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Financial incentives in primary care lifestyle interventions

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Publication date:
2020

Document Version
Publisher's PDF, also known as Version of record

Link to publication in Tilburg University Research Portal

Citation for published version (APA):
Molema, C. C. M. (2020). *Financial incentives in primary care lifestyle interventions: Feasibility and acceptability of implementing financial incentives for patients*. Ipskamp.

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Feasibility and acceptability of implementing financial incentives for patients

Claudia Molema

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Proefschrift ter verkrijging van de graad van doctor aan Tilburg University,
op gezag van de rector magnificus, prof. dr. K. Sijtsma, in het openbaar te
verdedigen ten overstaan van een door het college voor promoties aangewezen commissie
aan Tilburg University op dinsdag 9 juni 2020 om 10.00 uur

door

Claudia Cornelia Maria Molema

geboren te Amstelveen.

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Cover idea: Claudia Molema en Roy Hendrikx
Cover design: Roy Hendrikx, royhendrikx.nl
Layout and design: Legatron Electronic Publishing
Print: IPSKAMP Printing

ISBN/EAN: 978-94-028-2062-1

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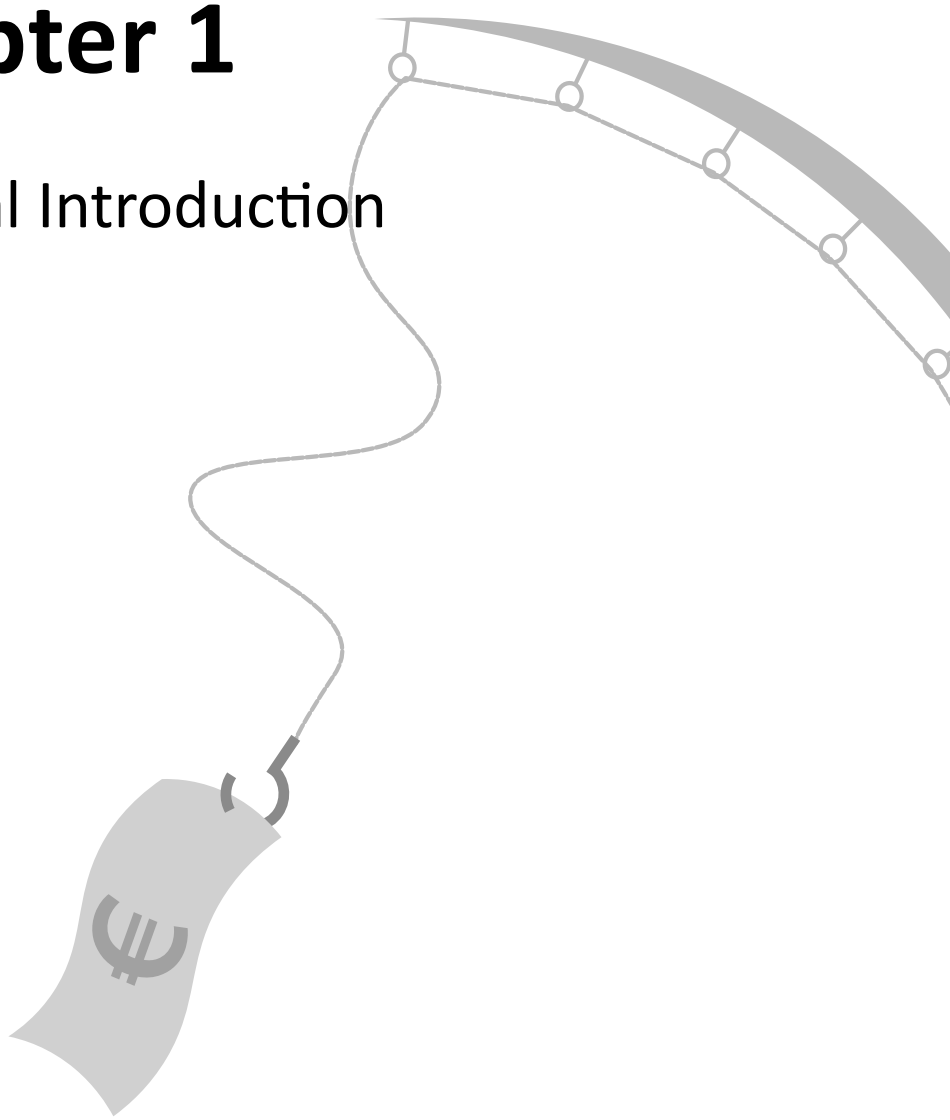
Chapter 1

General Introduction



In the 20th century, health care and living conditions such as air- and water quality, daily hygiene, food quality and prosperity in general improved enormously. This contributed to the reduction of communicable diseases and an increase of the life expectancy from 68 years in 1960 to 80 years in 2016 in the high-income countries [1]. Nowadays, people do live longer, but they also live longer with a chronic illness [2]. NCDs are the leading cause of mortality in the Western countries. Worldwide, 41 million people die because of a NCD or chronic disease each year, which is 71% of all deaths [3]. Increasing knowledge towards the factors that cause these NCDs, like the effect of unhealthy food, the damaging effects of smoking and the use of alcohol, and the effects of the environment on health, results in a more preventive approach towards these diseases. However, prevention strategies are difficult to implement and the participation in preventive interventions is relative low, also because of low motivation of the individuals.

Physical inactivity and unhealthy diets as risk factors for developing chronic diseases

Worldwide, physical inactivity is the fourth leading risk factor for mortality and a large risk factor for morbidity [4]. Sufficient physical activity contributes to the prevention of chronic diseases as diabetes mellitus type 2 (DM2) and cardiovascular disease (CVD) and also to a better course of these diseases. Moreover, it reduces the chance of developing risk factors as hypertension, obesity and diabetes [5-7]. So, physical inactivity has a direct and indirect (through overweight and hypertension) influence on many chronic diseases. These risk factors are also related to diet and nutrition. The 2010 World Health Organization (WHO) physical activity guideline is defined as 150 minutes of moderate-intensity aerobic physical activity throughout the week, or 75 minutes on vigorous-intensity aerobic physical activity throughout the week or an equivalent combination of moderate- and vigorous-intensity activity [5].

In the Netherlands, half of the adults between 18 and 64 years old and over 60 percent of adults older than 65 years, do not meet the recommended physical activity level [8]. Among those aged 80 or over only one fifth of the population is sufficiently active. Moreover, people with one or more chronic conditions are less active (47%) than healthy individuals (51%) and people with overweight (46%) or obesity (35%) are less active than those with normal weight (51%).

Also, the percentage of people with overweight or obesity, although prevalence rates in the Netherlands are relatively low compared to other Western European countries, is rising. This has negative implications for the incidence of for example DM2 and CVD in the future [9]. Table 1 presents the relation between BMI and risk for DM2 and CVD. WHO has acknowledged this worldwide issue and developed the Global action plan on physical activity (GAPPA) to help countries with implementing and scaling up policy actions to improve physical activity.

