned from people around me that this is the only way to permanently stop being overweight or obese'* (r. 302). Lastly, some respondents chose this project because they themselves would like to get bariatric surgery to lose some weight: *'Seems to be the only solution for me'* (r. 328).

Project 6: living environment

Many respondents stressed the importance and healthiness of improving the living environment, since it influences both mental and physical health: *'A good living environment stimulates people to live healthier. It is also good for mental health (which in turn influences physical health)'* (r. 854). Furthermore, respondents chose this project because it reaches many citizens, not only people with low incomes, and because they believe citizens will engage more in sports and PA when their living environment improves: *'An attractive and safe environment encourages people to go outside and have a walk, or to go cycling instead of taking the car'* (r. 866). Respondents indicated that this is not only the case for adults, but also for children: *'By building playgrounds, basketball courts or football fields, you encourage children and adolescents to be physically active'* (r. 281). Lastly, this project was seen as an investment in the future, since the changes and improvements would last for many years.

Project 7: courses on healthy lifestyles

The most frequently mentioned reason that respondents chose this project was to create awareness, knowledge and insights among participants about healthy lifestyles: *'Many people do not know what a healthy lifestyle entails. Such a course could provide insights'* (r. 929). Suggested topics for such courses were mostly *'lifestyle'* and *'nutrition'*, particularly when combined with project 5, and rarely *'sports and PA'*. Respondents also mentioned the impact of the project on weight, self-rated health and lifestyle in general, but some respondents did not expect a major effect on participants' lifestyles: *'I expect that this will not be very effective because it does not target the most important factor: motivation. How do you get people to participate in courses? Nevertheless, I would schedule one course and evaluate the turn-out'* (r. 108).

Project 8: sports vouchers

Sports, and going to a gym in particular, were perceived to be expensive for people with low incomes: *'A low income makes it hard or impossible to pay for a subscription, to buy clothes, and to pay for membership'* (r. 669). This project makes sports and PA accessible for these citizens: *'Some people see their friends play at a sports club and would like to participate themselves, but do not have enough money. These people do not need motivation; they need financial support like these sports vouchers'* (r. 403). Respondents also stated it is *'healthy'* and *'important'* that everyone gets the opportunity to be physically active, and that sports vouchers could motivate citizens to increase their PA: *'When your income is low, you do not have money left over to spend on sports. This [project] encourages people to exercise more and makes it financially possible'* (r. 164).

Reasons for not choosing projects

The main reasons given for not choosing certain projects were the high costs, limited reach and lack of effectiveness: *'I had to make a trade-off between projects. I chose projects that seemed most effective to me'* (r. 815). Furthermore, the project choices were influenced by the overall PVE budget (100,000 euros) and by personal preferences: *'I thought many projects were important, but with this budget I had to choose, so I chose the two projects that would make me the happiest'* (r. 31). Specifically, project 5 was perceived as risky and insufficient, with a low reach: *'Some projects (like project 5) do not solve the problem; the cause is not addressed'* (r. 37).

Respondents' opinions about the study

Respondents thought it was interesting to participate in the study and liked being part of the study: *"Interesting survey concerning a good and important topic"* (r. 218). They also hoped the results would be used in policymaking and stressed the importance of this: *"I think it is a good project and I hope it will be realised"* (r. 184).

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Discussion

This study aimed to explore citizen preferences regarding the public funding of projects that promote a healthy body weight among people with a low income. The most attractive project was the sports vouchers, while the least attractive projects were bariatric surgery and lifestyle coaching without PA. The optimal combination of projects within the budget constraint contained one round of lifestyle coaching including PA, two rounds of fruit and vegetable boxes, and one round of sports vouchers.

The fruit and vegetable boxes and the sports vouchers were included in all optimal bundles, indicating that these were the most preferred projects, mostly because making a healthy lifestyle cheaper or free was considered to improve its accessibility for people with a low income. The appearance of these two projects in all optimal bundles (i.e., the general optimal bundles and the optimal bundles for respondents with a low and a higher income separately) might imply that these project are in some way *unanimously* preferred, regardless of income. In a study in which health promotion experts unravelled the effective elements of PA initiatives for people with a low socioeconomic status, improving accessibility was identified as an important effective element [11]. Although the projects concerning lifestyle coaching with or without PA appear in three of the five optimal bundles, it is interesting to see that respondents' intrinsic preference for most projects with some form of coaching was relatively low, despite three of the effective elements in a previous study focussing on coaching [11]. This could be explained by the higher project costs per participant. It also appeared from our PVE that respondents valued change in self-rated health more than change in weight. A reason could be the broader definition of self-rated health compared with body weight, but future research is needed to explain this observation.

In previous Willingness-to-Pay (WTP) studies that aimed to identify how much citizens are willing to pay for certain projects with their private money, people with lower incomes had a lower WTP [16, 28]. We therefore explored whether preferences differed between citizens with different incomes. We observed that respondents with a low income were less likely to choose four of the projects than people with a higher income: adaptation of the living environment, lifestyle coaching with and without PA, and the local sports coach. We did not observe differences for the other four projects; however, our results suggest that a difference exists between what citizens with a higher income prefer to be funded for people with a low income, and what citizens with a low income would like to see funded for themselves. Paternalistic altruism, meaning that citizens care about the use of resources regardless of the value of these resources to the users, could explain these results [29, 32]. Citizens with a high income might advise the government to allocate public budget toward funding a lifestyle coach for people with a low income because they think that the coach might positively affect their health, although people with a low income may not want such a coach to interfere in their lives. Future research may be needed to further identify this phenomenon in terms of projects that promote a healthy weight among people with a low income. Moreover, a normative question concerns the extent to which policymakers should weigh the preferences of

people who are affected by the policies (those with a low income) and those who are not affected (higher incomes) in their decisions.

Overall, respondents with a low income tended to spend less of the available budget than respondents with a higher income, which means that they shifted more money to next year. Although we focussed on a public budget from the municipality and a healthcare insurance company in this study, the observed difference aligns with findings from the previous WTP studies [16, 28]. It therefore seems that having a low income not only influences citizens' WTP with private money, but also their willingness to allocate the public budget; however, this contrasts with the results of Pfarr & Schmid (2016), who observed that citizens benefiting from public coverage had a higher WTP [14].

Lastly, we aimed to identify the reasons for citizens' preferences, which for most projects contained a value judgement, such as importance, healthiness or usefulness. Other project motivations were related to project costs and their effects in terms of motivating participants to improve their lifestyle, weight loss and self-rated health. Few meaningful differences were found between respondents with a low income and respondents with a higher income.

This is the first study to explore citizen preferences regarding the public funding of projects that promote a healthy body weight among people with a low income; however, previous studies explored citizen preferences for the spending of public resources regarding healthcare insurance (e.g., social health insurance, and public spending on or public funding of healthcare) using DCE, surveys, and a Citizen Forum [14, 15, 29]. More recently a PVE was used to examine citizen preferences for lockdown measures against the spread of COVID-19 [19]. These studies, including our own, stress the importance and usefulness of citizen participation and opinions in decision-making processes regarding public budgets. Based on our results, it appears that citizens prefer projects that improve the accessibility of healthy lifestyles, such as sports vouchers or fruit and vegetable boxes, over projects that focus on coaching. Such projects are often not limited to the field of public health policy, so policymakers inside and outside the health domain could use these results to guide their decisions on budget distributions to promote a healthy body weight among people with a low income.

Strengths and limitations

To date, PVEs have been used for studies related to infrastructure [17], municipal energy projects [30, 31] and COVID-19 [19]. Our study shows that a PVE appears to be a useful instrument to provide insights into citizen preferences for the health domain as well. We were able to map citizen preferences from a large sample that reflected Dutch society with regard to gender, age and education level. Projects for people with low incomes are often funded by public money, and although public budgets usually consist of taxes and premiums paid for by citizens, these citizens often do not have a say in how these budgets are spent. Therefore, an important strength of our study is that it gives citizens a voice in the allocation of public money. A PVE puts citizens into the shoes of policymakers, making this a more realistic representation of decision making than a

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DCE [18]. Additionally, respondents can compare bundles of projects instead of two single projects at a time, as they would in a DCE. Studies like this one could inform policymakers about the views or opinions of citizens to improve the correlation between citizen preferences and the actual allocation of public budgets to health-promoting projects.

However, our study also has some limitations. First, the generalisability of this study is limited, since it was only conducted in the Netherlands. The results might differ when conducting the study in other countries due to differences in, for example, culture or economic position. Second, respondents could only choose from eight projects. Although we aimed to include a variety of projects, respondents might have preferred projects that were not included in the PVE. Furthermore, our selection of projects was based on the input of health promotion experts. Other projects may have been suggested and included if the brainstorm session included citizens.

Conclusions

We conducted the first PVE to identify citizen preferences for the allocation of a public budget regarding projects that promote a healthy weight among people with a low income. Our results indicate that projects that improve the accessibility of a healthy lifestyle, such as sports vouchers and fruit and vegetable boxes, are most preferred, while bariatric surgery or projects that include coaching were less preferred. Citizens with a low income tended to spend less of the available budget than citizens with a higher income. Policymakers could use this information to align their public health policies with citizens' opinions, and with the needs and desires of the target population, which would improve public support for projects that encourage a healthy weight among people with a low income.

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Chapter 10

General discussion

Introduction

To improve the health of Dutch citizens and to decrease health inequalities between citizens with a low socioeconomic status (SES) and citizens with a higher SES, care–physical activity (care–PA) initiatives have been developed for citizens with a low SES. Although the impact of such initiatives has been studied for the general Dutch population [1, 2], little is known about care–PA initiatives targeting citizens with a low SES. Regular care–PA initiatives are unlikely to meet the needs of people with low SES, since these citizens experience several barriers to living a healthy life, such as a lack of money and social support, illness or disability, and low self-efficacy [3–7]. Therefore, this thesis aimed to contribute knowledge and insights about care–PA initiatives for citizens with a low SES, so that existing and future initiatives can be adapted to better suit these people. We focussed on the impact and effective elements of such initiatives, as well as the experiences of the participants and the public preferences for such initiatives. In our studies, we examined one specific care–PA initiative, called X-Fittt 2.0, and care–PA initiatives for citizens with a low SES in general.

This chapter starts with a summary of the main findings of this thesis. After that, key insights and implications for health promotion policy and practice are presented, followed by a reflection on the conceptual model for community-based health promotion (CBHP), and a methodological reflection on the conducted research. This chapter ends with conclusions and implications for future research.

Summary of the main findings

Table 10.1 presents an overview of the research objectives and the main findings per chapter.

Chapter 4 describes the results of our mixed-methods study into the short- and long-term impact of X-Fittt 2.0 in terms of health, quality of life (QoL) and societal participation. Using questionnaires, body measurements, group discussions and individual interviews, our study provided evidence that the health of the participants significantly improved, mostly in the short term (after 12 weeks). Participants lost weight, their waist circumference and blood pressure decreased and they rated their own health higher compared with at the start of X-Fittt 2.0. In addition, the group discussions and individual interviews showed that participants feel fitter and stronger, have more energy and a higher stamina, experience fewer physical and mental health problems, use less medication and have improved self-esteem. However, some participants indicated, mostly during the group discussions after 12 weeks, that they experience tiredness or injuries. Participants who became less physically active after the first 12 weeks experienced decreases in their stamina, more psychological problems and tiredness and increases in body weight compared with at the end of the intensive first 12 weeks. Participants' lifestyles also seemed to have improved over the course of X-Fittt 2.0. Participants indicated that they have more knowledge on healthy lifestyles, which helped them to be more aware of what a healthy lifestyle entails and to act more on that, for instance by monitoring

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their diet and by smoking less. This also resulted in a changed mindset regarding their lifestyle. As a result, most participants increased PA, be it at a sports centre or outside the sports setting. However, participants also indicated barriers to maintaining PA after the first 12 weeks, such as lack of money, time or discipline, having problems with their physical or mental health or sports centres closed due to the COVID-19 pandemic. Our study also obtained positive trends regarding paid work based on the questionnaires, which was reinforced by the individual interviews, where a few participants indicated that they have started working again or that they have increased the number of working hours per week. Furthermore, participants mentioned that they have more structure in their lives due to X-Fittt 2.0, which resulted in them undertaking more day-to-day and social activities. However, after the first 12 weeks, some participants indicated that it was difficult to combine the sports sessions of X-Fittt 2.0 with their daily activities. In short, X-Fittt 2.0 seems to have improved the health, lifestyle and societal participation of its participants, especially during the first 12 intensive weeks. This implies that being part of a structured health promotion programme with intensive guidance by a lifestyle coach has the ability to improve the health, lifestyle and societal participation of citizens with a low SES. However, continuation of healthy lifestyle behaviour on one's own seems difficult, often due to a lack of resources, which is a problem that future research needs to address.

Chapter 5 describes the results of our study that aimed to evaluate the impact of participation in X-Fittt 2.0 on healthcare utilisation, using a quantitative analysis of healthcare claims data of the participants. Focus was on general practitioner care, pharmaceutical care, hospital care, paramedical care, medical aids and mental health care. Compared with 2 years before participation, we observed an increased mean utilisation intensity (number of healthcare claims) for paramedical care during the 2 years after the start of X-Fittt 2.0. This increase was likely caused by an increased utilisation intensity for physiotherapy. No statistically significant changes were found for the utilisation rate within other types of health care. Although not the focus of our study, we observed that our population with a low SES generally had a higher healthcare utilisation than the general Dutch population regarding general practitioner care, pharmaceutical care and mental health care.

How participants experienced participation in X-Fittt 2.0 has been described in **Chapter 6**. To obtain these insights, group discussions and interviews were held with the participants. It appeared that most participants wanted to improve their health and PA behaviour. Overall, X-Fittt 2.0 was evaluated positively. Most participants enjoyed the PA programme during the first 12 weeks, because it had a gradual build-up in intensity and guidance by a sports coach, although some other participants experienced the PA programme as too exhausting. Participants also appreciated the structure during the first 12 weeks and that it was free of charge to them. However, it was often mentioned that the intensive programme was too short (12 weeks) and that this should be extended to 24 weeks, to make it easier to integrate the healthy behaviours in participants' lifestyles. A major barrier for many participants to continue PA at the same sports centre after the first 12 weeks was a lack of money. Participants were happy with the atmosphere in the

sports centres where X-Fittt 2.0 was implemented, because they could be themselves and because the people in the groups in which the PA programme was provided were people 'like themselves'. In those groups, participants could motivate each other, which made it easier to try their hardest during the sports sessions. However, some participants preferred to exercise alone. The guidance in X-Fittt 2.0 was helpful for developing and maintaining a healthy lifestyle, according to the participants. The guidance by the lifestyle coaches was highly appreciated, because they were committed, which helped to prevent a relapse in unhealthy behaviour after the first 12 weeks. Some participants had expected more guidance after the first 12 weeks. The participants also appreciated the enthusiasm of the sports coaches and their help in preventing injuries. On the other hand, the guidance by the dietitian was experienced as less positive, since participants would have liked more guidance and feedback, more focus on nutrition during X-Fittt 2.0 and clear guidelines for healthy nutrition after the first 12 weeks. These results could be used to improve care–PA initiatives for citizens with a low SES.

Chapter 7 described the results of our case study regarding the effective elements of the care–PA initiative X-Fittt 2.0. Using the concept mapping method with public health practitioners, we identified nine clusters of effective elements. Cluster 1, *'offer proper monitoring'*, represented effective elements that focus on the monitoring of participants, such as when measures should be taken, how and where they should be taken or how to prevent relapse. In cluster 2, *'develop internal multidisciplinary collaboration (within X-Fittt 2.0)'*, the effective elements described which health promotion professionals should be involved and how this collaboration should be designed. In addition, cluster 3, *'develop external intersectoral collaboration (within the municipality)'*, described the collaboration with other local partners, such as the municipality or primary care. Cluster 4, *'offer structure and sufficient guidance throughout X-Fittt 2.0'*, focused on the way in which participants are guided and on the importance of structure during the first 12 weeks of X-Fittt 2.0, but also on the importance of proper aftercare after the first 12 weeks. In cluster 5, *'make well-defined agreements for participation in X-Fittt 2.0'*, the effective elements regarding agreements with the participants are described, such as elements describing the *contract* that needs to be signed by the participants. Cluster 6, *'offer a suitable physical activity programme in the first 12 weeks'*, described the PA portion of X-Fittt 2.0. The effective elements in this cluster focused, for instance, on the structure of the sports sessions, but also on the size of the group during the sports sessions. In cluster 7, *'offer a pleasant and accessible sports environment'*, the importance of an accessible sports environment was stressed, such as social equality or the absence of a macho culture. Cluster 8, *'use sufficient and proper recruitment strategies'*, described effective elements that focus on the recruitment of participants. And finally, cluster 9, *'make sure the preconditions for X-Fittt 2.0 have been established'*, focused on the preconditions with which a programme must comply, such as providing the care–PA initiative at low cost or having a collaboration with the municipality.