Table 1. Levels of weight-related health risk for adults [10]

BMI kg/m²	No increased risk of DM2 and CVD	Increased risk for DM2 and CVD*	Co-morbidity**
≥ 25 BMI < 30	Mildly increased	Moderately increased	Moderately increased
≥ 30 BMI < 35	Moderately increased	Moderately increased	Severely increased
≥ 35 BMI < 40	Severely increased	Severely increased	Very severely increased
BMI 40 ≥	Very severely increased	Very severely increased	Very severely increased

Notes: * > 5% increased mortality risk of CVD and/or increased risk assessed by a type 2 diabetes risk score, which includes waist circumference, family history of type 2 diabetes, presence of hypertension, physical inactivity as well as diagnosis of impaired fasting glucose, ** DM2, CVD, sleep apnea and/or arthritis.

Prevention of chronic diseases

Prevention of chronic diseases such as DM2 or CVD can take place at multiple levels (Figure 1). On the left side of the figure, the classical classification of prevention is shown. This classification is different from the one on the right side which was introduced in 2007 by the CVZ (National Health Care Institute) and matches better with prevention within the framework of insured and uninsured forms of prevention activities under the Dutch Care Insurance Act [11]. *Universal prevention* targets the general population, including healthy people and people who are already ill. An example of universal prevention is the project 'Gezonde school' ('Healthy school'). This project helps schools to work on the health of students and teachers by providing for example educational materials for a healthy lifestyle and guidelines for healthy food in school canteens. *Selective prevention* targets subgroups of the general population who are at risk for developing chronic diseases. Offering free testing of blood glucose levels for groups of people with overweight. People with a low income and/ or a low educational level are a subgroup for which selective prevention activities might be helpful. In The Netherlands we have at municipality level the JOGG program (Young People on Healthy Weight approach) which mainly focuses on children and adolescents in disadvantaged areas. *Indicated prevention* and *care-related prevention* activities target at an individual level. Eligible individuals already have risk factors for or symptoms of developing a chronic disease or already suffer from a chronic disease. Specifically for diseases as CVD and DM2, individuals with overweight or obesity are targeted with indicated prevention strategies. For chronically ill patients, interventions that that are part of care-related prevention might be useful to prevent further worsening of the disease. An example of care-related prevention is a cardiac revalidation program for patients who suffered a serious event.

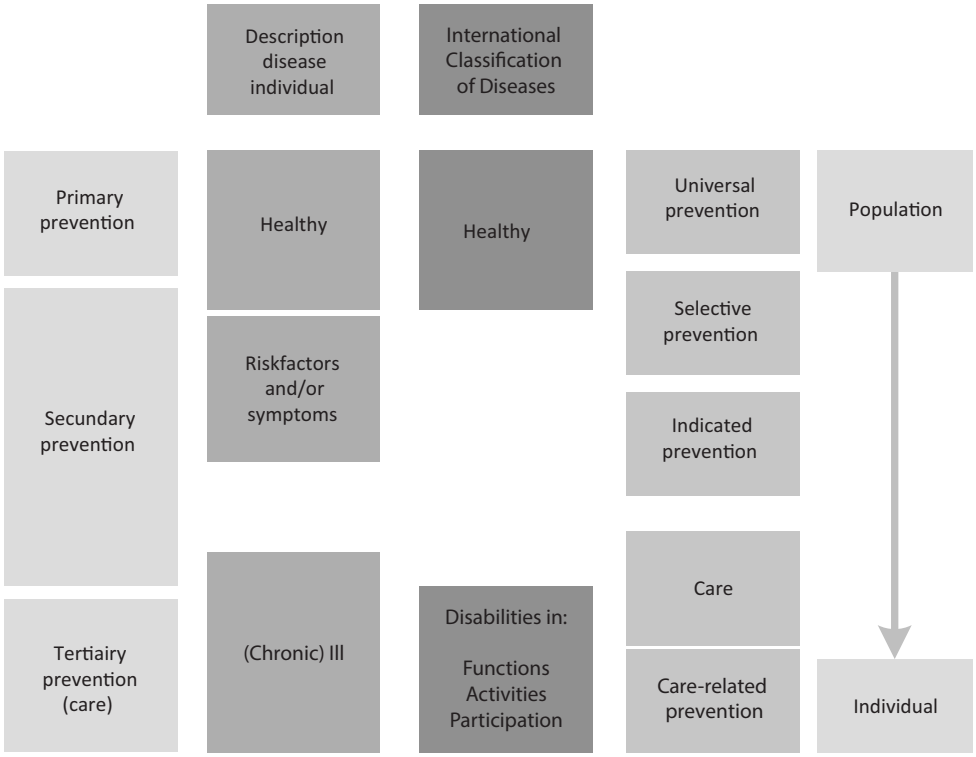


Figure 1. Classification of prevention [11]

Combined lifestyle interventions to promote a healthy lifestyle

To prevent and control chronic diseases that are related to overweight and physical inactivity, as CVD and DM2, WHO has presented recommended interventions including reducing physical inactivity and an unhealthy diet. WHO recommends both selective and indicated prevention strategies in the form of programs that contain education and counselling to improve eating habits and also programs promoting physical activity and lifestyle interventions for patients who already have DM2 or have a high risk of DM2 [12]. A multidisciplinary approach is advisable, because interventions that target both exercise and diet, are more effective than interventions that target only diet of the participants [13].

In this thesis, is defined as a combined lifestyle intervention (CLI), as an intervention that aims to improve physical activity levels and eating habits of a participant at risk for developing a chronic disease, or already have a chronic disease related to overweight or physical inactivity. CLIs aim to prevent development of DM2 or CVD in the high risk group and prevent worsening of the diseases in the patients already ill. In the Netherlands, these CLIs are implemented mainly in primary health care. Examples of CLIs implemented and evaluated in the Netherlands are 'de Beweegkuur', 'SLIMMER', and 'CooL' [14-17]. Based on the literature, CLIs can be

effective in reducing risk for developing DM2 or CVD in individuals, but large variations in results are found [15, 18-22]. Target groups for a CLI may vary, but are mostly patients with, or people with high risk of, DM2 or CVD who receive their care in the primary care setting. Many patients from these target groups need to increase their physical activity level and improve their eating habits. Since the program targets high risk groups and patients, the program can be considered *indicated prevention* and *care-related prevention.*

How to stimulate health behavior?

The behavior change that is aimed for in a CLI can be put in the COM-B system (Figure 2), which is a theoretical framework for understanding behavior. It is part of the Behaviour Change Wheel in which nineteen previously published behavioral change models were included and reduced to a number of simple principles. This model includes conscious and unconscious decision making and the interplay of contextual factors. The factors capability, motivation, and opportunity interact to generate behavior which also influences these components [23]. Capability refers to having the necessary knowledge and skills. Opportunity refers to all the factors that make the behavior possible and lie outside the influence of the individual. The factor motivation refers to all the brain processes that direct and energize behavior. By coaching of an individual by an professional, who also educates the individual on the benefits of exercising and healthy food, also the capability of the person increases. Both factors influence the motivation of the individual and in the end influence the behavior of an individual.

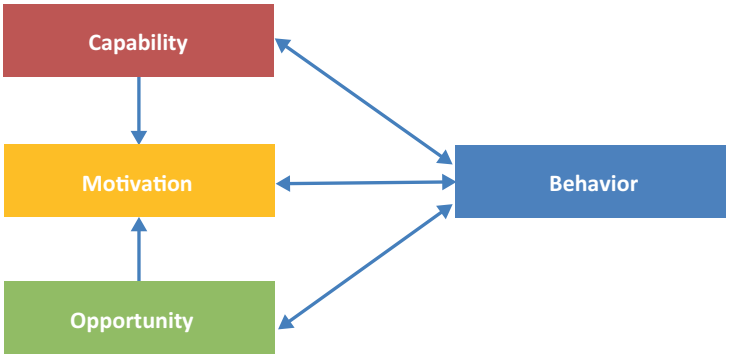


Figure 2. The COM-B system. A theoretical framework for understanding behavior [23]

Definition of health promoting financial incentives

Incentives are a form of external regulation (opportunity in the COM-B system) that can influence the motivation of people to participate in a CLI and might be helpful to support people in the complex process of changing into healthier behavior patterns. A commonly heard argument from health care professionals is that patients are not motivated to participate in a CLI or quit after a few sessions. According to the complex behaviors that influence these choices for healthy behavior and tools that individuals need to be able to change their lifestyle, participating in a CLI is important. An extrinsic motivation in the form of a health promoting financial incentive (HPFI) might help to overcome barriers to participate in a CLI.

The definition of a HPFI is a cash or cash-like reward or fine provided contingent on (non-) performance of healthy behavior [24]. There are two categories of HPFIs: positive and negative incentives. Within these two categories, many variations in the design of the HPFI can be distinguished. For example, the incentive might vary in the value, conditions that the participant has to fulfill to qualify for receiving an HPFI or if the not meet the conditions have to pay a fine, and the form of the HPFI might vary (e.g. cash, voucher). The HPFI could target different behaviors, like treatment adherence or motivating participants to achieve targets in the form of weight loss or better physical condition. HPFIs influence the motivation as is shown before by using the COM-B system. However, HPFIs seem to have most impact on the motivation of an individual. The Self-Determination Theory is a better fit to be able to explain if and how a HPFI can be effective in change in health behavior of individuals.

Self-Determination Theory Model of Health Behaviour Change

Most theories with regard to our intervention, which consists of adding financial incentives to behavior change programs, are aimed at motivation for which the Self-Determination Theory of Health Behaviour Change offers an appropriate explaining framework (Figure 3) [25]. The Self-Determination Theory (SDT) represents a broad framework for the study of human motivation and personality. The SDT defines intrinsic and various extrinsic sources of motivation and a description of the respective roles of intrinsic and types of extrinsic motivation in cognitive and social development and in individual differences. It also focusses on how social and cultural factors facilitate or undermine people's sense of volition and initiative, in addition to their well-being and the quality of their performance [26]. According to the SDT (Figure 3), developing a sense of autonomy, competence and relatedness is essential to the process of internalization and integration of new behavior [25] and to achieve this the activities in a CLI might help to create this new behavior.

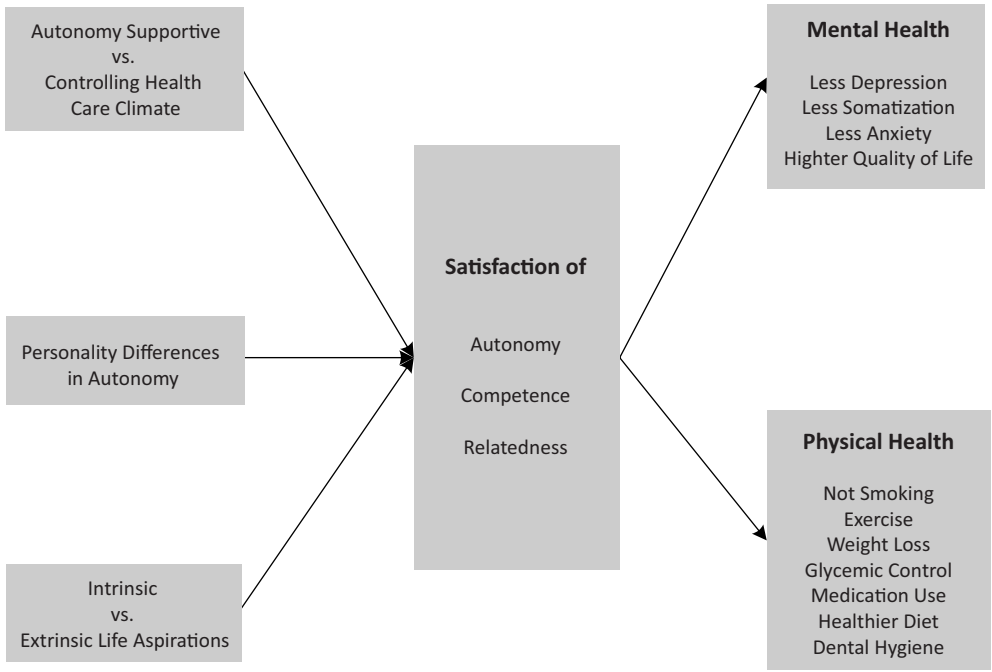


Figure 3. Self-Determination Theory of Health Behaviour Change [25]

Many people perceive health related behaviors like physical activity and healthy eating not as the most enjoyable activities, which makes it difficult to have intrinsic motivation for these activities. Some people lack intrinsic motivation for physical activity and healthy diets. For these people it is important that they understand the value of being physically active related to their overweight and consequently their risk of developing DM2 or CVD. In addition, experiencing the positive effects of physical activity and healthy eating might have a positive effect on the motivation of individuals to persist their improved lifestyle. As shown in the SDT health behavior change is complex, because many factors influence the intrinsic motivation of an individual [26]. Different aspects might decrease the intrinsic motivation of individuals eligible to participate in a CLI. For example, costs of sports activities are of influence on the decision if and what sports activity individuals choose [27]. A recent overview of the literature by the WRR (The Netherlands Scientific Council for Government Policy) showed that individuals do not always put knowledge of healthy behavior into practice which refers to the component 'competence' of the SDT model. Low health literacy has a negative influence on this process, but also the interpretation of the overload of available information and contradictions in all the information are barriers to change unhealthy behavior [28]. Many

CLIs aim to improve participants' knowledge about effects of unhealthy behavior on their health status and this might contribute to the health literacy of the participant.
Extrinsic motivation might be needed to achieve that individuals will overcome barriers that prevent them for participating at all in a CLI. According to the model of Deci et al. external regulation is a form of extrinsic motivation and this can be for example in the form of a HPFI that motivates eligible individuals to participate in the CLI. However, HPFIs are not commonly implemented yet in the Netherlands and limited research has been performed on the implementation of HPFIs for patients in the health care setting in the Netherlands.