In **Chapter 8**, we unravelled the effective elements of care–PA initiatives for citizens with a low SES, based on the experiences of health promotion experts, using the concept mapping method. This resulted in eleven clusters of effective elements. Cluster 1,

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'approach the participants in a positive, stimulating and encouraging way', described that the care–PA initiative should provide fun, warmth and togetherness, with feedback and compliments and the celebration of small successes. In cluster 2, *'anticipate the barriers that participants will experience throughout the care–PA initiative'*, the effective elements focused on barriers such as debts, stress and speaking a different language, as well as physical, social and financial limitations. Cluster 3, *'embed the care–PA initiative in existing local structures to ensure long-term implementation'*, described the importance of ensuring continuation of the care–PA initiative, for instance by using existing structures and activities. Cluster 4, *'customise the care–PA initiative to the target population'*, stressed the importance of the perceptions and needs of the target population related to their living situation, social norms and level of health literacy. Cluster 5, *'encourage social support within the care–PA initiative'*, described how familiar faces, both among other participants and among the coaches, stimulates participation. Cluster 6, *'offer structure and sufficient guidance throughout the care–PA initiative'*, described that personal guidance and communication, as well as the use of role models and peers, is important; also, the initiative should be small scale and informal. Cluster 7, *'use competent and motivated professionals'*, focused more on the professionals that are involved in a care–PA initiative. They should be enthusiastic and suitable for the target population. The importance of accessibility of the care–PA initiative has been stressed in cluster 8, *'make the care–PA initiative accessible for the target population'*. The initiative should be close to the homes of the participants, at a familiar location. It should involve low costs for the participants, and clear and simple language should be used. The group members should be of similar age and fitness level. Cluster 9, *'target multiple health behaviours and awareness, and monitor progression'*, described effective elements regarding the importance of empowerment, self-confidence, personal goals and monitoring of progression. Cluster 10, *'make recruitment and administration easy'*, described that key figures in the community could help with recruiting participants, and that personal contact is important here. Finally, cluster 11, *'develop intersectoral collaboration with a fixed coordinator'*, described that the municipality, primary care and social work should be involved, that it is important to know where to find each other and that there should be one case manager who takes initiative regarding the collaboration.

In the last chapter, **Chapter 9**, we explored citizen preferences regarding the public funding of projects promoting a healthy body weight among people with a low income and whether these preferences differ between people with different incomes. For this study, a participatory value evaluation was used, in which respondents were asked to advise on the implementation of eight different projects during an online choice experiment, with a total resource constraint of 100,000 euros: 1) lifestyle coaching including PA; 2) lifestyle coaching without PA; 3) local sports coach; 4) fruit and vegetable boxes; 5) bariatric surgery; 6) improving the living environment; 7) courses on healthy lifestyles; and 8) sports vouchers. Regardless of weight loss or QoL improvement, the sports vouchers were the most favoured project, while bariatric surgery was the least favoured project. The optimal bundles of projects mostly consisted of fruit and vegetable boxes and sports vouchers, with in some bundles also lifestyle coaching (with or without PA). It turned

out that respondents with a low income less often chose to fund lifestyle coaching (with or without PA), a local sports coach or improving the living environment compared with respondents with a higher income. In the optimal bundles, respondents with a low income more often chose fruit and vegetable boxes and less often chose lifestyle coaching including PA. They also generally spent a smaller proportion of the available 100,000 euros. This chapter also described the reasons why respondents chose particular projects. For project 1, *'lifestyle coaching including PA'*, these related to motivating participants, providing them with PA opportunities and helping them improve their lifestyle. Project 2, *'lifestyle coaching without PA',* was often preferred over project 1, because not all people are able to participate in PA activities. Furthermore, this project could help participants to improve their lifestyle. For project 3, *'local sports coach'*, the social aspect was important (in the neighbourhood), as well as the coach being able to stimulate citizens. Reasons for participants to choose project 4, *'fruit and vegetable boxes'*, were their healthiness and their expected impact on the health of participants, but also the fact that fruits and vegetables were perceived to be expensive. Project 5, *'bariatric surgery'*, was seen as an *emergency solution* that is sometimes *necessary*. For project 6, *'improving the living environment'*, it was often mentioned that it is important and healthy to improve the living environment with regards to mental and physical health. Furthermore, it was perceived to reach many citizens and to improve PA among the citizens. Project 7, *'courses on healthy lifestyles'*, were expected to create awareness and to improve knowledge among the participants regarding lifestyle and nutrition. Finally, for project 8, *'sports vouchers'*, it was mentioned by the respondents that sports are expensive for people with a low income and that this project could improve the accessibility of sports. Reasons for not choosing projects during the experiment were that the costs were too high, that the projects had a limited reach, that they lacked effectiveness or that respondents only had a limited budget (100,000 euros) in the participatory value evaluation. Overall, projects that improve accessibility of healthy lifestyles seem to be most preferred (i.e., sports vouchers and fruit and vegetable boxes), while bariatric surgery or projects that include coaching were less preferred.

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Table 10.1 Summary of the main findings

Chapter	Research questions and main findings
4	**Research question:** What are the short- and long-term outcomes of participation in X-Fittt 2.0 in terms of health, QoL and societal participation? **Main findings:** • Compared with at the start of X-Fittt 2.0, participants lost 2.6 kg of body weight during the first 12 weeks, 3.8 kg of body weight during the first year and 3.4 kg of body weight during the 2-year intervention period. • Compared with at the start of X-Fittt 2.0, participants have a lower BMI (–0.9 kg/m²), waist circumference (–3.8 cm) and blood pressure (–6.3 for systolic, –2.9 for diastolic mmHg), and they rate their own health higher (+0.7 (scale 0–10)) after the first 12 weeks. • Most participants reported that they feel fitter and stronger, have more energy and a higher stamina, experience fewer physical and mental health problems, use less medication and have improved self-esteem compared with at the start of X-Fittt 2.0. • Participants indicated that they have more knowledge on healthy lifestyles and are more aware of a healthy lifestyle, resulting in them improving their lifestyle over the course of X-Fittt 2.0. • Most participants became more physically active inside and outside the sports setting. • A few participants indicated that they have started working again or have increased the number of working hours per week. • Some participants mentioned that they undertake more social and day-to-day activities. • Some participants indicated barriers to maintaining PA after the first 12 weeks: lack of money, time or discipline; having problems with their physical or mental health; or sports centres closed due to the COVID-19 pandemic. • Intensive guidance at the start of the programme stimulated the participants to live more healthily and improved their health in the short term, but continuation of the healthy lifestyle on one's own appeared more difficult for participants with a lack of resources.
5	**Research question:** What is the impact of participation in X-Fittt 2.0 on the healthcare utilisation of citizens with a low SES? **Main findings:** • No changes were observed for general practitioner care, pharmaceutical care, hospital care, medical aids and mental health care. • Compared with 2 years before participation, mean utilisation intensity (number of healthcare claims) increased for paramedical care during the 2 years after the start of X-Fittt 2.0. • Compared with the general Dutch population, our study population appeared to have a higher healthcare utilisation regarding general practitioner care, pharmaceutical care and mental health care.

Chapter	Research questions and main findings
6	**Research question:** What are the experiences of participants in the combined lifestyle intervention X-Fittt 2.0? **Main findings:** • Overall, X-Fittt 2.0 was evaluated positively, with a mean score of 8.3 (scale 1–10). • Participants enjoyed the intensive programme during the first 12 weeks, because it included sports sessions, provided structure and was free of charge. • Participants found the first 12 weeks too short and suggested to extend this to 24 weeks. • Participants mentioned that a lack of money was a major barrier to maintaining PA at the sports centres after the first 12 weeks. • Participants liked the atmosphere in the sports centres and the fact that the people in the groups in which the PA programme was provided were people 'like themselves'. • Participants enjoyed being part of a group, because it helped them to try their best during the sports sessions, since they were motivated and stimulated by the sports coach and by the other participants. • Participants appreciated the guidance by the lifestyle coach, because they helped them to change their behaviour and to maintain a healthy lifestyle. However, some participants had expected more guidance after the first 12 weeks. • Participants would have liked more guidance and feedback by the dietitian, as well as clear guidelines for healthy nutrition after the first 12 weeks.
7	**Research question:** What are the effective elements of X-Fittt 2.0, a care–PA initiative for people with a low SES? **Main findings:** 72 effective elements of X-Fittt 2.0, divided into nine meaningful clusters: • Offer proper monitoring. • Develop internal multidisciplinary collaboration (within X-Fittt 2.0). • Develop external intersectoral collaboration (within the municipality). • Offer structure and sufficient guidance throughout X-Fittt 2.0. • Make well-defined agreements for participation in X-Fittt 2.0. • Offer a suitable physical activity programme in the first 12 weeks. • Offer a pleasant and accessible sports environment. • Use sufficient and proper recruitment strategies. • Make sure the preconditions for X-Fittt 2.0 have been established.
8	**Research question:** What are the effective elements of care–PA initiatives for adults with a low SES in the Netherlands, based on the experiences of health promotion experts? **Main findings:** 113 effective elements of care–PA initiatives for people with a low SES, divided into 11 meaningful clusters: • Approach the participants in a positive, stimulating, and encouraging way. • Anticipate the barriers that participants will experience throughout the care–PA initiative. • Embed the care–PA initiative in existing local structures to ensure long-term implementation. • Customise the care–PA initiative to the target population. • Encourage social support within the care–PA initiative. • Offer structure and sufficient guidance throughout the care–PA initiative. • Use competent and motivated professionals. • Make the care–PA initiative accessible for the target population. • Target multiple health behaviours and awareness, and monitor progression. • Make recruitment and administration easy. • Develop intersectoral collaboration with a fixed coordinator.

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Chapter	Research questions and main findings
9	**Research questions:** • What are citizen preferences regarding the public funding of projects that promote a healthy body weight among people with a low income, and do these preferences differ between people with different incomes? • Why do citizens prefer certain projects that promote a healthy body weight among people with a low income over others? **Main findings:** • Sports vouchers were the most preferred project, while bariatric surgery was the least preferred project. • In the five optimal bundles of projects, fruit and vegetable boxes and sports vouchers appeared in all bundles. In three of the optimal bundles, lifestyle coaching with or without PA were included as well. • Four projects were less likely to be chosen by respondents with a low income than by respondents with a higher income: projects concerning lifestyle coaching with and without PA, the local sports coach and the living environment. • Respondents with a low income more often preferred fruit and vegetable boxes, less often preferred lifestyle coaching including PA and spent less of the available budget of 100,000 euros in the five optimal bundles of projects than respondents with a higher income. • Regarding lifestyle coaching including PA, respondents stressed that the lifestyle coach could motivate participants, provide them with PA and help them improve their lifestyle. • Lifestyle coaching without PA was often seen as the better option for people who are unable to participate in sports activities but want to improve their health. • Regarding the local sports coach, the social aspect was important to the respondents, as well as the coach being able to stimulate citizens. • Regarding the fruit and vegetable boxes, respondents mentioned that fruits and vegetables are expensive, while they are healthy and have an impact on the health of participants. • Respondents perceived bariatric surgery to be an emergency solution that is sometimes necessary. • Improving the living environment was often mentioned as being important and healthy with regards to mental and physical health, and was perceived to reach many citizens and to improve PA. • For courses on healthy lifestyles, respondents expected that they would create awareness and would improve knowledge among the participants regarding lifestyle and nutrition. • The sports vouchers were perceived to be able to improve the accessibility of sports, since respondents mentioned that sports are expensive for people with a low income.

BMI = body mass index; PA = physical activity; QoL = quality of life; SES = socioeconomic status.

Reflection on the findings

The impact of X-Fittt 2.0 compared with other care–PA initiatives

The care–PA initiative X-Fittt 2.0 improved the health, QoL and societal participation of the participants (Chapter 4). If we compare these results with the care–PA initiatives that are currently being covered by the basic healthcare insurance scheme–BeweegKuur, SLIMMER and Samen Sportief in Beweging (SSiB) [1, 2, 8]–we see that the amount of weight loss in X-Fittt 2.0 is higher compared with the other care–PA initiatives at all follow-up measurements (Table 10.2) [1, 2, 8]. This implies that X-Fittt 2.0 is more successful in achieving long-term weight loss than the other care–PA initiatives, even though BeweegKuur and SLIMMER focused on the general population instead of on people with a low SES. However, body mass index (BMI), waist circumference, blood pressure and self-perceived health significantly improved only during the first 12 weeks of X-Fittt 2.0, while the other care–PA initiatives found a positive effect in the longer term as well [1, 2, 8]. It should, however, be noted that study length differed between our study (2 years) and the studies of the other care–PA initiatives (1 year) [1, 2, 8],

which means that it is unknown whether these initiatives were able to maintain these positive results. Furthermore, the decreases in BMI and waist circumference for X-Fittt 2.0 after 12 weeks were (almost) similar to these decreases for SSiB after 1 year [8], which might mean that long-term decreases in BMI and waist circumference could be even bigger for X-Fittt 2.0.

It is, however, difficult to compare different care PA initiatives with each other, as they consist of different components, differ in intensity and measured outcomes at different times. It is notable, though, that the intensity of coaching differed for all care–PA initiatives, with 15 sessions with the lifestyle coach in X-Fittt 2.0, seven sessions of lifestyle coaching in BeweegKuur and no lifestyle coaching in SLIMMER and SSiB [1, 2, 8]. This suggests that more sessions with a lifestyle coach–as is the case in X-Fittt 2.0–does not automatically lead to better results. However, CooL, a lifestyle intervention that offered participants eight group-based lifestyle coaching sessions supplemented with four to 10 individual sessions, resulted in significant improvements in weight over a period of 1.5 years (Table 10.2) [9]. This shows that intensive lifestyle coaching, without providing a PA programme, can have beneficial effects on health as well. Furthermore, BeweegKuur, SLIMMER and SSiB included more (individual and group-based) sessions with a dietitian (five to 11 sessions compared with three sessions in X-Fittt 2.0), which might have contributed to the positive effects of these initiatives [1, 2, 8]. This might mean that increasing the number of dietary consultations in X-Fittt 2.0 could benefit the impact on participants' lifestyles. Thus, a combination of lifestyle coaching and dietary consultations seems to be vital to improve the health and lifestyle of participants of care–PA initiatives.

Furthermore, we found that X-Fittt 2.0 participants increased their daily PA, with more participants exercising regularly. However, we did not measure changes in terms of minutes per week. BeweegKuur, which offered a PA programme similar to that of X-Fittt 2.0, also found improvements in PA behaviour, with participants spending 102 more minutes per week in vigorous PA after 1 year compared with at the start [1]. SLIMMER and SSiB did not measure PA behaviour, although they offered the participants a PA programme. In addition, even though PA was not part of the CooL intervention, its participants spend 88 more minutes per week in vigorous PA after 1.5 years compared with at the start [9]. This may indicate that PA does not necessarily have to be part of the programme to improve PA behaviour, although the results are more favourable when PA is included in the programme.

In summary, although weight loss results seemed to be better compared with BeweegKuur, SLIMMER and SSiB, X-Fittt 2.0 is less effective in improving health and QoL of citizens with a low SES in the long term than the other care–PA initiatives [1, 2, 8]. This could be due to participants of X-Fittt 2.0 being citizens with a low SES, while BeweegKuur and SLIMMER did not focus on one specific socioeconomic group. Additionally, it should be noted that the amount of missing data was high in our study (55%), which might explain the absence of statistically significant results in the long term. We therefore also collected qualitative data, making our study a mixed-methods study [10]. These qualitative data have been important to be able to provide

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better insights into the impact of X-Fittt 2.0, showing that participants experienced a higher stamina, felt fitter and less stressed, reported a higher self-esteem and rated their own health more highly (Chapter 4). In addition, some participants increased participation in work and some mentioned undertaking more social and day-to-day activities. Lastly, awareness of and knowledge on healthy lifestyles increased, resulting in improved lifestyles among the participants. These results are in line with available knowledge on the positive influence of PA on financial, physical, social and emotional capital of individuals [11]. Such qualitative outcomes have, to our knowledge, not been measured for the other care–PA initiatives and proved to be important and valuable for our evaluation of the impact of X-Fittt 2.0. These outcomes enabled us to show that, although the quantitative measures were not statistically significant, X-Fittt 2.0 did have a positive impact on the health, lifestyle, QoL and societal participation of the participants.

Table 10.2 The impact of X-Fittt 2.0, the care–PA initiatives BeweegKuur, SLIMMER and SSiB and the lifestyle intervention CooL on body weight, BMI, waist circumference, blood pressure and self-perceived health.

	X-Fittt 2.0	BeweegKuur [1]	SLIMMER [2]	SSiB[d] [8]	CooL [9]
Weight loss					
• 8–12 weeks	− 2.6[a]	-	-	− 1.3[a]	-
• 8 months – 1 year	− 3.8[a]	− 2.9[b]	− 3.0[a]	− 2.7[a]	− 2.3[b]
• 1.5–2 years	− 3.4[a]	-	− 2.9[a]	-	− 1.8[b]
BMI[c]					
• 8–12 weeks	− 0.9[a]	-	-	− 0.4[a]	-
• 8 months – 1 year	− 1.2	− 1.0[b]	− 1.0[a]	− 1.0[a]	− 0.8[b]
• 1.5–2 years	− 1.1	-	− 1.0[a]	−	− 0.6[b]
Waist circumference					
• 8–12 weeks	− 3.8[a]	-	-	− 2.5[a]	-
• 8 months – 1 year	− 2.6	− 4.3[b]	− 5.3[a]	− 3.5[a]	-
• 1.5–2 years	− 1.0	-	− 4.4[a]	-	-
Systolic blood pressure					
• 8–12 weeks	− 6.3[a]	-	-	-	-
• 8 months – 1 year	− 0.6	− 3.3[b]	− 2.8[a]	-	-
• 1.5–2 years	− 0.8	-	− 1.9[a]	-	-
Diastolic blood pressure					
• 8–12 weeks	− 2.9[a]	-	-	-	-
• 8 months – 1 year	− 2.8	− 2.6[b]	− 4.0[a]	-	-
• 1.5–2 years	− 1.2	-	− 2.6[a]	-	-
Self-perceived health					
• 8–12 weeks	+ 0.7[a]	-	-	+ 0.9	-
• 8 months – 1 year	+ 0.3	-	-	+ 1.3	+ 0.5[b]
• 1.5–2 years	+ 0.4	-	-	-	+ 0.7[b]

[a] ≤ 0.05; [b] ≤ 0.001; [c] BMI = body mass index; [d] SSiB = Samen Sportief in Beweging.

The effective elements of care–PA initiatives for people with a low SES

Two studies unravelled effective elements of care–PA initiatives for citizens with a low SES (Chapters 7 and 8), with one of these focussing specifically on the effective elements of X-Fittt 2.0 (Chapter 7). Although the respondents of these studies differed (i.e., public health practice professionals with a more practice-based view versus health promotion experts with a broader expertise in care–PA initiatives for people with a low SES), these studies show some overlap, which points out the main effective elements of care–PA initiatives for citizens with a low SES: support and guidance; accessibility of care–PA initiatives; local collaborations; programme content; and recruitment.

First, personal support and guidance of the participants by, for example, a lifestyle coach within the care–PA initiative is important, in which the focus lies on changing lifestyles instead of losing weight and emphasising enjoyment and structure, with small goals and honest feedback. Role models or peers, or someone the participants can relate to, could also be used as a coach, since these have been demonstrated to lower barriers for participants to participate in an intervention or to be physically active [12, 13]. Support and guidance is also an important aspect regarding the continuation of healthy behaviour and the prevention of relapse into unhealthy behaviours, for instance by empowering participants and strengthening their self-confidence. In changing participants' lifestyle, health professionals can support them by helping them to reflect on their health behaviours, to identify barriers for healthy behaviour and to obtain strategies to overcome those barriers [14]. With such support, the health literacy and self-confidence of participants can be improved, which in turn can improve health behaviour [14–16].

Second, clusters regarding the accessibility of care–PA initiatives have been created in both studies. Multiple aspects of accessibility were identified, such as the use of clear and simple language, the ability to combine the initiative with daily activities and the provision of a small financial compensation for the participation fee. These aspects were thought to lower the barriers that participants could encounter, such as physical, social or financial limitations: experiencing physical pain, stress and anxiety or having debts. Such barriers have been specified by previous studies as well [3–7]. It was emphasised that programme developers should think from the perspective of the participants when designing a care–PA initiative for citizens with a low SES.

Third, both studies presented multiple clusters with effective elements regarding the collaboration within the care–PA initiative, as well as the collaboration with local partners, such as the municipality, mental health coaches, social service and primary care. The need for such an intersectoral or integral approach to tackle overweight and obesity has been stressed by others [17–19]. Such intersectoral collaborations are vital for the sustainable implementation of care–PA initiatives, instead of project-based care–PA initiatives that stop after a while. To achieve sustainable implementation of care–PA initiatives, there should be enough local capacity to develop an infrastructure that supports health promotion [20]. Such an infrastructure also includes multi-stakeholder partnerships, such as the intersectoral collaborations between local actors, for example

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between primary care, municipalities and sports centres, mentioned in our studies [21]. Furthermore, care–PA initiatives for citizens with a low SES are expected to be most successful when they align with existing local initiatives and build on existing intersectoral collaborations [22]. In addition, our studies emphasised the need to have one initiator who coordinates and keeps active the collaboration. The need for such a role has been indicated before, as well as the importance that this coordinator has short lines of communication with other stakeholders in the field [23].

Fourth, both studies identified clusters regarding programme content, including aspects such as social support, for instance by providing the care–PA initiative in a group. Such a group should not be too small or too big, so that participants can become familiar with each other. Previous studies also showed that social support by other participants and belonging to a group improves lifestyle change and maintenance among participants [13, 16, 24].

Fifth, both studies resulted in one cluster regarding recruitment strategies for the care–PA initiatives. Key figures in the community can be helpful for recruitment, as well as word-of-mouth advertising. Furthermore, the motivation of participants should be checked before they start with the care–PA initiative. Research indeed shows that low willingness to change health behaviour, and thus low motivation, can result in non-participation in the programme [3, 25, 26].

Key insights for health promotion

This thesis obtained insights regarding the characteristics of citizens with a low SES, which can be useful in the design of future care–PA initiatives for this target population. For example, participants can have trouble paying for healthy behaviours such as PA. We also demonstrated that when other aspects in participants' lives need their attention, such as family or financial stress, PA and healthy lifestyles may become less important. Previous research showed that it is difficult to change health behaviours that were developed under the influence of the environment one lives in, such as lack of money [27]. Moreover, people with a low SES experience more stress [28, 29],which has found to result in people being less physically active [30]. An explanation for this could be that high levels of stress decrease behavioural control, which results in less healthy lifestyle choices [31]. In addition, citizens with a low SES may have difficulty motivating themselves to live healthy lives, making support from coaches and other participants important. Furthermore, about one-third of the participants of X-Fittt 2.0 (including the dropouts) were not born in the Netherlands. From the group discussions and interviews, as well as from our conversations with the lifestyle coaches, we know that a large proportion of these participants had difficulties with the Dutch language. Care–PA initiatives should therefore be more inclusive and take into account participants with language problems or low health literacy, for example by providing reading materials in easy-to-read language or in different languages [32–34].

The results of this thesis also provide a comprehensive picture of the important aspects of care–PA initiatives for citizens with a low SES, which can be narrowed down

to three key insights: the importance of support and guidance by professionals; the need for accessible care–PA initiatives and healthy lifestyles; and the value of group-based care–PA initiatives.

The importance of support and guidance by professionals

Support and guidance by coaches seems to play a major role in care–PA initiatives for citizens with a low SES (Chapters 4 and 6 to 9). For instance, guidance by a lifestyle coach was perceived to help participants with changing their lifestyle. The focus of such coaching should lie on improving the lifestyle of participants in the long term instead of on losing weight in the short term. In addition, small goals should be set and progress on these goals should be monitored with the participant, celebrating small successes as a way to motivate participants [32]. In this way, participants' self-efficacy could be increased, leading to the feeling that they are able to achieve lifestyle changes, resulting in participants making a better effort to achieve their goals [14, 35]. For X-Fittt 2.0 specifically, the intensive first 12 weeks, with two sports sessions per week and intensive guidance by the lifestyle coach, were too short for participants. To prevent relapse into unhealthy lifestyles, support by the lifestyle coach should be intensified in the period after the first 12 weeks of X-Fittt 2.0, because it can be hard to keep up the healthy lifestyle after an intervention stops, as has been shown for BeweegKuur [36]. For citizens with a low SES specifically, more intensive PA interventions with more social support by a coach over a longer period of time were found to be more effective than less intensive interventions [37]. It has also been shown that personal (online) support and guidance are important for overcoming set-backs and developing sustainable lifestyle changes that lead to weight loss and maintenance, even during challenging times or life events [13, 38, 39]. Given that life events were also reported as a reason for dropping out of X-Fittt 2.0 (Appendix 4.C), personal support might also play a crucial factor in continuing to participate in care–PA initiatives.

The need for accessible care–PA initiatives and healthy lifestyles

Accessibility of care–PA initiatives and healthy lifestyles appears to be important for citizens with a low SES. Here, the focus lies on four interrelated aspects: costs; pleasant and accessible sports environments; locations close to home; and combinability with daily activities (Chapters 6 to 9).

First, the costs for participation in a care–PA initiative. It has been stressed in this thesis that fruits, vegetables and sports are experienced to be too expensive for citizens with a low SES, which influences their lifestyle choices. Participants of X-Fittt 2.0 liked that the programme was free of charge, including the sports sessions during the first 12 weeks (Chapter 6). Without this compensation of the costs, they would not have been able to participate in X-Fittt 2.0. This was also evident in the period after the first 12 weeks, when participants were forced to stop exercising because they did not have the means to pay for it. Having financial problems or limited financial resources has been associated with lower participation in sports among people with a low SES before [6, 40, 41]. For instance, BeweegKuur participants were unable or unwilling to pay for

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the PA part, since the healthcare insurance company only paid for the health-related portion [36]. Moreover, women of non-Western origin participated in PA programmes at community centres rather than at sports centres, as the latter were experienced as too expensive [13]. Financial incentives, such as cash, vouchers, subsidies or reimbursements, could contribute to improvements in PA behaviour, even after the incentives stop, although effect sizes are small [4, 41–44]. Furthermore, fruits and vegetables are also experienced to be expensive, and making these affordable could increase the intake of fruits and vegetables in low-income households [45–47]. Financial incentives could also improve the fruit and vegetable purchases in such households, although this effect seemed to disappear quickly after the incentive stopped [48]. These results show that the accessibility of PA programmes and fruits and vegetables should be increased by offering them at a low price, making them affordable for citizens with a low income.

Second, the importance of a pleasant and accessible sports environment where participants feel socially safe has been stressed for citizens with a low SES (Chapter 7). An accessible and socially safe sports environment means that there are different kinds of people walking around and that everyone is treated equally. This is an advantage of X-Fittt 2.0, because the atmosphere made participants feel at ease: they had the feeling that they could be themselves and they did not feel ashamed (Chapter 6). Participants did not like other sports centres, because of the *macho culture* and the feeling that they were looked at by other visitors of the sports centre. Previous studies underline that overweight people do not feel at ease in a sports centre with mostly slim and trained people and that people with a low SES prefer to be physically active in an environment that is *stigma free* [13, 25, 41]. These results show that care–PA initiatives for citizens with a low SES should be offered at an open and accessible location that is visited by different types of people, so that everyone can feel at ease.

Third, the location of the care–PA initiative should be close to the homes of participants (Chapters 7 and 8), as this is thought to lower barriers to participate in the initiative [22]. For example, it was expected that *providing a local sports coach* who organises activities in the neighbourhoods of participants makes it easy to participate or that *improving the living environment* makes being physically active more interesting (Chapter 9). Previous research also showed that participants think that programmes being *findable*, such as being provided in the neighbourhood, improves the accessibility [13]. Thus, offering care–PA initiatives in the neighbourhoods, close to participants' homes, could improve the accessibility of these initiatives.

Fourth, participants of care–PA initiatives should be able to easily combine the initiative with their daily activities, to improve accessibility of care–PA initiatives (Chapter 8). For example, participants who dropped out early from X-Fittt 2.0 (Appendix 4.C) often could no longer combine the intensive care–PA initiative (during the first 12 weeks) with their daily activities, such as work or taking care of children and family. Previous studies also found that ensuring that participants can easily combine the initiative with daily activities is important for the accessibility of care–PA initiatives, since *lack of time* is a frequently mentioned reason for non-participation in lifestyle interventions [13, 26, 38, 41].

The value of group-based care–PA initiatives

Besides the support and guidance by a lifestyle coach, being part of a group while participating in a care–PA initiative, with people who suffer from the same kind of health problems, is pleasant, motivating and empowering (Chapters 6 to 8), which has also been demonstrated before [16, 39]. Being surrounded by peers (i.e., people who experience the same barriers and struggles as themselves) can motivate participants, and it also gives them the opportunity to share knowledge and to learn from each other. Studies have shown that group-based interventions were effective for citizens with a low SES, for example because participants can bring each other joy in being physically active [13, 24, 37, 41, 47]. We also found that being part of the group during the first 12 weeks improved the societal participation of participants during that time, resulting in some of them feeling less lonely. Social support could be improved by ensuring that people see familiar faces and by assigning buddies among the group members. Such buddies can also lower barriers of going to a sports centre [12]. The participants of X-Fittt 2.0 would have liked group discussions both during the first 12 weeks and during the aftercare phase, to be able to share experiences and knowledge and to learn from one another (Chapter 6). The benefits of such group sessions have been shown to be important before, for instance for creating behaviour change [13, 36, 49]. Furthermore, such group discussions could be used to evaluate the initiative so that it meets the needs and wishes of the intended participants [22, 34]. Involving family members could also help participants in developing a healthy lifestyle (Chapters 7 and 8), since talking with family about healthy eating makes it easier to eat healthy and being physically active with friends or family is experienced as being more fun than doing it alone [24]. In conclusion, offering care–PA initiatives in a group can stimulate participation and the development of healthy lifestyles.

Implications for policy and practice

This section describes the implications for policy and practice based on the characteristics of citizens with a low SES and the key insights for health promotion that were presented in the previous section. These implications for policy and practice can be seen as guidelines for the (further) development of care–PA initiatives for people with low SES.

Recommendations for policy

Policymakers should now prioritise health-promotion programmes for citizens with a low SES, such as care–PA initiatives, since the health-related goals that have been set for 2040 in the coalition agreement for 2021–2025 of the Dutch government do not show priority on healthy lifestyles [50]. For example, the Dutch basic healthcare insurance scheme currently covers care–PA initiatives only for obese citizens or citizens who are overweight and have an increased risk of developing diabetes type 2 or cardiovascular disease and only after referral by a general practitioner [51]. However, overweight citizens without these increased risks, or even citizens with a healthy weight, might also want to participate in care–PA initiatives to work on their lifestyle, because they wish or

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need guidance in this. These people are now falling between the cracks. It is therefore recommended that policymakers and healthcare insurance companies adjust the criteria for participation in care–PA initiatives, so that everyone can receive the guidance and support they need to live healthy lives. This also means that more lifestyle coaches should be educated to guide participants in care–PA initiatives, as there is currently a shortage of certified lifestyle coaches who are allowed to provide care–PA initiatives [51].

It is also suggested to include the PA portion of care–PA initiatives in the basic healthcare insurance scheme, or to offer the PA portion at an affordable price. The way in which care–PA initiatives are currently funded by the basic healthcare insurance scheme (i.e., the health-related portion of care–PA initiatives being funded by the basic healthcare insurance company, while participants have to pay for the PA portion themselves) makes them inaccessible for citizens with low SES, and therefore this might not be the best way to fund them.

Recommendations for practice
Care–PA initiatives for citizens with a low SES should include a long period of intensive support and guidance, which is needed for participants to develop a healthy lifestyle. Such guidance could be provided by a lifestyle coach, who uses empowerment strategies to improve participants' self-efficacy, since a higher self-efficacy leads to more confidence in being able to integrate and maintain a healthy lifestyle [14–16, 35, 52]. It is also recommended to include a long period of aftercare in which participants have regular meetings with a lifestyle coach to integrate the healthy lifestyle and to help maintaining this lifestyle.

Our studies also show that participants with a low SES can have difficulties regarding maintenance of healthy lifestyles due to barriers they experience in their lives. Knowing such barriers from the participants' point of view and thinking from their perspective is important to make care–PA initiatives accessible for the target population. It is therefore recommended that policymakers and public health practitioners involve citizens with a low SES in the development of care–PA initiatives, to keep in mind the needs, limitations and barriers of these citizens [22, 34, 53]. It is also suggested that practitioners in care–PA initiatives should support participants in overcoming these barriers.

Care–PA initiatives covered by the Dutch basic healthcare insurance scheme and X-Fittt 2.0 are offered in Dutch. Although X-Fittt 2.0 participants spoke the Dutch language, the level at which they did so was often insufficient to understand all the information they received. These participants would have liked to receive information about X-Fittt 2.0 and the diet they had to follow in their own language, such as Turkish or Moroccan. It is thus questionable whether people who speak the Dutch language poorly are sufficiently reached by care–PA initiatives. It is therefore recommended to investigate how these people can be reached with care–PA initiatives, so that they too have the opportunity to work on their health and lifestyle. Moreover, it could be relevant to make learning the Dutch language part of the care–PA initiatives [54].

At the moment, some of the care–PA initiatives that are covered in the Dutch basic healthcare insurance scheme offer individual trajectories as well. This thesis as well as

previous studies, however, showed the importance of group processes in lifestyle changes among citizens with a low SES [13, 24, 37, 41, 47]. It is therefore recommended to offer group-based care–PA initiatives for citizens with a low SES, because it ensures social support among participants and creates opportunities to learn from one another. It is also suggested that these care–PA initiatives be designed in such a way that the participants have the opportunity to talk about their struggles, so that there is togetherness and they can empower and inspire each other.

Results against the background of the theoretical framework for community-based health promotion

In this thesis, the conceptual model for CBHP, developed by Jolley (2014), has been described (Chapter 2) [55]. This framework facilitates both the development of CBHP programmes such as care–PA initiatives and the design of evaluations of care–PA initiatives for citizens with a low SES.

X-Fittt 2.0 has been developed based on evidence from previous research and practical knowledge from public health practitioners [56], which is in line with the model of Jolley, that states that this should be used in the development of CBHP programmes [55]. In addition, Jolley indicates that rapid feedback from new observations obtained in the evaluation phase of CBHP programmes should be used to reshape planning and implementation [55]. Hence, participants and practitioners of the programmes were given the opportunity to provide input for adaptations. In the studies presented in this thesis, we obtained information regarding care–PA initiatives for citizens with a low SES from multiple stakeholders: participants and practitioners of X-Fittt 2.0; health promotion experts; and the Dutch population. This allowed us to include multiple perspectives and has resulted in a broad spectrum of insights concerning care–PA initiatives for citizens with a low SES. Feedback of these insights has been achieved by having researchers share preliminary results with the X-Fittt 2.0 practitioners, for example regarding the impact of X-Fittt 2.0 and the effective elements of care–PA initiatives for citizens with a low SES. These practitioners could then have used these evaluation results to improve X-Fittt 2.0, which to the best of our knowledge has not been done extensively to adapt or improve the care–PA initiative and thus to guide the implementation of X-Fittt 2.0 based on the obtained knowledge. Nevertheless, the programme has been slightly adjusted, for example by intensifying the support by the dietitian, based on our feedback. Future studies should aim to find out how such feedback can be optimised, so that research results can be better used in practice and so that Jolley's framework becomes more useful in the design, implementation and evaluation of care–PA initiatives.

Regarding the design of our evaluation, we have adapted our research (methods) to changes in practice, to ensure that we collected valuable data for the development of care–PA initiatives for citizens with a low SES (Chapter 3). The need for such adaptations has also been stressed by Jolley, who indicated that it is difficult to plan in advance in practice-based research, because the context in which the research is carried out is constantly changing and therefore requires adaptation [55]. External influences,

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such as policy changes, can have consequences for research, as was the case for the studies presented in this thesis. For example, due to policy changes, care–PA initiatives were included in the basic healthcare insurance scheme, which made it relevant to study the influence of participation in such initiatives on participants' healthcare utilisation (Chapters 2 and 5). Adapting research to such changes to obtain new insights is valuable for policy and practice, as has been stated by Jolley [55]. As part of using the CPBH model, we also developed a logical framework as preparation for the studies that have been conducted (Chapter 2, Figure 2.2). Before and during the first 2 years of the project, we have had multiple meetings with municipal stakeholders with the aim to provide feedback to local practice, but due to the adaptations to our research protocol as a result of policy changes, the municipal level of this logical framework has disappeared from the research. However, we have provided valuable insights on the level of the care–PA initiatives and on the level of the citizens. More focus on the municipal level is relevant for follow-up research, for example by obtaining insights in an integrated approach of health promotion for citizens with low SES.