Acceptability of health promoting financial incentives

The general public opinion towards HPFIs for health behaviors as smoking cessation or exercising is not univocal. From various studies it appears that about half of the respondents have a positive attitude towards implementing HPFIs [29-34]. The study of Bonevski showed that acceptability ratings for implementing personal financial incentives to motivate smokers to quit were higher among smokers themselves with a lower socioeconomic status or respondents that had made a quit attempt themselves and were intending to quit in the next six months [29]. The study of Lynagh et al. also showed a more favorable opinion towards financial incentives among smokers than non-smokers [31]. This might imply that HPFIs are more accepted by the target group of the incentive, but not that much by the general public. The study of Promberger et al. showed that financial incentives are found to be more acceptable for weight loss than for smoking cessation [34]. The acceptance rate of implementing incentives also seems to be dependent on type of financial incentive and effectiveness of the financial incentive [32, 34].
It is important to find out more about the opinions of both the target group and the general public towards financial incentives to stimulate participation and compliance of a CLI. This can be helpful in increasing the effectiveness of the implementation process, the accompanying communication strategy, and the effort of the scarce time of health care professionals.

Potential effectiveness of health promoting financial incentives

An increasing number of studies is published in which the effectiveness of HPFIs is studied [35-40]. The review published by Mantzari et al. showed that financial incentives can change complex health-related behavior, but reducing the disease burden might be limited due to the fact that the effect disappeared three months after the personal financial incentive was removed [36]. Exercise behavior is a complex health-related behavior and the impact of HPFIs specific on exercise behavior is also unclear yet. The review published by Strohacker et al. showed that HPFIs improved exercise behavior during the intervention, but long-term effects are unclear and differ between studies [40].

Most HPFIs are a temporally addition to the CLI and aim better outcomes by higher participation rates and better compliance. With regard to the potential effectiveness in the long term of an HPFI added to a CLI, different opinions can be found in the literature. On the one hand, the researchers who developed the Self-Determination Theory of Health Behaviour Change argue that health behavior change does not sustain if an extrinsic motivation such as a HPFI is given to the participants of a CLI [41]. On the other hand, the potential participants mostly do not have not enough intrinsic motivation on beforehand and might develop this motivation if they get the opportunity to experience the benefits of being physically active and healthy eating [42]. Extrinsic motivations such as a financial incentive may create this opportunity to experience benefits of being physically active and thus build intrinsic motivation in the participants. By participating for a longer period in a CLI, individuals who change their behavior because of an extrinsic motivation like a HPFI might reach the level of 'identification' as described in the SDT. This is the process in which individuals recognize and accept the value of for example exercising and eating healthy. If they experience the positive effects this has on their health, the extrinsic motivation might transform in the most complete form of internalization of extrinsic motivation, which is 'integration' [26]. In the project described in this thesis, the starting point was in line with the idea that HPFIs could support creating intrinsic motivation in participants.

However, no evidence is available yet with regard to the effectiveness of a HPFI as addition to a CLI in the Netherlands. Insights in the attitude towards HPFIs of health care professionals and end users in the Netherlands are not available yet. Having these insights available is potentially helpful for increasing the chance for a successful implementation of a HPFI. The results of the abovementioned studies cannot be translated directly to the Dutch setting, because health care systems differ between countries and cultural differences might be present.

Course of the research

Initially the purpose of our study was to develop and implement a CLI combined with a HPFI for the primary care in the Netherlands, to study the (cost) effectiveness and to perform a process evaluation. The target group for this CLI consisted of patients with diabetes type 2 and/or cardiovascular disease who were treated in primary care for this chronic illness, who were advised to improve their lifestyle. An additional inclusion criterion was that these patients experience barriers for being physical active.

In the first part of the study the aim was to implement the CLI in which participants were guided in exercising and healthy eating habits. The physiotherapist and dietician were the supposed executors of the CLI. The duration of the CLI was about 12 weeks and afterwards participants were expected to continue exercising at regular sports facilities. Therefore, a so-called care sports connector was involved to guide the participants to regular sports

facilities that they preferred. From the year 2019, selected CLIs are financed in the basic health care insurance. During this project in 2016 and 2017 however, structural funding for the CLI by the basic health care insurance was not available yet. Due to this and other practical barriers, such as the fact that the inflow of participants in the CLI in the study region fell short during implementation, we altered the aim and work plan of our research project. In consultation with ZonMw, the main funder, it was decided to concentrate on the evaluation of the implementation process of CLIs in general and what influence HPFIs could have on this process. On top of that, an additional study was performed on the attitude of eligible participants of a CLI and of the general public towards a HPFI and which characteristics of eligible participants might influence the preferences for a HPFI.
This resulted in four research questions that will be discussed in this thesis:
What is known from the research literature about the effectiveness of HPFIs used for promoting physical activity in the health care setting?

- What are preferences of eligible participants of a CLI (chronic ill patients and those with high risk) with regard to form and content of a HPFI added to a CLI and are there individual differences in preferences?
- Which factors are facilitators or barriers for successful implementation of a CLI in the primary health care setting and which factors facilitate adding a HPFI to stimulate participation in such a CLI?
- What is the attitude of the general public and the target group of a CLI (chronic ill patients and those with high risk of chronic disease) towards providing a HPFI to stimulate participation in a CLI?

Overview

This thesis is composed of two parts addressing the feasibility of implementing HPFIs as supplement to CLIs and the level of acceptance of such financial incentives by both the target population and the general population. The first part contains three chapters. In **chapter 2** we gained insight in what is known in the research literature on the effectiveness of HPFIs used to promote physical activity in the health care setting. In **chapter 3** we have studied the preferences towards HPFIs added to a CLI of patients with a chronic disease by applying a discrete choice experiment. **Chapter 4** describes the results of a process evaluation on the implementation of CLIs in the primary health care setting (as done in several care groups in the Netherlands) and also the attitudes and opinions towards implementing HPFIs as addition to a CLI.
In the second part, **chapter 5** shows if and to what extent characteristics of an individual are related to the preferences towards a HPFI. In **chapter 6** the results are presented of a focus group study on the attitudes of different groups (eligible participants for participating in a CLI and the general population) towards offering HPFIs to promote participation in a CLI are presented.

In the general discussion (**chapter 7**) Discussion chapter, the results of this thesis will be discussed in broader perspective. Moreover, practical implications and strengths and limitations of the study will be described, followed by an overall conclusion.

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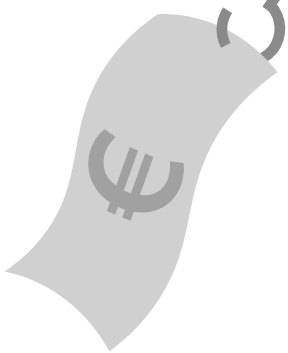
Chapter 2

A systematic review of financial incentives given in the healthcare setting; do they effectively improve physical activity levels?



Molema, C. C. M., Wendel-Vos, G. C., Puijk, L., Jensen, J. D., Schuit, A. J., & de Wit, G. A. (2016).

A systematic review of financial incentives given in the healthcare setting; do they effectively improve physical activity levels? BMC Sports Sci Med Rehabil, 8, 15. doi:10.1186/s13102-016-0041-1

Abstract

Background: According to current physical activity guidelines, a substantial percentage of the population in high-income countries is inactive, and inactivity is an important risk factor for chronic conditions and mortality. Financial incentives may encourage people to become more active. The objective of this review was to provide insight in the effectiveness of financial incentives used for promoting physical activity in the healthcare setting.

Methods: A systematic literature search was performed in three databases: Medline, EMBASE and SciSearch. In total, 1395 papers published up until April 2015 were identified. Eleven of them were screened on in- and exclusion criteria based on the full-text publication.