So while the framework of Jolley emphasised the importance of feedback from evaluation to implementation and planning [55], in practice this was not always realistic for our project. As a result, the framework proved especially useful in the design phase prior to our project. During the project, in which we conducted research in and together with practice, adjustments to our research design were made due to changes in policy and practice, which underlines the model of Jolley [55, 57]. Overall, we were able to provide valuable insights for health promotion policy and practice that can be used for the (further) development of care–PA initiatives for citizens with a low SES.

Methodological reflection

Strengths

This thesis adopted a mixed-methods approach to contribute to knowledge about care–PA initiatives for citizens with a low SES, so that existing and future initiatives can better suit people with low SES. To obtain such knowledge, six studies have been conducted, using both quantitative and qualitative research methods. Data collection took place using questionnaires and body measurements (Chapter 4), healthcare claims data (Chapter 5), group discussions and semi-structured interviews (Chapters 4 and 6), concept mapping (Chapters 7 and 8) and participatory value evaluation (Chapter 9). This thesis is characterised by several strengths that concern the mixed-methods approach; the uniqueness of longitudinally evaluating a lifestyle intervention for people with a low SES that included PA on multiple health outcomes; the adaptation of the research to the real-world context; and the use of novel methods in health promotion.

First, the mixed-methods approach of this thesis has been valuable for obtaining insights about care–PA initiatives for citizens with a low SES. By doing so, we were able to answer a broad spectrum of research questions, which we would not have been able to do when using only quantitative of only qualitative research methods [10]. For instance, the use of group discussions and interviews has given us a broader picture of the impact

of X-Fittt 2.0 on the health and lifestyle of participations, which quantitative data alone could not have done [58]. We also used mixed-methods research in the concept mapping studies, where the group discussions in the final step ensured that the results of these studies represented the ideas of the respondents.

Second, we were able to longitudinally evaluate a care–PA initiative for people with a low SES that included a PA component. Although previous studies have evaluated care–PA initiatives [1, 2], our study was the first to evaluate a care–PA initiative that has specifically been developed for citizens with a low SES. Furthermore, we were able to collect data over a period of 2 years, which is longer than previous studies that evaluated care–PA initiatives [1, 2]. In this way, we gained insights into the long-term impact of the care–PA initiative X-Fittt 2.0 on the health of participants. In addition, it gave us insights into the healthcare utilisation of citizens with a low SES compared with the general Dutch population.

Third, we adapted our research to the real-world context. At certain points along this project, the original study protocol no longer fitted the real-life context in which this study has been conducted, which often occurs in research in and together with practice [55]. Policy changes have taken place, such as the inclusion of care–PA initiatives in the Dutch basic healthcare insurance scheme. This seemed to be an interesting opportunity for our project, but the implementation of care–PA initiatives in the Netherlands was going slower than expected and also resulted in X-Fittt 2.0 not being implemented in other municipalities. This complicated data collection. However, we were able to extend the period of data collection from 1 to 2 years, which provided us with long-term insights on the impact of X-Fittt 2.0. Furthermore, because care–PA initiatives were included in the basic healthcare insurance scheme, we considered it relevant to examine the impact of X-Fittt 2.0 on the healthcare utilisation of participants. By doing this, we were the first to study the healthcare claims data of participants of a care–PA initiative. In addition, with the inclusion of care–PA initiatives in the basic healthcare insurance scheme, it became relevant to study whether the Dutch population supported this policy change and which kind of health-promoting projects they would like to see funded to improve the health of citizens with a low SES.

Fourth, we used novel research methods. For instance, concept mapping had rarely been used in the health promotion setting, which made our studies regarding the effective elements of care–PA initiatives for citizens with a low SES unique and innovative. Furthermore, we were the first to use the participatory value evaluation in the field of health promotion. Our study shows that this is an interesting tool to identify the public support of projects that concern health promotion.

Limitations

We believe that in order to answer our research question(s), we have applied the best methods and used the best available data. However, there will always remain methodological shortcomings, and these should be mentioned as well. Limitations concern the observational character of our studies; the small study population and missing control group in our study regarding the impact of X-Fittt 2.0 on healthcare

utilisation; the absence of citizens with a low SES in our studies regarding the effective elements of care–PA initiatives; and the absence of insights regarding dietary change due to X-Fittt 2.0.

First, the observational character of our studies regarding the impact of X-Fittt 2.0 in a real-life setting (Chapters 4 and 5). These studies have been conducted in practice, where we evaluated an already existing intervention, instead of using an experimental approach. A control group could not be included in our studies, since the real-life setting prevented us from being able to select an adequate control group [59]. Controls would have to meet certain criteria, such as being overweight or obese and having an income at or below the minimum wage level and receiving municipal benefits, but such information is not publicly available, making it impossible to select an adequate control group. To counterbalance the missing control group, we used repeated measures that were compared with baseline measures, aiming to evaluate impact over time. In addition, by adopting an observational design in the real-life context, our studies were also more prone to missing data compared with an experimental approach. This led to a high amount of missing data (55%) in our quantitative measures in Chapter 4, which we dealt with as much as possible using a type of analysis that handles missing data relatively well [60]. To compensate as much as possible for the described weaknesses, the mixed-methods design of our study resulted in triangulation, since we have used body measurements, self-reported measurements, healthcare claims data and qualitative data from group discussions and interviews to obtain a complete and credible overview of the impact of X-Fittt 2.0 [61].

Second, our study regarding the impact of X-Fittt 2.0 on healthcare utilisation suffered from a small study sample and missing control group. Only two groups of participants of X-Fittt 2.0 could be included, due to delays in the registration of healthcare claims data. In addition, also for this study it was impossible to select a matching control group. We counterbalanced these issues by choosing a before–after design in this study, where participants served as their own control [62].

Third, we were only able to include one citizen with a low SES in our studies regarding the effective elements of X-Fittt 2.0 and care–PA initiatives in general (Chapters 7 and 8). In the study regarding X-Fittt 2.0, we aimed for more participants to be included, but only one agreed to participate. However, perspectives from citizens with a low SES on care–PA initiatives designed for them would probably have been of added value, since they know best what works for them and could have provided insights valuable for policy and practice. This assumption is strengthened by the different voice of respondents with a low SES in our participatory value evaluation compared with the other respondents in that study. Nevertheless, we tried to obtain knowledge on the needs of citizens with a low SES regarding care–PA initiatives by evaluating the experiences of participants with X-Fittt 2.0 (Chapter 6). These results are valuable for policy and practice as well.

Fourth, we did not measure nutritional behaviour in our study regarding the impact of X-Fittt 2.0. Therefore, we have little information on whether X-Fittt 2.0 was able to change the diet of the participants. Some participants indicated in the group discussions that their diet had improved, while others indicated that they had not changed anything.

Although X-Fittt 2.0 and the other care–PA initiatives all aimed to change nutritional behaviour as well, only SLIMMER actually measured dietary change in their evaluation [1, 2, 8].

Conclusions and implications for future research

This thesis has extended the understanding of care–PA initiatives for citizens with a low SES. Participation in X-Fittt 2.0 improved the health of participants on the short term (i.e., after 12 weeks) on multiple aspects, such as body weight, waist circumference and blood pressure, as well as participants' QoL and societal participation. However, except for body weight, we could not provide evidence for improvements in health and QoL in the long term (i.e., 1 to 2 years after the start). Societal participation seemed to have improved over the long term as well, as some participants started to work (more) or undertake more (social) activities. Contrary to what we expected, we did not find a decrease in healthcare utilisation, while healthcare utilisation for paramedical care (i.e., physiotherapy) increased.

Overall, the results of this thesis yielded three key insights for health promotion that highlight important aspects of care–PA initiatives for citizens with a low SES. First, support and guidance by professionals appears to play an important role in internalising and maintaining new health behaviour, in motivating participants and in overcoming barriers to having a healthy lifestyle, such as being physically active. Second, highly accessible initiatives are needed that address different barriers experienced by citizens with low SES. For example, an initiative that is offered at low cost, in a location close to the participants' homes where participants feel comfortable, and that participants can easily combine with their daily activities. Third, offering the initiative in a group also seems valuable for motivation and support and for sharing knowledge and experiences, which might help in improving participants' lifestyles.

Implications for policy include: prioritising health-promotion programmes for citizens with a low SES, such as care–PA initiatives; adjusting criteria for participation in care–PA initiatives; educating more lifestyle coaches to guide participants; and including the PA portion of care–PA initiatives in the basic healthcare insurance scheme or offering the PA portion at an affordable price.

Regarding practice, implications include: providing a long and intensive period of support and guidance in care–PA initiatives, followed by a long period of aftercare; involving citizens with a low SES in the development of care–PA initiatives; practitioners supporting participants in overcoming barriers that prevent them from living healthily; investigating how people who speak the Dutch language poorly can be reached with care–PA initiatives; and providing group-based care–PA initiatives for citizens with a low SES.

A recommendation for future research is to include a larger study population and, regarding healthcare utilisation, a longer study period as well, to study the effectiveness of care–PA initiatives for citizens with a low SES. Furthermore, the increase in physiotherapy utilisation and the drop-out reasons that were provided by participants

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(Appendix 4.C) suggest that, when this group of participants (i.e., overweight and obese citizens with a low SES) starts to exercise after a long period of physical inactivity, this could easily lead to injuries. Little research is available regarding the risk of injuries among overweight and obese people, but a few studies showed that a higher BMI was associated with an earlier onset of musculoskeletal injuries compared with a lower BMI [63–65]. It is therefore recommended to study whether overweight and obese citizens with low SES who start a care–PA initiative after a long period of physical inactivity are more at risk of developing PA-related injuries, so that adaptations to the PA portion can be made if necessary. In addition, it is also recommended to obtain information in future research on dietary change among citizens with a low SES as a result of participation in care–PA initiatives, since such knowledge is currently lacking.

Overall, we need to *care to move* citizens with a low SES to a healthier lifestyle. This means that we need governments that care about the health of their citizens and that they move towards policies that encourage healthy behaviour. As a result of such policies, the healthcare and PA sector can move towards investing in an integral approach to health promotion to encourage PA and healthier lifestyles among citizens with a low SES. The government and practitioners should acknowledge and focus on the barriers that limit citizens with a low SES from making the move to a healthier lifestyle. And then, if accessible care–PA initiatives exist, people with low SES can *care to move*.

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Summary

Introduction

The overweight and obesity rates of today are unfavourable, have increased over the past years and are expected to further increase in the future. Reasons for this could be the high percentage of physically inactive citizens and the low percentage of Dutch citizens that meet the guidelines regarding the intake of fruits and vegetables, since physical activity (PA) and healthy nutrition are known to protect against overweight, obesity and chronic diseases. In addition, overweight and obesity, physical inactivity and unhealthy diets appear more among citizens with a low socioeconomic status (SES) compared with citizens with a higher SES, leading to health inequalities. Therefore, care–PA initiatives have been developed. In these initiatives, the healthcare sector and the PA sector collaborate to improve the health and lifestyle of citizens and to reduce the risk of developing overweight, obesity and chronic diseases by increasing daily PA and improving dietary behaviours. However, much is still unknown regarding the effectiveness and funding of care–PA initiatives for citizens with a low SES. People with a low SES experience, for instance, different barriers to being physically active and having healthy lifestyles–such as lack of money, stress or low self-efficacy–than people with a higher SES. Therefore, X-Fittt 2.0 has been developed, which is being studied in this thesis.

X-Fittt 2.0 is a 2-year programme consisting of two phases: a 12-week intensive programme and a 21-month aftercare phase. During the first 12 weeks, participants receive intensive guidance in developing a healthy lifestyle (i.e., improved PA levels and diet), which consists of four parts: per week two sports sessions in a group with guidance by a sports coach and one individual sports session; dietary advice and monitoring by a dietitian; coaching by a lifestyle coach to work on personal goals; and two appointments with a physiotherapist to gain insights into body measurements and fitness. The remaining 21 months comprise the aftercare phase, during which participants receive coaching by a lifestyle coach to work on their personal goals and to encourage behavioural maintenance regarding a healthy lifestyle.

Aim

The aim of this thesis is to contribute knowledge and insights about care–PA initiatives for citizens with a low SES, so that existing and future initiatives can better suit this group. In the light of this aim, seven research questions were addressed:

1. What are the short- and long-term outcomes of participation in X-Fittt 2.0, in terms of health, quality of life (QoL) and societal participation?
2. What is the impact of participation in X-Fittt 2.0 on the healthcare utilisation of citizens with a low SES?
3. What are the experiences of the participants in the combined lifestyle intervention X-Fittt 2.0?

4. What are the effective elements of X-Fittt 2.0, a combined lifestyle intervention for people with low SES?
5. What are the effective elements of care–PA initiatives for adults with a low SES in the Netherlands, based on the experiences of health promotion experts?
6. What are citizens' preferences regarding the public funding of projects that promote a healthy body weight among people with a low income, and do these preferences differ between people with different incomes?
7. Why do citizens prefer certain projects that promote a healthy body weight among people with a low income over others?

Methods

This study adopted a mixed-methods approach to obtain a complete picture of care–PA initiatives for citizens with low SES. To study the short- and long-term impact of X-Fittt 2.0 on health, quality of life (QoL) and societal participation, data from 208 participants were collected using questionnaires and body measurements, 17 group discussions (n=71) and 68 semi-structured interviews over a 2-year period. In addition, to study the impact of X-Fittt 2.0 on healthcare utilisation, healthcare claims data of 44 X-Fittt 2.0 participants were used, comparing the 2 years before the start of X-Fittt 2.0 with the 2 years after the start. The 17 group discussions (n=71) and 68 semi-structured interviews with participants were also used to evaluate the experiences of participants with X-Fittt 2.0. To unravel the effective elements of X-Fittt 2.0 and care–PA initiatives for citizens with a low SES in general, two concept mapping studies were conducted, using nine public health practice professionals and one participant, and 19 health promotion experts. Additionally, to explore citizen preferences regarding the public funding of projects promoting a healthy body weight among people with a low income, to identify whether such preferences differ between citizens with a low income and those with a higher income and to identify the reasons underlying these preferences, a participatory value evaluation among 1,053 Dutch citizens was used.

Results

In **chapter 4**, the short- and long-term impact of X-Fittt 2.0 in terms of health, QoL, and societal participation has been evaluated using mixed methods. During the first 12 weeks of X-Fittt 2.0, body weight, waist circumference and blood pressure significantly decreased, while self-perceived health increased. During the remaining 21 months, only body weight significantly decreased. Most participants felt fitter and stronger, had more energy and a higher stamina, experienced fewer physical and mental health problems, used less medication and had improved self-esteem after the first 12 weeks, while some others felt tired or had developed injuries. During the period after the first 12 weeks, participants who became less physically active experienced decreases in their stamina, more psychological problems and tiredness and increases in body weight compared with at the end of the intensive first 12 weeks. Reasons for decreases in PA were experienced

barriers, such as lack of money, time or discipline, having physical or mental health problems, or sports centres closed due to the COVID-19 pandemic. The majority of the participants, however, were more aware of what a healthy lifestyle entails and had improved their lifestyle, for instance by increasing their PA. We also observed positive trends regarding paid work, with a few participants who had started working again or had increased the number of working hours per week. In addition, X-Fittt 2.0 resulted in more structure in participants' daily life, which led to them undertaking more day-to-day and social activities. Thus, X-Fittt 2.0 seems to have improved the health, lifestyle and societal participation of the participants, especially during the first 12 intensive weeks.

Chapter 5 describes the impact of participation in X-Fittt 2.0 on healthcare utilisation, focusing on general practitioner care, pharmaceutical care, hospital care, paramedical care, medical aids and mental healthcare. Mean utilisation intensity (number of healthcare claims) increased for paramedical care in the 2 years before the start of X-Fittt 2.0 compared with 2 years after the start, likely due to an increased utilisation intensity for physiotherapy. No changes were found for the other types of healthcare. Although not the focus of this study, we observed that the studied population with a low SES generally had a higher healthcare utilisation than the general Dutch population regarding general practitioner care, pharmaceutical care and mental healthcare.

In **chapter 6**, the experiences of participants with the X-Fittt 2.0 programme were evaluated. Overall, X-Fittt 2.0 was evaluated positively. The PA programme during the first 12 weeks was appreciated because of its gradual build-up in intensity and the guidance by an enthusiastic sports coach, but some participants experienced the PA programme as too exhausting. Participants enjoyed the atmosphere in the sports centres where X-Fittt 2.0 was implemented, because they could be themselves and because the people in the groups in which the PA programme was provided were people 'like themselves', which motivated them. However, some participants preferred to exercise alone. Participants appreciated that the programme was free of charge to them, but a lack of money was a major barrier for many participants to continue PA at the same sports centre after the first 12 weeks. They also found the intensive programme too short (12 weeks) and should be extended to 24 weeks, to stimulate integration of the healthy behaviours in participants' lifestyles. The guidance by the lifestyle coaches was highly appreciated, because they helped participants to prevent a relapse in unhealthy behaviour after the first 12 weeks. Some participants expected to receive more guidance after the first 12 weeks. The guidance by the dietitian was experienced as less positive, since participants would have liked more guidance and feedback, more focus on nutrition during X-Fittt 2.0 and clear guidelines for healthy nutrition after the first 12 weeks.

Chapter 7 describes the 72 effective elements of X-Fittt 2.0. These effective elements were grouped in nine clusters: 1) offer proper monitoring; 2) develop internal multidisciplinary collaboration (within X-Fittt 2.0); 3) develop external intersectoral collaboration (within the municipality); 4) offer structure and sufficient guidance throughout X-Fittt 2.0; 5) make well-defined agreements for participation in X-Fittt 2.0; 6) offer a suitable physical activity programme in the first 12 weeks; 7) offer a

pleasant and accessible sports environment; 8) use sufficient and proper recruitment strategies; and 9) make sure the preconditions for X-Fittt 2.0 have been established.

In **chapter 8**, the effective elements of care–PA initiatives for citizens with a low SES were unravelled. This resulted in 111 effective elements that were grouped in 11 clusters: 1) approach the participants in a positive, stimulating and encouraging way; 2) anticipate the barriers that participants will experience throughout the care–PA initiative; 3) embed the care–PA initiative in existing local structures to ensure long-term implementation; 4) customize the care–PA initiative to the target population; 5) encourage social support within the care–PA initiative; 6) offer structure and sufficient guidance throughout the care–PA initiative; 7) use competent and motivated professionals; 8) make the care–PA initiative accessible for the target population; 9) target multiple health behaviours and awareness, and monitor progression; 10) make recruitment and administration easy; and 11) develop intersectoral collaboration with a fixed coordinator.

Chapter 9 presents citizen preferences regarding the public funding of projects promoting a healthy body weight among people with a low income and whether these preferences differ between people with different incomes. In a participatory value evaluation, Dutch citizens advised on the implementation on eight different projects, while having a budget constraint of 100,000 euros: 1) lifestyle coaching including PA; 2) lifestyle coaching without PA; 3) local sports coach; 4) fruit and vegetable boxes; 5) bariatric surgery; 6) improving the living environment; 7) courses on healthy lifestyles; and 8) sports vouchers. Sports vouchers were the most favoured project, while bariatric surgery was the least favoured project. The optimal bundles of projects mostly consisted of fruit and vegetable boxes and sports vouchers, with in some bundles also lifestyle coaching (with or without PA). Respondents with a low income less often advised lifestyle coaching (with or without PA), a local sports coach or improving the living environment compared with respondents with a higher income. The optimal bundles of respondents with a low income more often included fruit and vegetable boxes and less often included lifestyle coaching including PA. They also generally spent a smaller proportion of the available 100,000 euros. Overall, fruit and vegetable boxes and sports vouchers were most preferred. Fruits and vegetables and sports were perceived to be expensive, especially for people with a low income, and it was expected that these projects could improve the accessibility of fruits, vegetables and sports. Thus, projects that improved accessibility of healthy lifestyles were most preferred, while bariatric surgery or projects that included coaching were less preferred.

Conclusions and recommendations

This thesis has extended the understanding of care–PA initiatives for citizens with a low SES. This has resulted in three important insights. First, support and guidance from professionals appears to play an important role in learning and maintaining new health behaviours, motivating participants and overcoming barriers to a healthy lifestyle, such as being physically active. Second, highly accessible initiatives are needed that address different barriers experienced by citizens with low SES. For example, an initiative that is

offered at low cost, in a location close to the participants' homes where participants feel comfortable, and that participants can easily combine with their daily activities. Third, offering group-based initiatives also seems valuable for motivation and support and for sharing knowledge and experiences, which might help in improving participants' lifestyles. These insights led to implications for policy, practice and research.

Implications for policy include: prioritising health promotion programmes for citizens with a low SES, such as care–PA initiatives; adjusting criteria for participation in care–PA initiatives; educating more lifestyle coaches to guide participants; and including the PA portion of care–PA initiatives in the basic healthcare insurance scheme or offering the PA portion at an affordable price.

Regarding practice, implications include: providing a long and intensive period of support and guidance in care–PA initiatives, followed by a long period of aftercare; involving citizens with a low SES in the development of care–PA initiatives; involving practitioners to support participants in overcoming barriers that prevent them from living healthily; investigating how people who speak the Dutch language poorly can be reached with care–PA initiatives; and providing group-based care–PA initiatives for citizens with a low SES.

Recommendation for future research are: to include a larger study population and, regarding healthcare utilisation, a longer study period as well, to study the effectiveness of care–PA initiatives for citizens with a low SES; to study whether overweight and obese citizens with low SES who start a care–PA initiative after a long period of physical inactivity are more at risk of developing PA-related injuries; and to obtain information on dietary change among citizens with a low SES as a result of participation in care–PA initiatives.

We need to *care to move* citizens with a low SES to a healthier lifestyle. This means governments that care about the health of citizens; policies that encourage healthy behaviour; healthcare and PA sectors that move towards an integral approach to health promotion; and governments and practitioners that acknowledge the barriers that limit citizens with a low SES to live healthily. And then, if accessible care–PA initiatives exist, people with low SES can *care to move*.

Samenvatting

Introductie

Het percentage mensen met overgewicht en obesitas vormt een bedreiging voor de volksgezondheid. In de afgelopen jaren is dit percentage gestegen en het is de verwachting dat het aantal mensen met overgewicht en obesitas in de toekomst nog verder stijgt. De oorzaak ligt in het grote aantal mensen dat niet genoeg beweegt of te veel en ongezond eet. Overgewicht, obesitas, weinig bewegen en ongezonde voeding komen vaker voor bij mensen met een lage sociaaleconomische status (SES) vergeleken met mensen met een hogere SES. Dit leidt tot gezondheidsverschillen tussen mensen met een lage SES en mensen met een hogere SES. Om de gezondheid en leefstijl van burgers te verbeteren zijn zorg-sportinitiatieven ontwikkeld. In deze initiatieven werken de zorgsector en de beweegsector samen. Het risico op het krijgen van overgewicht, obesitas en chronische ziekten wordt verminderd, doordat deelnemers van zorg-sportinitiatieven worden gestimuleerd om hun dagelijkse beweging te verhogen en hun voedingsgedrag te verbeteren. Er is echter nog veel onbekend over de effectiviteit en optimale financiering van zorg-sportinitiatieven voor mensen met een lage SES. In dit proefschrift worden deze aspecten onderzocht in het kader van X-Fittt 2.0, een zorg-sportinitiatief ontworpen voor mensen met een lage SES.

X-Fittt 2.0 is een tweejarig programma dat bestaat uit twee fasen: een intensief programma van 12 weken en een nazorgfase van 21 maanden. Tijdens de eerste 12 weken krijgen de deelnemers intensieve begeleiding bij het ontwikkelen van een gezonde levensstijl, zoals meer bewegen en gezonder eten. Deze begeleiding bestaat uit vier onderdelen: per week twee sportsessies in een groep met begeleiding door een sportcoach en één individuele sportsessie; voedingsadvies en monitoring door een diëtist; coaching door een leefstijlcoach om te werken aan persoonlijke doelen; en twee afspraken met een fysiotherapeut om inzicht te krijgen in lichaamsmetingen en fitheid. De overige 21 maanden vormen de nazorgfase waarin deelnemers onder begeleiding van een leefstijlcoach aan hun persoonlijke doelen werken en proberen de gezonde leefstijl vol te houden.

Doel

Het doel van dit proefschrift is om kennis en inzichten op te doen over zorg-sportinitiatieven voor mensen met een lage SES, zodat bestaande en toekomstige initiatieven beter kunnen aansluiten bij deze groep. Hiervoor hebben we 7 onderzoeksvragen opgesteld:

1. Wat zijn de korte- en langetermijnuitkomsten van deelname aan X-Fittt 2.0 in termen van gezondheid, kwaliteit van leven en maatschappelijke participatie?
2. Wat is de impact van deelname aan X-Fittt 2.0 op het zorggebruik van mensen met een lage SES?
3. Wat zijn de ervaringen van deelnemers aan de gecombineerde leefstijlinterventie X-Fittt 2.0?

4. Wat zijn de werkzame elementen van X-Fittt 2.0, een gecombineerde leefstijlinterventie voor mensen met een lage SES?

5. Wat zijn de werkzame elementen van zorg-sportinitiatieven voor volwassenen met een lage SES in Nederland, gebaseerd op de ervaringen van experts op het gebied van gezondheidsbevordering?

6. Wat zijn de voorkeuren van burgers ten aanzien van de overheidsfinanciering van projecten die een gezond lichaamsgewicht stimuleren bij mensen met een laag inkomen, en verschillen deze voorkeuren tussen mensen met verschillende inkomens?

7. Waarom kiezen burgers bepaalde projecten die een gezond lichaamsgewicht stimuleren bij mensen met een laag inkomen en andere niet?

Methode

In dit proefschrift is gebruik gemaakt van *mixed methods*. Om de korte- en langetermijnuitkomsten van X-Fittt 2.0 op gezondheid, kwaliteit van leven en maatschappelijke participatie te bestuderen werd informatie van 208 deelnemers verzameld. Daarbij is gebruik gemaakt van vragenlijsten en lichaamsmetingen, 17 groepsgesprekken (n=71) en 68 individuele interviews over een periode van 2 jaar. Om de impact van X-Fittt 2.0 op het zorggebruik te achterhalen werden gegevens over zorgclaims van 44 X-Fittt 2.0 deelnemers gebruikt, waarbij het zorggebruik in de 2 jaren voor de start van X-Fittt 2.0 werd vergeleken met de 2 jaren na de start. De 17 groepsgesprekken (n=71) en 68 individuele interviews met deelnemers werden ook gebruikt om de ervaringen van deelnemers met X-Fittt 2.0 te evalueren. Om de werkzame elementen van X-Fittt 2.0 en zorg-sportinitiatieven voor mensen met een lage SES in het algemeen te achterhalen hebben we in twee onderzoeken de methode *concept mapping* gebruikt: één studie met negen professionals en één deelnemer van X-Fittt 2.0; en één studie met 19 experts op het gebied van gezondheidsbevordering. Daarnaast hebben we een participatieve waarde-evaluatie onder 1.053 Nederlandse burgers uitgevoerd. Met deze evaluatie hebben we onderzocht wat de voorkeuren van burgers zijn als het gaat om overheidsfinanciering van projecten die een gezond lichaamsgewicht stimuleren bij mensen met een laag inkomen. Ook hebben we achterhaald of deze voorkeuren verschillen tussen burgers met een laag inkomen en burgers met een hoger inkomen, en wat de redenen zijn voor burgers om bepaalde projecten wel te kiezen en andere projecten niet.

Resultaten

In **hoofdstuk 4** is het effect van X-Fittt 2.0 op gezondheid, kwaliteit van leven en maatschappelijke participatie onderzocht op de korte en lange termijn. Tijdens de eerste 12 weken van X-Fittt 2.0 namen lichaamsgewicht, buikomtrek en bloeddruk van deelnemers significant af en beoordeelden ze hun eigen gezondheid hoger. Tijdens de overige 21 maanden daalde alleen het lichaamsgewicht significant. De meeste deelnemers

voelden zich na de eerste 12 weken fitter en sterker, hadden meer energie en meer uithoudingsvermogen, hadden minder lichamelijke en mentale gezondheidsproblemen, gebruikten minder medicijnen en hadden meer zelfvertrouwen, terwijl sommige anderen zich vermoeid voelden of blessures hadden opgelopen. Deelnemers die na de eerste 12 weken minder gingen bewegen ervaarden in die periode een afname van hun uithoudingsvermogen, meer psychische problemen en vermoeidheid en een toename van hun lichaamsgewicht. Redenen voor minder bewegen waren gebrek aan geld, tijd of discipline, het hebben van lichamelijke of geestelijke gezondheidsproblemen, of sportcentra die gesloten waren vanwege de COVID-19 pandemie. De meerderheid van de deelnemers was zich meer bewust van wat een gezonde levensstijl inhoudt en had hun levensstijl verbeterd, bijvoorbeeld door meer te bewegen. We hebben ook positieve trends gevonden met betrekking tot betaald werk, aangezien een paar deelnemers weer of meer zijn gaan werken. Daarnaast gaf X-Fittt 2.0 meer structuur in het dagelijkse leven van de deelnemers, waardoor ze meer (sociale) activiteiten ondernamen. X-Fittt 2.0 lijkt dus de gezondheid, leefstijl en maatschappelijke participatie van de deelnemers te hebben verbeterd, vooral tijdens de eerste 12 intensieve weken.

Hoofdstuk 5 beschrijft het effect van deelname aan X-Fittt 2.0 op het zorggebruik van deelnemers, waarbij we hebben gekeken naar huisartsenzorg, farmaceutische zorg, ziekenhuiszorg, paramedische zorg, gebruik van hulpmiddelen en geestelijke gezondheidszorg. In de 2 jaar na de start van X-Fittt 2.0 nam het gemiddelde aantal declaraties toe voor paramedische zorg vergeleken met de 2 jaar voor de start, waarschijnlijk door een toename in fysiotherapie. Voor de andere soorten zorg vonden we geen veranderingen. Hoewel het niet de focus van dit onderzoek was, zagen we dat de onderzochte groep deelnemers met een lage SES over het algemeen meer gebruik maakte van huisartsenzorg, farmaceutische zorg en geestelijke gezondheidszorg dan de gemiddelde Nederlandse bevolking.

In **hoofdstuk 6** hebben we de ervaringen van deelnemers met het X-Fittt 2.0 programma onderzocht. Over het algemeen werd X-Fittt 2.0 positief beoordeeld. Deelnemers waardeerden de geleidelijke opbouw in intensiteit en de begeleiding door een enthousiaste sportcoach in het beweegprogramma tijdens de eerste 12 weken, maar sommige deelnemers vonden het beweegprogramma te vermoeiend. Deelnemers vonden de sfeer in de sportcentra waar X-Fittt 2.0 werd uitgevoerd fijn, omdat ze zichzelf konden zijn en omdat de mensen in de beweeggroepen waren 'zoals zijzelf', wat hen motiveerde. Sommige deelnemers sportten liever alleen. Deelnemers vonden het fijn dat het programma gratis was, maar geldgebrek was voor veel deelnemers een belangrijke reden om na de eerste 12 weken niet door te gaan met sporten in de sportschool. Ook vonden ze het intensieve programma te kort (12 weken). Ze gaven aan dat het programma verlengd moet worden tot 24 weken, om het makkelijker te maken gezond gedrag in het dagelijks leven te integreren. De begeleiding door de leefstijlcoaches werd erg gewaardeerd, omdat zij hielpen voorkomen dat de deelnemers na de eerste 12 weken terugvielen in ongezond gedrag. Sommige deelnemers hadden meer begeleiding verwacht na de eerste 12 weken. De begeleiding door de diëtiste werd minder goed ervaren, omdat deelnemers graag meer begeleiding en feedback, meer aandacht voor

voeding tijdens X-Fittt 2.0 en duidelijke richtlijnen voor gezonde voeding na de eerste 12 weken hadden gehad.

Hoofdstuk 7 beschrijft de 72 werkzame elementen van X-Fittt 2.0. Deze werkzame elementen zijn gegroepeerd in negen clusters: 1) bied passende monitoring; 2) zorg voor interne multidisciplinaire samenwerking (binnen X-Fittt 2.0); 3) zorg voor externe intersectorale samenwerking (binnen de gemeente); 4) bied structuur en voldoende begeleiding tijdens X-Fittt 2.0; 5) maak duidelijke afspraken voor deelname aan X-Fittt 2.0; 6) bied een passend en aantrekkelijk beweegaanbod in de eerste 12 weken; 7) bied een aangename en toegankelijke beweegomgeving; 8) gebruik voldoende en passende wervingsstrategieën; en 9) zorg dat de randvoorwaarden voor X-Fittt 2.0 op orde zijn.

In **hoofdstuk 8** zijn de werkzame elementen van zorg-sportinitiatieven voor mensen met een lage SES achterhaald. Dit resulteerde in 111 werkzame elementen die gegroepeerd zijn in 11 clusters: 1) benader de deelnemers op een positieve, stimulerende en bemoedigende manier; 2) anticipeer op de drempels die deelnemers zullen ervaren tijdens het zorg-sportinitiatief; 3) integreer het zorg-sportinitiatief in bestaande lokale structuren om implementatie op lange termijn te garanderen; 4) pas het zorg-sportinitiatief aan op de doelgroep; 5) stimuleer sociale steun binnen het zorg-sportinitiatief; 6) bied structuur en voldoende begeleiding tijdens het zorg-sportinitiatief; 7) gebruik competente en gemotiveerde professionals; 8) maak het zorg-sportinitiatief toegankelijk voor de doelgroep; 9) richt op meerdere gezondheidsgedragingen en bewustwording, en monitor de progressie; 10) maak werving en administratie makkelijk; en 11) ontwikkel intersectorale samenwerking met één vaste coördinator.

Hoofdstuk 9 laat de voorkeuren van burgers zien met betrekking tot de overheidsfinanciering van projecten die een gezond lichaamsgewicht stimuleren bij mensen met een laag inkomen en of deze voorkeuren verschillen tussen mensen met verschillende inkomens. In een participatieve waarde-evaluatie hebben Nederlandse burgers geadviseerd over de uitvoering van acht verschillende projecten, met een budgetbeperking van 100.000 euro: 1) leefstijlcoaching inclusief sport; 2) leefstijlcoaching zonder sport; 3) buurtsportcoach; 4) groente- en fruitboxen; 5) maagverkleining; 6) verbetering van de leefomgeving; 7) cursussen over gezonde leefstijl; en 8) sportkaarten. Sportkaarten waren het meest favoriete project, terwijl maagverkleining het minst favoriete project was. De optimale bundels van projecten bestonden meestal uit groente- en fruitboxen en sportkaarten, met in sommige bundels ook leefstijlcoaching (met of zonder sport). Respondenten met een laag inkomen adviseerden minder vaak leefstijlcoaching (met of zonder sport), een buurtsportcoach of verbetering van de leefomgeving in vergelijking met respondenten met een hoger inkomen. De optimale bundels van respondenten met een laag inkomen bevatten vaker groente- en fruitboxen en minder vaak leefstijlcoaching inclusief sport. Ook gaven zij over het algemeen een kleiner deel van de beschikbare 100.000 euro uit. Over het algemeen hadden groente- en fruitboxen en sportkaarten de grootste voorkeur. Groente, fruit en sport werden als duur ervaren, vooral voor mensen met een laag inkomen, en verwacht werd dat deze projecten de toegankelijkheid van groente, fruit en sport kan verbeteren. Projecten die

de toegankelijkheid van een gezonde leefstijl verbeterden kregen dus de meeste voorkeur, terwijl maagverkleining of projecten die coaching omvatten minder de voorkeur kregen.