Results: Three studies were included in the review. Two studies combined a financial incentive with nutrition classes or motivational interviewing. One of these provided a free membership to a sports facility and the other one provided vouchers for one episode of aerobic activities at a local leisure center or swimming pool. The third study provided a schedule for exercise sessions. None of the studies addressed the preferences of their target population with regard to financial incentives. Despite some short-term effects, neither of the studies showed significant long-term effects of the financial incentive.

Conclusions: Based on the limited number of studies and the diversity in findings, no solid conclusion can be drawn regarding the effectiveness of financial incentives on physical activity in the healthcare setting. Therefore, there is a need for more research on the effectiveness of financial incentives in changing physical activity behavior in this setting. There is possibly something to be gained by studying the preferred type and size of the financial incentive.

Introduction

In high-income countries, 41% of men and 48% of women have an inactive lifestyle, based on the World Health Organisation (WHO) Global physical activity guidelines [1, 2]. According to the WHO, physical inactivity is defined as not adhering to physical activity guidelines, thus spending less than 150 minutes of moderate-intensity aerobic physical activity throughout the week, or less than 75 minutes on vigorous-intensity aerobic physical activity throughout the week or less than an equivalent combination of moderate- and vigorous-intensity activity [2]. Physical inactivity has negative consequences for people's health, as it is the fourth leading risk factor for mortality worldwide and it increases the risk of cardiovascular diseases, obesity and diabetes [1-3]. Physical activity can reduce the risk of several chronic conditions, such as diabetes and cardiovascular diseases. Moreover, it is associated with more favorable outcomes in the course of disease. If people would achieve the recommended level of activity, an all-cause mortality risk reduction of almost 30% would be possible [4]. Still, a substantial proportion of the high-income population is insufficiently active. It is therefore important to find ways to improve physical activity levels, particularly among those who are the least active. However, behavior such as physical activity is complex and therefore difficult to change, implying a serious challenge concerning program adherence and maintaining results after program completion [5, 6].

One setting from which physical activity programs are initiated is the healthcare setting. Many people with (a high risk of) a chronic disease are already within the healthcare setting for treatment of their condition. For these people being physically active to a sufficient extent may be important to prevent a deterioration of their condition. At the same time, healthcare providers can play an important role in motivating patients to participate in a physical activity program [7]. However, research shows that long-term adherence varies greatly between 10% and 80% in therapeutic exercise interventions for diabetes patients [8]. There are many reasons that people find it difficult to adhere to exercise schemes, one of which is motivation One of many ways to address motivation is to include financial incentives in the intervention. Financial incentives provide economic encouragement for people to show desired behavior, such as increasing their physical activity level [9]. Incentives can be either positive or negative. Positive incentives reward individuals either for participation or for when they fulfill the desired outcome of certain health behavior. Negative incentives or disincentives penalize individuals if they do not participate, or if they do not meet the required outcomes established [10].

Financial incentives have the potential to affect both participation rates and program adherence [11, 12]. An important point to address however when studying and discussing effectiveness of financial incentives on behavioral change, is the general notion that a financial incentive constitutes an external motivation for changing behavior. According to the health promotion literature, people need skills and knowledge (intrinsic motivation) to

change their lifestyle behavior and simply giving them a financial incentive is not expected to teach them these skills [10, 13, 14]. Building intrinsic motivation takes time and needs work, but financial incentives may help, for instance to increase program adherence to an intervention that teaches these skills and knowledge. Financial incentives can be provided on many levels in healthcare, for example incentives for insurers to promote the financing of exercise programs, for healthcare providers to incorporate physical activity in treatment and rehabilitation, for employers to establish training facilities at work places, or for patients to participate. The providers of the incentives also vary, depending on the healthcare system in a country. Incentives can be provided by the government, insurers, employers or non-profit organizations. The government may have an interest in this, if the benefits to society and/ or the government budget (in terms of potential for saved healthcare spending in the long run) exceed the cost of providing the incentive. Similar rationales may apply for insurer- and employer-financed incentive schemes.

Hypotheses on the effectiveness of direct financial incentives to improve physical activity levels vary. One opinion is that offering rewards may be counterproductive in the sense that this extrinsic motivation may crowd out the intrinsic motivation already present. Therefore any increase in physical activity during the time of the intervention, as well as part of the activity level present before the intervention started, will disappear after the incentives are removed [15-17]. A competing hypothesis states that getting people interested in physical activity by giving financial incentives may very well contribute to habit formation. This theory assumes that if exercising is a form of habitual behavior, giving financial incentives to motivate people to exercise for a certain period, may increase future utility from exercising [15, 18]. Previous studies on the effect of financial incentives to change relatively simple health-related behaviors, such as attending appointments at clinics and take up of child immunization, indicate that financial incentives are effective [10, 15]. Systematic reviews on effectiveness of financial incentives to increase physical activity showed positive results in both community- and school setting, particularly in the short term [11, 12]. No such systematic review has been carried out for the healthcare setting. The objective of this study was to systematically review the literature with respect to the effectiveness of direct financial incentives used to promote physical activity in the healthcare setting.

Methods

Data sources

A systematic literature search was conducted, using three literature databases (Medline, EMBASE and SciSearch) to find eligible studies on the effect of financial incentives to promote physical activity within a healthcare setting. A combination of search terms covering the healthcare setting (e.g. primary care, delivery of healthcare), financial incentives (e.g. financial support, access and price) and physical activity (e.g. leisure center, active transport) was used to identify all relevant articles (see Appendix 1 for the full search strategy). The search was restricted to publications in English and Dutch and included publications up until April 2015.

Inclusion and exclusion criteria

The primary inclusion criterion was that the paper under consideration had to address physical activity promotion initiated from or within the healthcare setting, including the use of one or more direct financial incentives given to patients. Included studies had to use a prospective design to be able to measure differences over time in individuals and at group level, and provide one or more study arms in which the financial incentive was the exclusive factor, while the goal was to increase people's physical activity. Effectiveness had to be studied quantitatively in terms of physical activity outcome measures or weight loss. Reviews, editorials and other papers not describing individual studies were excluded. Figure 1 shows the flowchart that contains all exclusion criteria. If one of the criteria was not met, we scored this item a '1'. The criteria were scored in a fixed order; if a criterion was scored a '1', assessment of further criteria became redundant.

Study selection

Publications were selected using a standardized process. Four reviewers (LP, WV, CM and AW) worked in pairs. The first reviewer (LP, CM or WV) selected eligible papers by checking the title against the in- and exclusion criteria and if necessary the process was repeated for the abstract. Another reviewer checked whether the exclusion of the paper by the first reviewer was correct. Any disagreement between reviewers was resolved by consensus. References from the selected full text publications based on their abstract (n=11) were searched for more eligible publications, but did not result in the inclusion of additional publications to be included. Duplicate studies were removed. The process of study selection and reasons for excluding studies are shown in Figure 1.

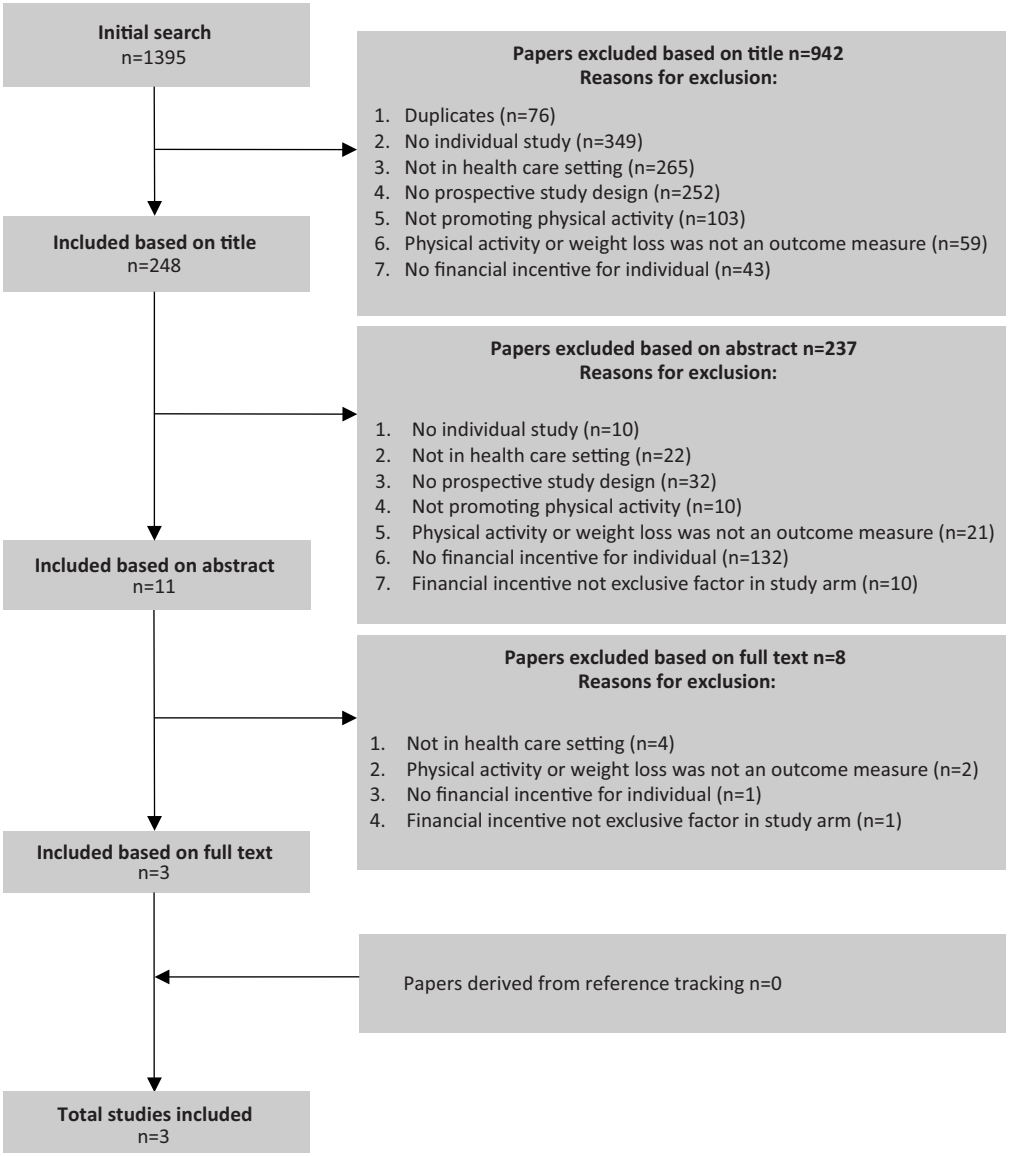


Figure 1. Flow chart describing the systematic search

Data extraction

Information was extracted about the first author, year of publication, the setting in which the study was conducted, the study population, description of the intervention and the given incentive, and relevant outcome measures and quantitative results. Table 1 provides a structured overview of the characteristics of the studies included in this review.

Results

Search

In total 1395 papers were found of which 76 papers were duplicates. Based on title and abstract, 1308 publications were excluded. Eleven full-text papers were selected and scored according to the in- and exclusion criteria individually by two reviewers. Finally, three papers, describing randomized controlled trials (RCT) were included (Figure 1). These studies are summarized in Table 1.

Study populations, designs and settings

All three included studies describe a RCT. Harland et al. evaluated the effectiveness of several combinations of methods to promote physical activity using brief (one) or extended (six) motivational interviews and a financial incentive for PA promotion (30 vouchers each for one episode of aerobic activities at a local leisure center or swimming pool). This study was performed in the United Kingdom in the primary care setting and involved the local leisure center. In total, 523 adults between 40 and 64 years old were recruited from one urban general practice in a socioeconomically disadvantaged region of Newcastle.

The study of Duggins et al. was designed to address the question, of whether eliminating financial barriers to physically activity leads to weight loss. This study was performed in the USA in the primary care setting in combination with the local Young Men's Cristian Association (YMCA). In total, 83 children between 5 and 17 years old were recruited in two family medicine clinics and a specialized pediatrics clinic. Patients were eligible if they had a BMI at or above the 85th percentile for age and sex, and the socioeconomic status of the participants varied widely. In the study, participating families were randomized in an intervention group and a control group. Both groups received nutrition advice through four nutrition classes, and to promote physical activity the intervention group received a financial incentive (family membership of the local YMCA). The materials were available in English and Spanish in order to also include Spanish-speaking families.

The study of Islam evaluates a financial incentive in a physical activity program for 22 women of at least 18 years old, who have used cocaine regularly in their lives. The study was performed at Rubcion, a non-profit organization for substance abuse in the USA. Women were eligible

if they were approved for 60 days of residential treatment at Rubicon and received medical clearance from the physician to participate. Both groups had an exercise schedule of three weekly sessions for a period of six weeks. In addition, the intervention group had an incentive scheme. If they met their targets in their exercise schedule, participants were allowed to draw tokens from a prize gym bag.

Financial incentives

All three studies have combined a financial incentive with some other technique, such as motivational interviewing, education or exercise sessions. However, these additional techniques were provided to the individuals in both the intervention group and the control group. As studies were only included in this review when the financial incentive was the only difference between study groups, any effect observed can be assigned to the financial incentive. The incentives in the included studies diverge in their characteristics, such as the value they represent, the requirements to receive the incentive and the moment of handing out the incentive.

Both the studies of Harland et al. and Duggins et al. chose an incentive that is linked to physical activity. The study of Islam chose an incentive in the form of simply a compliment or presents of different values, such as toiletries, jewelry or a digital camera. The higher the value of the incentive, the lower the chance they could grab that prize from the prize gym bag. The study of Islam set requirements in such a way that the participants were only allowed to grab a prize from the prize gym bag if they met their target of 30 minutes of observed treadmill walking. Some additional prizes could be earned if their adherence to the program was high. In contrast with the study of Islam, the studies of Harland et al. and Duggins et al. did not have requirements that the participants had to meet before they received the incentive.

The studies of Harland et al. and Duggins et al. did not report that the content of the financial incentive was matched with the preferences of the target group. The study of Islam surveyed the participants beforehand and during the intervention to identify which prizes were preferred and whether they were still incentivizing during the intervention. They did not report that they surveyed the preferences for other characteristics, such as the moment of handing out and the requirements for receiving the incentive.