Conclusies en aanbevelingen

Dit proefschrift heeft drie belangrijke inzichten gegeven met betrekking tot zorg-sportinitiatieven voor mensen met een lage SES. Ten eerste blijkt ondersteuning en begeleiding door professionals een belangrijke rol te spelen bij het aanleren en volhouden van nieuw gezondheidsgedrag, het motiveren van deelnemers en het overwinnen van drempels voor een gezonde leefstijl. Ten tweede zijn toegankelijke initiatieven nodig die rekening houden met de verschillende drempels die mensen met een lage SES ervaren. Bijvoorbeeld een initiatief dat tegen lage kosten wordt aangeboden, op een locatie dicht bij huis, waar deelnemers zich prettig voelen, en die de deelnemers makkelijk kunnen combineren met hun dagelijkse activiteiten. Ten derde lijkt het in een groep aanbieden van initiatieven waardevol voor motivatie en ondersteuning en voor het delen van kennis en ervaringen, wat kan helpen bij het verbeteren van de leefstijl. Deze inzichten hebben geleid tot aanbevelingen voor beleid, praktijk en onderzoek.

Aanbevelingen voor beleid zijn bijvoorbeeld: geef prioriteit aan programma's zoals zorg-sportinitiatieven, die de gezondheid van mensen met een lage SES bevorderen; pas criteria voor deelname aan zorg-sportinitiatieven aan; leid meer leefstijlcoaches op om deelnemers te begeleiden; en neem het beweegdeel van zorg-sportinitiatieven op in de basisverzekering of bied het beweegdeel aan tegen een betaalbare prijs.

Met betrekking tot de praktijk zijn de aanbevelingen: bied een lange en intensieve periode van ondersteuning en begeleiding in zorg-sportinitiatieven, gevolgd door een lange periode van nazorg; betrek mensen met een lage SES bij de ontwikkeling van zorg-sportinitiatieven; laat professionals deelnemers ondersteunen bij het overwinnen van drempels die hen belemmeren om gezond te leven; onderzoek hoe mensen die de Nederlandse taal slecht spreken bereikt kunnen worden met zorg-sportinitiatieven; en bied zorg-sportinitiatieven voor mensen met een lage SES aan in een groep.

Aanbeveling voor toekomstig onderzoek zijn: gebruik een grotere studiepopulatie en, wat betreft zorggebruik ook een langere studieperiode, om de effectiviteit van zorg-sportinitiatieven voor mensen met een lage SES te onderzoeken; bestudeer of mensen met een lage SES en overgewicht of obesitas die mee gaan doen in een zorg-sportinitiatief na een lange periode van lichamelijke inactiviteit meer risico lopen op het ontwikkelen van sportblessures; en verzamel informatie over veranderingen in voeding door deelname aan zorg-sportinitiatieven bij mensen met een lage SES.

We moeten mensen met een lage SES ondersteunen in bewegen naar een gezondere levensstijl. Dit betekent dat regeringen zich moeten bekommeren om de gezondheid van burgers; dat beleid gezond gedrag moet aanmoedigen; dat zorg- en beweegsectoren toewerken naar een integrale benadering van gezondheidsbevordering; en dat overheid en praktijk de drempels die mensen met een lage SES beperken om gezond te leven erkennen. En als er toegankelijke zorg-sportinitiatieven bestaan, dan kunnen mensen met een lage SES werken aan gezonder leven.

Appendices

Appendix 4.A: Schwarz's Bayesian information criterion, chi-square values and p-values for the basic model, intermediate models and final model

Table A.1 Basic model, intermediate models and final model for body weight

Model	Schwarz's Bayesian Criterion (BIC)	df	Chi-square	p-value
Gender, Time, Age, Height	2751.6	12	–	–
Gender, Time, Age, Height, Education level	2352.6	17	−399.0	<.00001
Gender, Time, Age, Height, Education level, Employment status (8 categories)	1925.6	24	−427.0	<.00001
Gender, Time, Age, Height, Education level, Employment status (2 categories) (final model)	1894.8	18	−30.8	<.00001

Table A.2 Basic model, intermediate models and final model for BMI

Model	Schwarz's Bayesian Criterion (BIC)	df	Chi-square	p-value
Gender, Time, Age, Height	2006.4	12	–	–
Gender, Time, Age, Height, Education level	1726.5	17	−279.9	<.00001
Gender, Time, Age, Height, Education level, Employment status (8 categories)	1463.0	24	−263.5	<.00001
Gender, Time, Age, Height, Education level, Employment status (2 categories) (final model)	1432.1	18	−30.9	<.00001

Table A.3 Basic model, intermediate models and final model for waist circumference

Model	Schwarz's Bayesian Criterion (BIC)	df	Chi-square	p-value
Gender, Time, Age, Height	2620.4	12	–	–
Gender, Time, Age, Height, Education level	2233.6	17	−386.7	<.00001
Gender, Time, Age, Height, Education level, Employment status (8 categories)	1911.2	24	−322.4	<.00001
Gender, Time, Age, Height, Education level, Employment status (2 categories) (final model)	1880.0	18	−31.3	<.00001

Table A.4 Basic model, intermediate models and final model for systolic blood pressure

Model	Schwarz's Bayesian Criterion (BIC)	df	Chi-square	p-value
Gender, Time, Age, Height	3004.9	12	–	–
Gender, Time, Age, Height, Education level	2578.7	17	−426.2	<.00001
Gender, Time, Age, Height, Education level, Employment status (8 categories)	2076.6	24	−502.1	<.00001
Gender, Time, Age, Height, Education level, Employment status (2 categories) (final model)	2050.0	18	−26.6	<.00001

Table A.5 Basic model, intermediate models and final model for diastolic blood pressure

Model	Schwarz's Bayesian Criterion (BIC)	df	Chi-square	p-value
Gender, Time, Age, Height	2717.3	12	–	–
Gender, Time, Age, Height, Education level	2321.4	17	−395.9	<.00001
Gender, Time, Age, Height, Education level, Employment status (8 categories)	1884.1	24	−437.3	<.00001
Gender, Time, Age, Height, Education level, Employment status (2 categories) (final model)	1853.3	18	−30.8	<.00001

Table A.6 Basic model, intermediate models and final model for QoL

Model	Schwarz's Bayesian Criterion (BIC)	df	Chi-square	p-value
Gender, Time, Age, Height	91.4	12	–	–
Gender, Time, Age, Height, Education level	112.4	17	21.1	<.001
Gender, Time, Age, Height, Education level, Employment status (8 categories)	150.8	24	38.3	<.00001
Gender, Time, Age, Height, Education level, Employment status (2 categories) (final model)	124.1	18	−26.7	<.00001

Table A.7 Basic model, intermediate models and final model for self–rated health

Model	Schwarz's Bayesian Criterion (BIC)	df	Chi-square	p-value
Gender, Time, Age, Height	1236.9	12	–	–
Gender, Time, Age, Height, Education level	1170.2	17	−66.7	<.00001
Gender, Time, Age, Height, Education level, Employment status (8 categories)	1070.6	24	−99.6	<.00001
Gender, Time, Age, Height, Education level, Employment status (2 categories) (final model)	1042.8	18	−27.8	<.00001

Appendix 4.B: codes and themes identified throughout the steps of the thematic analysis

Table B.1 Codes and themes for group discussions identified through the steps of the thematic analysis.

Codes step 2	Themes step 3	Themes step 4	Themes step 5
Awareness	Behaviour	Behaviour/Lifestyle	Lifestyle and behaviour
Behaviour change – positive	Behaviour	Behaviour/Lifestyle	Lifestyle and behaviour
Daily activities – negative	Daily life	Daily life	Daily life
Daily activities – neutral	Daily life	Daily life	Daily life
Daily activities – positive	Daily life	Daily life	Daily life
Employment	Daily life	Daily life	Daily life
Effect – negative	Health	Health	Health
Effect – neutral	Health	Health	Health
Effect – positive	Health	Health	Health
Lifestyle	Lifestyle	Behaviour/Lifestyle	Lifestyle and behaviour
Motivation – positive	Behaviour	Behaviour/Lifestyle	Lifestyle and behaviour
Physical activity	Lifestyle	Behaviour/Lifestyle	Lifestyle and behaviour
Sports	Lifestyle	Behaviour/Lifestyle	Lifestyle and behaviour
Structure	Daily life	Deleted, data extracts not relevant	Deleted, data extracts not relevant

Table B.2 Codes and themes for individual interviews identified through the steps of the thematic analysis.

Codes step 2	Themes step 3	Themes step 4	Themes step 5
Awareness	Behaviour	Behaviour/Lifestyle	Lifestyle and behaviour
Behaviour change	Behaviour	Behaviour/Lifestyle	Lifestyle and behaviour
Daily activities	Daily life	Daily life	Daily life
Daily activities – negative	Daily life	Daily life	Daily life
Daily activities – neutral	Daily life	Daily life	Daily life
Daily activities – positive	Daily life	Daily life	Daily life
Effect – negative	Health	Health	Health
Effect – neutral	Health	Health	Health
Effect – positive	Health	Health	Health
Health – mental	Health	Health	Health
Health – physical	Health	Health	Health
Lifestyle	Lifestyle	Behaviour/Lifestyle	Lifestyle and behaviour
Motivation	Behaviour	Behaviour/Lifestyle	Lifestyle and behaviour
Nutrition	Lifestyle	Behaviour/Lifestyle	Lifestyle and behaviour
Physical activity	Lifestyle	Behaviour/Lifestyle	Lifestyle and behaviour
Smoking behaviour	Lifestyle	Behaviour/Lifestyle	Lifestyle and behaviour
Social life – score	Social life	Social life	Social life
Social life – negative	Social life	Social life	Social life
Social life – neutral	Social life	Social life	Social life
Social life – positive	Social life	Social life	Social life
Sports	Lifestyle	Behaviour/Lifestyle	Lifestyle and behaviour
Support	Social life	Social life	Social life

Appendix 4.C: self-reported reasons for dropout of X-Fittt 2.0

Table C.1 Self-reported drop-out reasons of X-Fittt 2.0 participants

Category	Reason	Number of times
Daily activities	Care for children or family	5
	Work	2
	Due to private circumstances and the COVID-19 measures, it causes a lot of stress in the family	2
	Too many other things to pay attention to	2
	I can no longer attend the group exercise sessions	1
	I found it very annoying to have to be present at a certain time, I did not want to do that	1
Free sports	I only want to exercise twice a week, not get lifestyle coaching	2
	Stopped because she does not understand why she has to come and talk all the time. All she wanted was free sports	1
Health	Physical complaints (lack of energy, pain, hernia, use of medication)	6
	Injuries	4
	Medical reasons (hospital treatment or surgery)	2
Language	Is unreachable. Because she speaks the language very poorly, conversations were almost impossible.	1
Life events	Tough life event	2
	My mother in Turkey died, I am going there for 6 weeks	1
	My father died, I have to deal with that before I can work on myself again	1
Motivation	Did not suit participant	2
	Participant does not want any more meetings, does not need any more guidance	2
	I think I am too old to improve my lifestyle anyway	1
	Because of corona we were no longer allowed to exercise in a group, fitness/individual activities did not appeal to him, so he stopped.	1
	Could not motivate herself to participate any more. She also found the group exercise sessions not fun and too heavy	1
	Withdraws from participation	1
Other/unknown	Can no longer be contacted	13
	Switched to CooL after 1 year	3
	Because they got a bill from the dietitian and are angry	2
	Stopped because she wants to follow a new X-Fittt programme. This is already programme 3 or 4	2
	My husband does not want to take part in the group lessons anyway, so he wants me to stop too (culture).	1
	I live with my foster parents and am not allowed much by my dominant foster mother. That is why I find it difficult to change things	1
	I always want to please my friends and cannot choose for myself. If they want to go to McDonald's, I always drive them there and they treat me to a free menu.	1
	Moved	1
	Too much absent in first phase	1
	Unknown	1
Psychological problems	I am going to get psychological counselling for my psychological problems. I cannot take any more.	1
	Psychological complaints or depression	8

Appendix 4.D: estimates of the intercept and fixed effects of the final models

Table D.1 Estimates of the intercept and fixed effects for body weight

Final model	Estimate	Std. Error	p-value
Intercept	-56.010	35.159	0.114
Fixed part			
Gender (male)	-0.057	4.000	0.989
Gender (female)	reference		
Education level 0	-8.158	9.310	0.382
Education level 1	-2.552	9.519	0.789
Education level 2	-8.745	8.421	0.301
Education level 3	-5.412	9.118	0.554
Education level 4	-6.337	10.874	0.561
Education level 5	reference		
Employment status 0	2.065	1.046	0.051
Employment status 1	reference		
Time 1	3.420	1.582	0.035
Time 2	0.778	1.572	0.623
Time 3	-0.415	1.645	0.802
Time 4	reference		
Age at start	-0.402	0.121	0.001
Height	1.022	0.202	0.000

Table D.2 Estimates of the intercept and fixed effects for BMI

Final model	Estimate	Std. Error	p-value
Intercept	50.924	11.573	0.000
Fixed part			
Gender (male)	0.525	1.301	0.687
Gender (female)	reference		
Education level 0	-3.207	3.113	0.305
Education level 1	-0.439	3.174	0.890
Education level 2	-3.548	2.813	0.209
Education level 3	-1.220	3.028	0.688
Education level 4	-2.265	3.649	0.536
Education level 5	reference		
Employment status 0	0.877	0.453	0.055
Employment status 1	reference		
Time 1	1.083	0.646	0.100
Time 2	0.231	0.651	0.724
Time 3	-0.159	0.867	0.855
Time 4	reference		
Age	-0.147	0.040	0.000
Height	-0.058	0.067	0.386

Table D.3 Estimates of the intercept and fixed effects for waist circumference

Final model	Estimate	Std. Error	p-value
Intercept	48.374	28.175	0.089
Fixed part			
Gender (male)	-1.623	3.248	0.618
Gender (female)	reference		
Education level 0	-7.556	7.465	0.313
Education level 1	-2.532	7.645	0.741
Education level 2	-7.459	6.722	0.269
Education level 3	-8.094	7.279	0.268
Education level 4	-2.417	8.795	0.784
Education level 5	reference		
Employment status 0	2.437	1.336	0.070
Employment status 1	reference		
Time 1	1.024	1.798	0.571
Time 2	-2.727	1.849	0.145
Time 3	-1.542	1.973	0.437
Time 4	reference		
Age	-0.131	0.098	0.185
Height	0.429	0.163	0.010

Table D.4 Estimates of the intercept and fixed effects for systolic blood pressure

Final model	Estimate	Std. Error	p-value
Intercept	127.506	30.323	0.000
Fixed part			
Gender (male)	9.837	3.441	0.005
Gender (female)	reference		
Education level 0	2.033	8.154	0.804
Education level 1	3.670	8.304	0.660
Education level 2	7.994	7.209	0.270
Education level 3	7.339	7.842	0.352
Education level 4	-5.744	9.643	0.553
Education level 5	reference		
Employment status 0	-0.244	2.229	0.913
Employment status 1	reference		
Time 1	0.779	2.988	0.795
Time 2	-5.475	3.172	0.089
Time 3	0.206	3.242	0.950
Time 4	reference		
Age	0.263	0.106	0.015
Height	-0.102	0.175	0.563

Table D.5 Estimates of the intercept and fixed effects for diastolic blood pressure

Final model	Estimate	Std. Error	p-value
Intercept	55.944	20.941	0.009
Fixed part			
Gender (male)	1.358	2.372	0.568
Gender (female)	reference		
Education level 0	6.786	5.721	0.238
Education level 1	8.796	5.751	0.130
Education level 2	10.358	5.011	0.042
Education level 3	12.055	5.450	0.029
Education level 4	10.921	6.611	0.101
Education level 5	reference		
Employment status 0	-0.111	1.460	0.940
Employment status 1	reference		
Time 1	1.221	2.101	0.564
Time 2	-1.632	2.124	0.446
Time 3	-1.616	2.190	0.464
Time 4	reference		
Age	-0.052	0.073	0.478
Height	0.117	0.121	0.336

Table D.6 Estimates of the intercept and fixed effects for QoL

Final model	Estimate	Std. Error	p-value
Intercept	1.353	0.500	0.008
Fixed part			
Gender (male)	0.132	0.056	0.020
Gender (female)	reference		
Education level 0	-0.058	0.135	0.668
Education level 1	-0.092	0.137	0.504
Education level 2	0.043	0.121	0.721
Education level 3	-0.033	0.130	0.800
Education level 4	0.039	0.157	0.802
Education level 5	reference		
Employment status 0	-0.083	0.033	0.011
Employment status 1	reference		
Time 1	0.042	0.043	0.334
Time 2	0.015	0.048	0.755
Time 3	0.017	0.045	0.711
Time 4	reference		
Age	0.000	0.002	0.962
Height	-0.004	0.003	0.134

Table D.7 Estimates of the intercept and fixed effects for self-rated health

Final model	Estimate	Std. Error	p-value
Intercept	4.284	2.653	0.109
Fixed part			
Gender (male)	0.008	0.298	0.979
Gender (female)	reference		
Education level 0	-0.612	0.729	0.403
Education level 1	-0.694	0.740	0.350
Education level 2	-0.247	0.651	0.704
Education level 3	-0.414	0.699	0.554
Education level 4	-0.061	0.827	0.941
Education level 5	reference		
Employment status 0	-0.268	0.170	0.117
Employment status 1	reference		
Time 1	-0.381	0.239	0.117
Time 2	0.265	0.244	0.283
Time 3	-0.113	0.254	0.656
Time 4	reference		
Age	0.029	0.009	0.003
Height	0.008	0.015	0.589

Appendix 4.E: societal participation

Table E.1 Frequencies for participants who had a measurement both at t_0 and t_1 (n=57).