Study outcomes

Harland et al. evaluated the effectiveness of several combinations of methods to promote physical activity. Data were collected at baseline, at 12 weeks, and after one year. After 12 weeks of intervention, significantly more participants in the intervention group had improved physical activity scores compared to the control group (38% vs. 16%, p=0.001). A significant interaction was found between the two intervention conditions (interviews and vouchers) with the greatest effect in the group offered both vouchers and extended interviewing. In

general, this pattern was also found when focusing on only vigorous and moderate physical activity. Comparing the matching groups with regard to the number of motivational interviews, no statistically significant effects were found for providing vouchers as a financial incentive as opposed to not providing this incentive. Moreover, effects found at 12 weeks were not maintained one year after the intervention, regardless of the intensity of the intervention. However, the use of vouchers was higher (44% versus 27%) among the group that received the intensive intervention (vouchers + six interviews) than in the group that received the brief intervention (vouchers + one interview).

In the study of Duggins no differences in Body Mass Index (BMI) or weight change were seen between the intervention and control group after the one-year intervention period. In the intervention group, the relationship between the number of visits to the YMCA and the loss of either BMI or weight was positive, but very small and not statistically significant.

After the six week intervention period, the study of Islam reported no significant changes over time in both groups for attitude and perception on benefits of participating in exercise, physical activity levels, compliance, BMI, and Waist Hip Ratio (WHR).

Table 1. Characteristics and outcomes of the reviewed studies

Author, year	Setting	Study design & study population	Intervention	Outcome measures	Results
Harland et al., 1999 [19]	GP practice in a socio-economically disadvantaged area.	RCT 523 adults aged 40–64 years: C: n=105 I1: n=105 I2: n=106 I3: n=104 I4: n=103	**C** – Baseline body measurements and information about PA. **I1** – Baseline body measurements and information about PA. – Brief motivational interviewing (n=1) during 12 weeks intervention period. **I2** – Baseline body measurements and information about PA. – Brief motivational interviewing (n=1) during 12 weeks intervention period. – 30 vouchers, each for one episode of aerobic activities, at local leisure center or swimming-pool. **I3** – Baseline body measurements and information about PA. – Extended motivational interviewing (n=6) during 12 weeks intervention period. **I4** – Baseline body measurements and information about PA. – Extended motivational interviewing (n=6) during 12 weeks intervention period. – 30 vouchers, each for one episode of aerobic activities, at local leisure center or swimming pool.	– Self-reported physical activity (shortened version of the National Fitness Survey questionnaire).	**12 weeks:** – No significant effect on PA was found due to the introduction of vouchers or more than one interview. – Significant interaction between providing vouchers and more than one interview: the highest proportion of participants with increased physical activity scores was in the group offered both multiple interviews and vouchers. – Proportion of participants with an improvement on vigorous activity or moderate activity was significantly higher for all intervention groups combined compared to the control group. – No significant effect within the intervention groups due to interviews, vouchers or interactions between them for vigorous or moderate activity. **12 months:** – Increases in PA reported at 12 weeks by participants in all intervention groups were not maintained at one year, regardless of the intensity of the intervention.

Author, year	Setting	Study design & study population	Intervention	Outcome measures	Results
Duggins et al., 2010 [20]	Family Medicine Clinics and specialized Pediatrics clinics with patients that represented a wide variety of socioeconomic backgrounds.	RCT 83 children aged 5-17 years, with BMI at or above the 85th percentile for age and sex: C: n=39 I: n=44	**C** – 4 dietician-led nutrition classes (over a 9 months period), discussing diet, nutrition, eating habits and meal planning. In addition, written materials (handbook) were provided. **I** – 4 dietician-led nutrition classes (over a 9 months period), discussing diet, nutrition, eating habits and meal planning. In addition, written materials (handbook) were provided. – Free 1-year family membership to local YMCA, providing access to all activities, such as swimming, water aerobics, a track for walking or jogging and weights in a variety of sizes. Patients were asked to complete a diary of activities and were reinforced by study staff.	– Year change in BMI-for-age percentile and weight loss	**12 months:** – No significant differences between groups were found in BMI or change in weight. – The relationship between the number of visits to the YMCA and the loss of either BMI or weight was positive, but very small and not statistically significant.

Author, year	Setting	Study design & study population	Intervention	Outcome measures	Results
Islam, 2013 [21]		RCT 22 women aged at least 18 years old, who have used cocaine regularly in her lifetime, be approved for 60 days of residential treatment at Rubicon and received medical clearance from the physician to participate: C: n=10 I: n=12	**C** – Three core exercise sessions scheduled weekly for six weeks, with the opportunity to engage in additional exercise. **I** – Three core exercise sessions scheduled weekly for six weeks, with the opportunity to engage in additional exercise. – Participants had the opportunity to draw tokens from a prize gym bag if they met the target of 30 minutes of observed treadmill walking at any intensity. Every time a participant completed the 30 minutes at a level, she received an escalating number of prize draws. Escalation resumed from baseline (two draws) until the participant completed three consecutive sessions that met the completion of 30 minutes of exercise criteria. At that time, the number of draws returned to the level achieved prior to reset. Participants received bonus draws if they completed moderate exercise up to 3 times a week.	– Compliance – Anthropometric measurements (BMI and WHR) – Attitudes about exercise (ECS,EBBS and IPAQ-S) – Physical activity levels	**6 weeks:** – No significant differences were found in minutes spent in exercise sessions, number of completed scheduled 30-minute exercise sessions, number of consecutive exercise sessions. – No differences over time were found for both intervention- and control group in BMI and WHR. – No differences over time were found for both intervention- and control group on patients' attitudes about exercise and in the perception of individuals concerning the benefits of and participating in exercise. – No differences over time were found between intervention- and control group in physical activity levels

Abbreviations used: BMI= Body Mass Index; C= control group; EBBS= Exercise Benefits/Barriers Scale; ECS= Exercise Confidence Scale; GP= general practitioner; I= intervention group; IPAQ-S= International Physical Activity Questionnaire – Short; PA= physical activity; RCT= Randomized Controlled Trial; YMCA= Young Men's Christian Association; WHR = Waist-to-hip ratio

Discussion

The objective of this systematic review was to provide an insight in the effectiveness of financial incentives used for physical activity promotion in the healthcare setting. The search revealed only three eligible studies (two RCTs among adults and one among children) that specifically studied the effect of a financial incentive on improving physical activity measured by physical activity outcomes or weight loss [19-21]. Two of the three studies combined a financial incentive with other methods, such as motivational interviewing or nutrition classes [19, 20]. Despite short-term differences between intervention groups in one study, no differences were found between the control and intervention group over a longer period of time (12 months) in these studies [19, 20]. The study of Islam measured only short term effects and found almost no significant improvements in the intervention group [21]. The included studies do not indicate that financial incentives stimulate physical activity in the healthcare setting.