	t_0: n (%)	t_1: n (%)
Paid work		
• Not	53 (93.0)	50 (87.7)
• < 17 hours/week	0 (0.0)	1 (1.8)
• ≥17 hours/week	4 (7.0)	6 (10.5)
Voluntary work		
• Not	29 (50.9)	27 (47.4)
• < 17 hours/week	26 (45.6)	27 (47.4)
• ≥17 hours/week	2 (3.5)	3 (5.3)
Education		
• Not	47 (82.5)	51 (89.5)
• < 17 hours/week	9 (15.8)	6 (10.5)
• ≥17 hours/week	1 (1.8)	0 (0.0)
Household chores		
• Not	2 (3.5)	1 (1.8)
• < 17 hours/week	37 (64.9)	39 (68.4)
• ≥17 hours/week	18 (31.6)	17 (29.8)
Sports		
• Not	20 (35.1)	3 (5.3)
• 1x or less per week	7 (12.3)	7 (12.3)
• Few times a week (2–4)	25 (43.9)	37 (64.9)
• 5 times a week or more	5 (8.8)	10 (17.5)
PA		
• Not	6 (10.5)	5 (8.8)
• 1x or less per week	8 (14.0)	5 (8.8)
• Few times a week (2–4)	25 (43.9)	21 (36.8)
• 5 times a week or more	18 (31.6)	26 (45.6)
Receive visitors		
• Not	16 (28.1)	18 (31.6)
• 1x or less per week	24 (42.1)	31 (54.4)
• Few times a week (2–4)	16 (28.1)	8 (14.0)
• 5 times a week or more	1 (1.8)	0 (0.0)
Visit others		
• Not	9 (15.8)	9 (15.8)
• 1x or less per week	24 (42.1)	29 (50.9)
• Few times a week (2–4)	22 (38.6)	17 (29.8)
• 5 times a week or more	2 (3.5)	2 (3.5)

Table E.2 Frequencies for participants who had a measurement both t_0 and t_2 (n=39).

	t_0: n (%)	t_2: n (%)
Paid work		
• Not	34 (87.2)	29 (74.4)
• < 17 hours/week	2 (5.1)	2 (5.1)
• ≥17 hours/week	3 (7.7)	8 (20.5)
Voluntary work		
• Not	23 (59.0)	27 (69.2)
• < 17 hours/week	16 (41.0)	12 (30.8)
• ≥17 hours/week	0 (0.0)	0 (0.0)
Education		
• Not	33 (84.6)	31 (79.5)
• < 17 hours/week	5 (12.8)	7 (17.9)
• ≥17 hours/week	1 (2.6)	1 (2.6)
Household chores		
• Not	1 (2.6)	0 (0.0)
• < 17 hours/week	28 (71.8)	30 (76.9)
• ≥17 hours/week	10 (25.6)	9 (23.1)
Sports		
• Not	16 (41.0)	8 (20.5)
• 1x or less per week	3 (7.7)	11 (28.2)
• Few times a week (2–4)	17 (43.6)	13 (33.3)
• 5 times a week or more	3 (7.7)	7 (17.9)
PA		
• Not	2 (5.1)	4 (10.3)
• 1x or less per week	5 (12.8)	1 (2.6)
• Few times a week (2–4)	17 (43.6)	9 (23.1)
• 5 times a week or more	15 (38.5)	25 (64.1)
Receive visitors		
• Not	10 (25.6)	9 (23.1)
• 1x or less per week	19 (48.7)	25 (64.1)
• Few times a week (2–4)	10 (25.6)	5 (12.8)
• 5 times a week or more	0 (0.0)	0 (0.0)
Visit others		
• Not	5 (12.8)	10 (25.6)
• 1x or less per week	20 (51.3)	19 (48.7)
• Few times a week (2–4)	13 (33.3)	8 (20.5)
• 5 times a week or more	1 (2.6)	2 (5.1)

Table E.3 Frequencies for participants who had a measurement both at t_0 and t_3 (n=15).

	t_0: n (%)	t_3: n (%)
Paid work		
• Not	14 (93.3)	10 (66.7)
• < 17 hours/week	0 (0.0)	2 (13.3)
• ≥17 hours/week	1 (6.7)	3 (20.0)
Voluntary work		
• Not	9 (60.0)	8 (53.3)
• < 17 hours/week	5 (33.3)	5 (33.3)
• ≥17 hours/week	1 (6.7)	2 (13.3)
Education		
• Not	12 (80.0)	13 (86.7)
• < 17 hours/week	3 (20.0)	2 (13.3)
• ≥17 hours/week	0 (0.0)	0 (0.0)
Household chores		
• Not	1 (6.7)	0 (0.0)
• < 17 hours/week	10 (66.7)	10 (66.7)
• ≥17 hours/week	4 (26.7)	5 (33.3)
Sports		
• Not	5 (33.3)	2 (13.3)
• 1x or less per week	2 (13.3)	1 (6.7)
• Few times a week (2–4)	7 (46.7)	7 (46.7)
• 5 times a week or more	1 (6.7)	5 (33.3)
PA		
• Not	0 (0.0)	1 (6.7)
• 1x or less per week	2 (13.3)	3 (20.0)
• Few times a week (2–4)	8 (53.3)	5 (33.3)
• 5 times a week or more	5 (33.3)	6 (40.0)
Receive visitors		
• Not	3 (20.0)	4 (26.7)
• 1x or less per week	8 (53.3)	8 (53.3)
• Few times a week (2–4)	4 (26.7)	2 (13.3)
• 5 times a week or more	0 (0.0)	1 (6.7)
Visit others		
• Not	1 (6.7)	2 (13.3)
• 1x or less per week	8 (53.3)	9 (60.0)
• Few times a week (2–4)	5 (33.3)	2 (13.3)
• 5 times a week or more	1 (6.7)	2 (13.3)

Appendix 4.F: lifestyle behaviour

Table F.1 Frequencies for participants who had a measurement both at t_0 and t_1 (n=55).

	t_0: n (%)	t_1: n (%)
Monitoring PA behaviour		
• No	43 (78.2)	39 (70.9)
• Yes	12 (21.8)	16 (29.1)
Use of medicines		
• No	12 (21.8)	9 (16.4)
• Yes	43 (78.2)	46 (83.6)
Smoking		
• No	33 (60.0)	33 (60.0)
• Yes	22 (40.0)	22 (40.0)
Drinking alcohol (regularly)		
• No	28 (50.9)	33 (60.0)
• Yes	27 (49.1)	22 (40.0)

Table F.2 Frequencies for participants who had a measurement both t_0 and t_2 (n=39).

	t_0: n (%)	t_2: n (%)
Monitoring PA behaviour		
• No	34 (87.2)	24 (61.5)
• Yes	5 (12.8)	15 (38.5)
Use of medicines		
• No	8 (20.5)	8 (20.5)
• Yes	31 (79.5)	31 (79.5)
Smoking		
• No	26 (66.7)	28 (71.8)
• Yes	13 (33.3)	11 (28.2)
Drinking alcohol (regularly)		
• No	23 (59.0)	31 (79.5)
• Yes	16 (41.0)	8 (20.5)

Table F.3 Frequencies for participants who had a measurement both at t_0 and t_3 (n=12).

	t_0: n (%)	t_3: n (%)
Monitoring PA behaviour		
• No	10 (83.3)	3 (25.0)
• Yes	2 (16.7)	9 (75.0)
Use of medicines		
• No	2 (16.7)	2 (16.7)
• Yes	10 (83.3)	10 (83.3)
Smoking		
• No	6 (50.0)	7 (58.3)
• Yes	6 (50.0)	5 (41.7)
Drinking alcohol (regularly)		
• No	5 (41.7)	7 (58.3)
• Yes	7 (58.3)	5 (41.7)

Appendix 6.A: Statements used in the group discussions

1. 'I would advise others to participate in X-Fittt 2.0 as well.'
2. 'I enjoy exercising because I work out in a group.'
3. 'I feel safe when I exercise in this group.'
4. 'The trainer motivates and encourages me to exercise.'
5. 'I am doing more in my daily life since I joined X-Fittt 2.0.'
6. 'I will continue to exercise after X-Fittt 2.0 has ended.'

Appendix 6.B: Frequency of themes in group discussions and interviews

Table B.1 Number of group discussions (G) or individual interviews (I) in which the themes and related topics were discussed.

	G–t1* (17)	I–t2 (n=31)	I–t3 (n=37)
Participants' goals	**8**	**18**	**29**
• Improve health	7	16	27
• Get more exercise	1	8	2
• Escape social isolation	2	1	1
• Free of charge	1	0	0
Accessibility	**7**	**13**	**7**
• Invitation	3	0	0
• Positive atmosphere	6	7	3
• Financial barriers	7	8	5
Group dynamics	**13**	**16**	**12**
• Positive: atmosphere	10	12	2
• Positive: motivation	13	9	11
• Negative	4	2	1
Guidance	**14**	**22**	**20**
• Lifestyle coach: positive	4	17	13
• Lifestyle coach: negative	2	4	1
• Sports coach: positive	13	14	6
• Sports coach: negative	5	1	1
• Dietitian: positive	7	1	0
• Dietitian: negative	8	2	0
• Other: positive	0	0	2
• Other: negative	3	2	0
Programme content	**14**	**25**	**12**
• Programme: positive	10	12	4
• Programme: negative	9	15	9
• Sports sessions: positive	7	10	0
• Sports sessions: negative	6	4	2

* The number of group discussions in which this was mentioned. The number of different people who mentioned this within these group discussions may be higher.

Appendix 7.A: the CS Global MAX cluster solution

Table A.1 Effective elements, clusters, and bridging scores of X-Fittt 2.0 as computed by computer software (Concept Systems), ranked by bridging score.

Effective elements	Bridging*	Adaptations after group meeting
1 Preconditions for X-Fittt 2.0	**0.42**	**Reformulated: make sure the preconditions for X-Fittt 2.0 are established**
11 One format for the programme (using one version)	0.79	Moved to cluster 'offer structure and sufficient guidance throughout X-Fittt 2.0'
63 Intrinsically motivated participants	0.58	Moved to new cluster 'use sufficient and proper recruitment strategies'
21 Low costs	0.56	Reformulated: low costs for participants
27 Success stories of previous participants	0.55	Deleted: not suitable for low SES target population
52 Recruitment: contact by phone with people who want to participate	0.35	Moved to new cluster 'use sufficient and proper recruitment strategies'
67 Lifestyle coach checks whether motivation of participants is sufficient	0.33	Moved to new cluster 'use sufficient and proper recruitment strategies'
68 Sufficient amounts of time, money and effort for good recruitment and selection of participants	0.33	Moved to new cluster 'use sufficient and proper recruitment strategies'
2 Invitation letter	0.31	Moved to new cluster 'use sufficient and proper recruitment strategies'
25 An information meeting (optional)	0.31	Deleted: not suitable for low SES target population (low attendance)
1 Participants sign a contract about paying a fine for non-compliance or when quitting the programme early	0.27	Merged with element 43 into element 91: clear and achievable contract for participants: agreements about consequences of non-compliance and early drop-out
24 Easy to read information leaflet	0.27	Moved to cluster 'offer proper monitoring' (after merging the clusters 'structured monitoring' and 'measurement of progression')
2 Well-defined agreements for participation	**0.25**	**Reformulated: make well-defined agreements for participation in X-Fittt 2.0**
14 Expectation management towards the participants	0.50	None
43 Well-defined and achievable contract for participants: not too strict with potential costs, etc.	0.32	Merged with element 1 into element 91: well-defined and achievable contract for participants: agreements about consequences of non-compliance and early drop-out
48 Contract should also include obligations from the side of the organisation (X-Fittt 2.0)	0.19	None
30 Mandatory requirements for participation	0.12	None
33 Well-defined agreements with participants about non-compliance	0.12	None

Effective elements	Bridging*	Adaptations after group meeting
3 Structured monitoring	**0.62**	**Merged with cluster 'measurement of progression': offer proper monitoring**
35 Intake (acquaintance)	0.79	Merged with element 28 into element 92: first meeting/intake with lifestyle coach, then intakes with physiotherapist and dietitian, to make sure all questions have been answered
83 Start and end measurements to monitor results on physical and psychological level	0.72	None
89 Intake, intermediate measurements, final measurements	0.71	None
50 Start and end meeting with all participants and public health practitioners	0.69	Deleted: not suitable for low SES target population (low attendance)
28 First intake with lifestyle coach, then intakes with physiotherapist and dietitian	0.55	Merged with element 35 into element 92: first meeting/intake with lifestyle coach, then intakes with physiotherapist and dietitian, to make sure all questions have been answered
47 Mapping available sports and physical activity options after the first 12 weeks	0.53	Moved to cluster 'offer structure and sufficient guidance throughout X-Fittt 2.0'
72 Participants set concrete goals	0.50	None
84 Prevent relapse by offering useful tools for after the programme has ended	0.49	Reformulated: prevent relapse by offering useful tools for after the programme has ended that do not only focus on sports
4 Multidisciplinary collaboration	**0.58**	**Reformulated: develop internal multidisciplinary collaboration (within X-Fittt 2.0)**
44 Dietitian	0.96	Deleted: already included in element 6 and 53
75 Contact with lifestyle coach via phone and e-mail	0.73	None
4 All public health practitioners are on the same page	0.64	None
78 Enough communication between public health practitioners involved	0.57	Reformulated: sufficient communication between public health practitioners involved (sports coaches, lifestyle coaches, physiotherapists, dietitians)
49 Physiotherapists	0.55	Deleted: already included in element 6 and 53
7 Guidance from lifestyle coach	0.52	Deleted: already included in element 6 and 53
88 Committed public health practitioners who do a little extra for each other and the participants	0.51	None
65 Preferably one sports coach	0.49	Reformulated: preferably one sports coach. Moved to cluster 'offer a suitable physical activity programme in the first 12 weeks'
53 Multidisciplinary collaboration of physiotherapists, dietitians, sports coaches, lifestyle coaches	0.46	Reformulated: multidisciplinary collaboration of sports coaches, lifestyle coaches, physiotherapists, dietitians
6 Specialised and educated public health practitioners (sports coaches, lifestyle coaches, physiotherapists, dietitians)	0.40	None

Effective elements		Bridging*	Adaptations after group meeting
5	**Clear structure and guidance**	**0.72**	**Reformulated: offer structure and sufficient guidance throughout X-Fittt 2.0**
9	Setting boundaries for participants	0.89	Deleted: too vague, not clear what is meant
76	Fixed period: 12 weeks	0.88	Reformulated: fixed short period of sports sessions: 12 weeks
12	Structure in the first 12 weeks	0.87	Reformulated: structure in the first 12 weeks (sports sessions and appointments with public health practitioners)
80	Confidential advisor	0.71	None
86	Long-term guidance by lifestyle coach (2 years)	0.71	None
77	Lifestyle coaches use motivational interviewing during conversations with participants	0.68	None
22	Working towards independency	0.61	None
17	Individual attention	0.60	None
81	Good follow-up after the first 12 weeks (e.g., continuing sports sessions in the same group)	0.50	None
6	**Integral approach**	**0.57**	**Reformulated: develop external intersectoral collaboration (within the municipality)**
41	Combined lifestyle intervention: approach with sports/physical activity, diet, physical checks by physiotherapist	0.71	Moved to cluster 'make sure the preconditions for X-Fittt 2.0 have been established'
45	Fixed main contact for participants	0.69	None
16	The same information for everyone (e.g., to municipalities and to participants)	0.63	None
38	Consultation between sports centre and X-Fittt 2.0 organisation	0.58	Merged with element 79 into element 93: sufficient communication between all public health practitioners involved, including physical meetings
37	Collaboration with the municipality	0.50	Moved to cluster 'make sure the preconditions for X-Fittt 2.0 have been established'
79	Good communication between all involved parties	0.49	Merged with element 38 into element 93: clear communication between all involved public health practitioners, including physical meetings
42	Useful network (of public health practitioners from primary care and neighbourhood teams) that wants to collaborate and help by recruiting participants	0.38	Reformulated: network (including public health practitioners from primary care and neighbourhood teams) that helps with recruiting participants
7	**Measurement of progression**	**0.77**	**Merged with cluster 'structured monitoring': offer proper monitoring**
3	List to fill out all information from the physical test for left and right	1.00	Moved to cluster 'make sure the preconditions for X-Fittt 2.0 have been established'

Effective elements		Bridging*	Adaptations after group meeting
5	Valid measurements according to protocol	1.00	None
73	Sufficient guidance with diet and on a psychological level	1.00	None
85	Participants discuss their weighing results (weight)	0.93	None
29	Main goal is changing lifestyle and becoming fitter, instead of losing weight and dieting	0.88	None
62	Weekly weighing	0.87	Moved to cluster 'make sure the preconditions for X-Fittr 2.0 have been established'
20	Multiple checks at different times	0.84	None
82	Proper room for intakes with dietitians and physiotherapists	0.82	Moved to cluster 'make sure the preconditions for X-Fittr 2.0 have been established'
40	Diet (checks by dietitian or lifestyle coach)	0.81	None
87	Proper equipment for measurements (scale, measuring tape, skinfold calliper, etc.)	0.80	Moved to cluster 'make sure the preconditions for X-Fittr 2.0 have been established'
54	Separate room for intakes	0.72	Moved to cluster 'make sure the preconditions for X-Fittr 2.0 have been established'
13	Weekly weighing on the same scale	0.71	None
34	Diet with focus on long term perseverance instead of short term goals	0.50	None
55	Varied healthy diet	0.50	None
74	Clear nutritional plan	0.50	None
90	Handing in of nutritional diary every day	0.43	None
8	**Pleasant sports environment**	**0.34**	**Reformulated: offer a pleasant and accessible sports environment**
66	Sports centre with a variety of members	0.60	None
31	Minimum of 2 trainings sessions per week	0.55	None
61	Sports centre is located in the neighbourhood, close to participants' homes	0.54	None
8	Large room with the right equipment for group sports session	0.39	Merged with element 56 into element 94: group sports session in a large, separate room with the right equipment. Moved to cluster 'make sure the preconditions for X-Fittr 2.0 have been established'
15	Easily accessible: everyone is equal	0.39	None
46	Friendly atmosphere in sports centre	0.38	None
70	Group members motivate each other	0.28	None
56	Exercising in separate room during the sports sessions	0.26	Merged with element 56 into element 94: group sports session in a large, separate room with the right equipment. Moved to cluster 'make sure the preconditions for X-Fittr 2.0 have been established'

Effective elements		Bridging*	Adaptations after group meeting
58	Appropriate sports and physical activity options	0.24	Reformulated: appropriate sports and physical activity options. Moved to cluster 'offer a suitable physical activity programme in the first 12 weeks'
10	Social contacts	0.22	Reformulated: broadening social network
19	Making 'having fun' important	0.22	None
59	Safe environment	0.20	Reformulated: socially safe environment
71	No 'macho culture' in sports centre (few body builders and girls in crop tops, etc.)	0.15	None
9	**Sports options**	**0.21**	**Reformulated: offer a suitable physical activity programme in the first 12 weeks**
18	One sports coach and one intern on a group of 12 participants during the sports sessions	0.44	None
32	Sports coach with affinity for the target population	0.42	Merged with element 39 into element 96: experienced sports coach with affinity for the target population
39	Sports coach with experience and proper education	0.42	Merged with element 32 into element 96: experienced sports coach with affinity for the target population
64	Minimum of 8 participants per group (social support from group)	0.25	Merged with element 69 into element 95: minimum of 8 (social support from group) and maximum of 10 (sufficient guidance and attention) participants per group
69	Maximum of 12 participants per group (not too big, enough individual guidance and attention)	0.25	Merged with element 64 into element 95: minimum of 8 (social support from group) and maximum of 10 (sufficient guidance and attention) participants per group
23	Good build-up of sports sessions to prevent injuries	0.20	None
60	Participants can exercise at home when they are not able to come to the sports centre	0.17	Deleted: not suitable for low SES target population (participants will skip group sports sessions)
26	Sports sessions in a group	0.15	None
36	Attention to group processes and atmosphere during the sports sessions	0.01	None
51	Sufficient variation in sports sessions	0.00	None
57	Participants can indicate their maximum load and exercise at their own level	0.00	None

* Bridging scores indicate the level of homogeneity for each cluster (0 = highest homogeneity, 1 = lowest homogeneity). Bridging scores for the individual effective elements indicate whether an element is an 'anchor' or a 'bridging' element, based on their position on the point map [27]. 'Anchor' elements are located on a certain position on the map because they were sorted by many respondents with elements close to it. 'Bridging' elements are located on a certain position on the map because they were sorted with elements on both sides of the map, and therefore are placed in the middle of these elements.

Appendix 8.A: the CS Global MAX cluster solution

Table A.1 Clusters as the output of the analysis using CS Global MAX, reflecting the effective elements of care–PA initiatives for adults with a low SES according to Dutch HPEs before the group discussion, ranked by cluster letter and element number.

Clusters and their constituent effective elements		Importance*	Bridging**
A		**3.32**	**0.16**
1	Involve the municipality regarding policies concerning this particular target group	3.73	
6	Intersectoral collaboration with the active participation of local stakeholders	3.80	
16	Referral from the general practitioner as a reliable expert	2.93	
24	Feedback to healthcare professionals	2.71	
31	Involvement of the care sport connector/combination officer	3.00	
35	General-practice-based nurse specialist as an intermediary	2.40	
43	Integrated programming, in conjunction with, or as part of other activities or projects	3.13	
48	Have collaboration between the relevant parties at the policy level	3.07	
54	Ensure a good collaboration between primary care, the care–PA initiative, and sports and physical activity options	3.53	
59	Ensure that professionals from the healthcare and physical activity sectors know and understand each other, and know where to find each other	3.67	
65	Collaborate with professionals from the social/welfare domain (neighbourhood teams)	3.80	
73	Warm handover from healthcare provider to sports provider	3.93	
85	Link with well-being/social work	3.27	
123	Use the care sport connector to realize the connection with local sport and physical activity	3.47	
B		**3.41**	**0.42**
2	Connect to learning how to read/write or the library	2.00	
4	Connect to existing activities	3.60	
15	Embed the care–PA initiative in the neighbourhood	4.14	
30	No transfer period (for instance, the participant should be able to start in a new physical activity group immediately after their first physical activity program)	3.47	
58	Ensure that continuation of the care–PA initiative is guaranteed and that participants can either move on to regular activities after the first (physical activity) program or continue their current activities	4.20	
64	Embed the care–PA initiative in existing structures	3.87	
88	Combine the care–PA initiative with debt assistance	3.07	
119	Involvement of opinion leaders	3.00	
C		**3.78**	**0.45**
3	Accessible care–PA initiative that fits the target population	4.47	
5	Connect to the context/living environment of the participants	4.80	
9	Be aware of factors for customisation, such as costs and accessibility	3.60	
13	Make a distinction between people with limited mobility and people with exercise disabilities; consider referring the second group to a physiotherapist	2.87	

Clusters and their constituent effective elements		Importance*	Bridging**
14	Take into account barriers specific to people with a low SES (e.g., debts, language skills, stress, and the characteristics of their social and physical environments)	4.47	
29	Take into account the daily worries and living situation of the participant	4.07	
39	'Outreaching' towards the target group	3.60	
46	Take into account and be aware of the participants' social environment and know the problems participants are dealing with	3.87	
55	Give the target group the opportunity to combine the care–PA initiative with daily activities, such as work and school	3.87	
70	Take the neighbourhood's safety into account	3.47	
75	Let the target group influence/feel they have an influence on the design of the activities/care–PA initiatives	3.87	
87	Participants can participate 'just for fun'	2.80	
89	Materials must be pre-tested among the target group	3.33	
94	Make use of buddies	3.20	
95	Take into account the limitations of the target population (physically, socially, financially)	4.20	
107	Materials must match the health skills and degree of literacy of the target group	3.87	
120	Do not label the participants as 'people with a low SES'	4.00	
D		**3.36**	**0.52**
18	Key figures and intermediaries can be used in the recruitment process; word-of-mouth advertising	3.80	
33	Very low threshold: it should be possible to start exercising the day the decision is made to do so (for instance, directly after a care–PA session, plan an exercise session with the care–PA group)	4.00	
72	Familiar location, where participants already come for something else (e.g., school, community centre, general practice)	4.00	
77	Little paperwork	3.20	
82	Reduce physical thresholds	3.67	
86	Small financial compensation, for instance from the municipal fund	2.53	
97	(Financial) reward when participating	2.00	
99	Affordable care–PA initiative	4.07	
105	Make information available on paper	2.40	
109	Low cost but not free of charge	3.40	
111	Necessary basic conditions must be in place (e.g., childcare)	3.43	
116	Recruit using key figures within the community	3.73	
E		**3.87**	**0.36**
7	Use the power of the group	4.07	
8	Culture plays a role in the organisation, recruitment, execution location, and needs when involving non-Dutch participants	4.20	
19	Connect to the perceptions, motives, wishes, and needs of the target group	4.53	
25	Invest in getting to know the target group: what are the bottlenecks preventing them from being physically active, what are their wishes and needs, etc.	4.47	
41	Take into account barriers such as anxiety and pain	3.73	
63	Allow the target group to develop and execute the care–PA initiative	3.13	
80	Respond to the expectations of the target group and ensure they know what to expect	4.07	

Clusters and their constituent effective elements		Importance*	Bridging**
90	Offer the target group (the feeling of) freedom of choice about behaviour, feelings, and thoughts	3.73	
91	Take into account (other) social norms and (lack of) social support	3.93	
100	For physical activities, groups should preferably consist of persons of the same age, gender, and physical fitness	2.67	
102	Take into account (potential) negative previous experiences with physical activity	3.67	
103	Think from the perspective of the participants, not from the perspective of the professional	4.13	
108	Focus on the skills needed to participate	3.47	
113	Take into account the existing social norms regarding physical activity within the target group	3.93	
122	Clear and simple language, suitable for people with low levels of literacy	4.27	
F		**3.83**	**0.36**
10	Enthusiastic coach	4.60	
36	Local exercise coach (someone like themselves)	2.87	
56	Adequate supervisors/coaches for exercise activities in the neighbourhood	4.21	
57	Give honest feedback and sincere compliments	4.27	
62	Use professionals only for coaching and to offer advice and conceptual input	3.00	
71	Invest in training for professionals to strengthen their competencies	3.43	
84	Suitable supervisors/coaches who make people feel comfortable and to whom people can relate	4.40	
G		**3.91**	**0.25**
28	Intensive guidance	3.13	
37	Positive instead of patronizing approach	4.27	
42	Explain the link for participants between physical activities and the objective: brisk walking → becoming fitter, exercises → becoming stronger, etc.	2.93	
51	Increase awareness of fitness/physical condition	3.53	
53	Stimulate the target group in a positive way	4.33	
60	Emphasize enjoyment and relaxation	3.80	
67	The care–PA initiative must focus on concrete activities and less on knowledge transfer	4.00	
68	Confirm and strengthen self-confidence	4.20	
69	Very practical, small steps; short assignments	4.07	
74	Lots of personal guidance and verbal communication	4.27	
101	Relationship of trust	4.13	
112	Empower participants' self-efficacy	4.07	
117	Make progress visible using simple tests/measurements	3.50	
124	Experience of success: give participants the idea that they are progressing; celebrate small successes	4.53	
H		**3.92**	**0.28**
11	Implementation by peers	3.00	
12	Informal	3.47	
21	Personal goals	3.73	
26	Customised coaching	4.00	
32	The care–PA initiative must focus on small achievable (behavioural) goals	4.07	
34	Focus on social benefits (involve family members, use small groups)	3.60	

Clusters and their constituent effective elements		Importance*	Bridging**
44	Respond to and protect against potential barriers that people will encounter	3.87	
76	Empower the target group to be able to exhibit/execute desired behaviours outside the care–PA initiative	4.27	
81	Personal contact	3.87	
83	Personal approach	4.13	
110	Listen carefully to the participants	4.20	
114	Use role models (for reaching and informing participants)	3.93	
118	Approach dropouts and try to keep them involved (including in the case of injuries, etc.)	4.13	
125	Provide fun, warmth, and togetherness	4.67	
I		**3.87**	**0.40**
17	Encourage fun and social contacts, allowing contact with fellow patients to develop	4.27	
20	Group bonding within the care–PA initiative	3.80	
45	Social purpose as a core element	3.60	
49	Social contacts of the target group	3.80	
96	Social support	3.87	
J		**3.62**	**0.34**
22	Safe	4.36	
38	Focus on physical activity and not just on sports	3.93	
40	Involve family members	3.00	
50	Monitoring of and feedback on results (and progression)	3.73	
61	Combine with nutritional advice	3.07	
66	Work with groups instead of individuals	3.80	
78	Familiar faces	3.93	
79	Transfer knowledge about healthy lifestyles in general	2.57	
92	Location of the care–PA initiative must be close to the daily lives of the participants	4.07	
104	Recognizability (for instance, always the same supervisor)	4.00	
106	Build up personal contact in the recruitment phase	3.47	
115	Small-scale	3.60	
121	Participants are allowed to try-out the initiative	3.53	
K		**2.92**	**0.52**
23	Continuity	4.00	
27	Have knowledge of the social map	3.20	
47	Collaborate with a mental coach	2.33	
52	Presence of a case manager	2.27	
93	Increase or strengthen network	3.60	
98	Healthcare professionals participate too	2.13	

* Importance ratings show the (mean) importance of the clusters and effective elements, based on the ratings by the individual HPEs (1 = not important at all, 5 = very important).

** Bridging scores indicate the level of homogeneity for each cluster (0 = highest homogeneity, 1 = lowest homogeneity). Bridging scores for the individual effective elements indicate whether an element is an 'anchor' or a 'bridging' element, based on their position on the point map [24]. 'Anchor' elements are located at a certain position on the map because they were grouped with elements close to it by many respondents. 'Bridging' elements are located at a certain position on the map because they were sorted with elements on both sides of the map and are therefore placed in the middle of these elements.

Appendix 9.A: Attribute values

Table A.1 Attribute values, displayed per project

Attribute name	Reach (number of participants)				Total costs				Costs per participant	Weight loss				Self-rated health before	Self-rated health after				Self-rated health increase			
Attribute values	1	2	3	4	1	2	3	4	All levels	1	2	3	4	All levels	1	2	3	4	1	2	3	4
1: Lifestyle coaching including PA	5	10	15	20	5500	11,000	16,500	22,000	1100	0	4	8	12	6	6	6.5	7	7.5	0	0.5	1	1.5
2: Lifestyle coaching without PA	5	10	15	20	4000	8000	12,000	16,000	800	0	2	4	6	6	6	6.5	7	7.5	0	0.5	1	1.5
3: Local sports coach	100	200	300	400	25,000	50,000	75,000	100,000	250	0	2	4	6	6	6	6.2	6.4	6.6	0	0.2	0.4	0.6
4: Fruit and vegetable boxes	10	20	30	40	2600	5200	7800	10,400	260	0	2	4	6	6	6	6.2	6.4	6.6	0	0.2	0.4	0.6
5: Bariatric surgery	1	2	3	4	10,000	20,000	30,000	40,000	10,000	20	40	60	80	6	6	6.5	7	7.5	0	0.5	1	1.5
6: Living environment	500	1000	1500	2000	25,000	50,000	75,000	100,000	50	0	1	2	3	6	6	6.2	6.4	6.6	0	0.2	0.4	0.6
7: Courses on healthy lifestyles	100	150	200	250	20,000	30,000	40,000	50,000	200	0	1	2	3	6	6	6.2	6.4	6.6	0	0.2	0.4	0.6
8: Sports vouchers	100	150	200	250	22,500	33,750	45,000	56,250	225	0	2	4	6	6	6	6.2	6.4	6.6	0	0.2	0.4	0.6

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About the author

Lisanne Mulderij was born on 29 December 1992 in Zevenaar, the Netherlands. She spent her childhood in Duiven and graduated from the Arentheem College in Arnhem in 2011. She then started her bachelor Nutrition and Health at Wageningen University and Research, in which she also completed her minor Marketing and Communication at the Free University in Amsterdam. After graduation in 2014, she continued with the master Nutrition and Health at Wageningen University & Research, with the specialisation Epidemiology and Public Health. After her internship at GGD Regio Utrecht, she graduated in November 2016.

Because as an epidemiologist she felt too much distance from the study population, she was excited when she saw a PhD position in social sciences where healthy eating and physical activity were main ingredients. She started her PhD journey in December 2016 at the chair group Health and Society of Wageningen University & Research in Wageningen. Her research focuses on care–physical activity (care–PA) initiatives for people with a lower socioeconomic status, including 1) evaluating the impact of care–PA initiatives on participants' health, quality of life, societal participation and healthcare utilisation; 2) unravelling the effective elements of care–PA initiatives for people with a low SES; and 3) exploring citizen preferences regarding the public funding of projects promoting a healthy body weight among people with a low income. As part of the project, Lisanne wrote several articles, presented on several conferences and organised multiple project-related events. She also supervised multiple bachelor and master students who wrote their thesis as part of the project.

Lisanne's current position as consultant at Proscoop in Zwolle gives her the ability to use her analytical and social skills to organise collaboration between stakeholders for good care and health nearby, focusing on citizens. During her PhD, she has frequently experienced how difficult these kinds of collaborations are, often to the detriment of citizens, which is why she is enthusiastic about supporting these collaborations.

Lisanne lives in Arnhem and is engaged. In her spare time, she loves to hang out with friends and family, to be physically active (inside and outside), to spend time in nature and to bake and cook.

List of publications
(published and forthcoming)

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Lisanne Sofie Mulderij
Wageningen School of Social Sciences (WASS)
Completed Training and Supervision Plan

Name of the learning activity	Department/Institute	Year	ECTS*
Project related competences			
WASS Introduction Course	WASS	2017	1.0
Writing research proposal	WUR	2017	6.0
ETC Summerschool 2017: Public Health Assets	University of Alicante, department of Public Health, Alicante, Spain	2017	8.0
Course on qualitative interviewing	Evers Research & Training, the Netherlands	2017	0.8
Course on focus groups	Evers Research & Training, the Netherlands	2017	0.8
Qualitative Research Summer School	Dublin City University, Dublin, Ireland	2018	2.0
Basics of MKBA	MKBA Onderzoek, the Netherlands	2019	1.0
'Combined lifestyle interventions for vulnerable citizens: what works best?'	10th IUHPE European Conference and International Forum for Health Promotion Research, Trondheim, Norway	2018	1.0
'Samenwerking met partners in de wijk, gemeente en verzekeraars'	ZonMw Werkconferentie 'Samen aan de slag in wijk, school en zorg', Utrecht, the Netherlands	2018	1.0
'Effective elements of Dutch care-physical activity initiatives for adults with a low socioeconomic status'	Sportwissenschaftlicher Hochschultag der dvs, Berlin, Germany	2019	1.0
'The effective elements of care-physical activity initiatives for low SES citizens'	Nutrition disparity and equity: from differences to potential, Wageningen, the Netherlands	2019	1.0
'The effective elements of care-physical activity initiatives for low SES citizens'	10th conference of HEPA Europe, Odense, Denmark	2019	1.0
'Citizen preferences regarding the public funding of projects that stimulate healthy body weight among people with a low socioeconomic status'	PWE PhD colloquium, TU Delft, Delft, the Netherlands	2021	1.0
General research related competences			
Information Literacy	Wageningen UR library	2017	0.6
Reviewing a Scientific Paper	WGS	2017	0.1
Brain training	WGS	2017	0.3
Systematic approaches to reviewing literature	WASS	2017	4.0
Introduction in R	WASS	2018	2.0
Scientific Publishing	WGS	2018	0.3
Scientific Writing	Wageningen in'to Languages	2019	1.8
English Boost Camp: The Power of Words	Wageningen in'to Languages	2019	0.3
Career related competences/personal development			
Lecturer in the course Health Policy and Action, student supervision (BSc- and MSc-theses)	WUR	2016 - 2021	4.0
Grip op je Loopbaan	WGS	2021	1.0
Total			**40.0**

*One credit according to ECTS is on average equivalent to 28 hours of study load