Two studies included in this review found no long-term effects of the financial incentive. The third study did not measure long-term effects, but did not find important effects in the short term [21]. Harland et al. found some short-term effects. Possibly, the duration and/or intensity of intervention activities in these studies were not enough to alter behavior, since effects regardless of the incentive were small or absent. A well-known physical activity intervention strategy in the healthcare setting is exercise on prescription, which is usually integrated into multidisciplinary combined lifestyle interventions. Such programs tend to include physical activity promotion, improvement of diet, and reduction of psychological barriers using motivational interviewing [22]. Two studies included in this review did not consist of a strong and structured physical activity component, which might have caused participants to focus on other aspects of the intervention than actually becoming physically active [19, 20]. The study of Islam had a structured physical activity component, but the duration was just six weeks [21].

Although the effectiveness of financial incentives on increasing physical activity levels and accomplishing weight loss was generally absent in our review, in other settings, such as the community setting, at least short term effects of financial incentives on physical activity behavior were found [11, 12]. The review of Mantzari et al. has evaluated the effect of financial incentives on health-related behavior, which includes for example healthier eating, physical activity, and smoking cessation. In this review it is also acknowledged that effects are not sustained when the incentive is removed [23].

In all three studies included in our systematic review, a motivation was lacking as to why this particular incentive was chosen for the particular population. It is likely that preferences for a certain type of financial incentive differ between target groups. For example, women may be more risk adverse than men so a financial incentive in the form of a lottery might

not be as effective for men as for women [24]. If the specific type of incentive does not fit the preferences of the target population, this may partially explain the lack of its effect on behavior. There is research available that elucidates the importance of some attributes of financial incentives. A broader scoped review on the effectiveness of financial incentives on physical activity showed that for an incentive to be effective it should at least be conditional to the targets set in the intervention [25]. Promberger et al. [26] have performed a discrete choice experiment on the acceptability of financial incentives to change health related behavior. They have found that a preference for the type of incentive for smoking cessation is different than the preferred incentive for weight loss [26]. Moreover, the size of the incentive matters [10] and includes an optimum [27]. Therefore, one important recommendation would be to study preferences of the target group to determine a suitable financial incentive before designing and implementing a study.

In a recently published review of reviews the effectiveness of physical activity promotion interventions in the primary care are shown. These interventions seem to have small positive effects [28]. Combining a lifestyle intervention with a financial incentive that is preferred by the target population, might increase the effects on physical activity levels of the individuals. Future research should focus on the most effective combination of the lifestyle intervention and the preferred financial incentive of the target population.

Theoretically, the benefits of the investment in a financial incentive returns to the provider of the incentive, for example in the form of decreased use of healthcare. In national health systems such as in the UK, the provider of the incentive in the healthcare setting is automatically the collector of the benefits. In managed competition systems, insurers might be the provider of incentives with the underlying principle of return on investment, but also gain a competitive advantage in a market with many healthcare insurance providers. It should be acknowledged that financial incentives in the healthcare systems of developing countries might be a bridge too far. The theory of return on investment is a concept that might function as well in healthcare as in the work setting. A review shows that giving incentives in the work setting to employees by providing free wellness programs, and sometimes incentives to increase participation, returns in less healthcare expenditures and less costs for absenteeism [29]. As mentioned before, the present systematic review includes only three studies. We believe however that this is a true reflection of the level of knowledge, despite the fact that the use of financial incentives is fairly common. For example, during many physical activity interventions, participants can freely access sports and/or leisure accommodations or they receive a small reward for participating in the intervention [30, 31]. However only a few studies explicitly address the effectiveness of the incentive given in a separate arm of the study, as was one of the inclusion criteria in our study. There were some studies excluded from the review that stated as their aim to evaluate the effect of changing physical activity behavior by giving financial incentives. A closer look at the study methods revealed that this statement could not

be justified because of different reasons. These sub-optimal study designs prevented drawing definite conclusions on the effectiveness of financial incentives on physical activity behavior, because for example the effect of the financial incentive could not be distinguished from the other components of the study or the study did not have a control group [24, 30-32].

We decided not to perform a quality check for the included studies. With a yield of only three very diverse interventions addressing the effect of financial incentives on physical activity our review, although systematic in nature, may be characterized as explorative rather than thoroughly addressing the effectiveness of financial incentives in promoting physical activity from the healthcare setting.

One could argue that extending our search with other databases such as EconLit, Psychlit and Sportsdiscus might have increased the yield of the review. However, if we would have missed a key publication, we would have expected it to be found through reference tracking of the studies already included. The limited set of appropriate study designs is confirmed in other systematic reviews. Two other systematic reviews evaluating the effect of financial incentives on physical activity irrespective of the setting included as few as 10 and 11 studies [11, 12]. Moreover, most of the studies included in these reviews defined 'attendance' as the incentivized behavior instead of behavioral change. This could also partly explain why few studies are found to be effective in actually changing physical activity behavior. Perhaps incentives may only offer the particular behavior that has been incentivized.

Conclusion

Few studies have evaluated the effect of a financial incentive on changing physical activity behavior in the healthcare setting. The three studies included in this systematic review did not show effects that could be attributed to the incentive used. However, study designs were not particularly strong and there seems to have been little thought given to whether or not particular incentives suit particular study populations. Nevertheless, based on results in other settings, financial incentives seem promising instruments to increase people's physical activity.

It is recommended that in future research on the effectiveness of financial incentives on physical activity some basic requirements are met. First, the study protocol should include intervention arms in such a way that effectiveness of incentives can be studied. Second, it is recommended to first study the preferences of the target population with regard to financial incentives to maximize the chance that the incentive will indeed help to increase the intended behavior. Assuming that the control condition will include a program aiming to increase physical activity, it is recommended to consider multidisciplinary combined lifestyle interventions in order to maximize the chance of habit formation and long-term maintenance of behavioral change.

Declarations

List of abbreviations

BMI= Body Mass Index; C= control group; EBBS= Exercise Benefits/Barriers Scale; ECS= Exercise Confidence Scale; GP= general practitioner; I= intervention group; IPAQ-S= International Physical Activity Questionnaire – Short; PA= physical activity; RCT= Randomized Controlled Trial; YMCA= Young Men's Christian Association; WHO= World Health Organisation; WHR = Waist-to-hip ratio

Ethics approval and consent to participate

Not applicable

Consent of publication

Not applicable

Availability of data and materials

Appendix 1 shows the full search strategy of the review.

Competing interests

The authors declare that they have no competing interests.

Funding

This research was supported by ZonMw. ZonMw is the Dutch national organisation for health research and healthcare innovation

Authors' contributions

JS, AW, WV and JJ made substantial contributions to the design of the review. CM, WV, AW, and LP have performed the selection of the studies eligible for the review. CM has written the main part of the manuscript. All authors critically reviewed the manuscript and read and approved the final manuscript.

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Appendix 1

Table 2. Full search strategy

1	(incentive* or reward* or voucher or free access or lottery or lotteries or voucher*1 or prize* or monetary support or financial support or financial assist* or cost sharing or medical fees or subsidy or subsidies or cash payment* or contingent payment* or bonus* or loan* or credit* or member* or financing or disincentive* or penalty or penalties).tw.
2	financial support/ or financing, organized/ or financing, government/ or cost sharing/ or fees, medical/ or "fees and charges"/ or public assistance/
3	(access or participation rate* or "frequency of participation" or sustained participation or increased participation or repeated participation or attendance or (complet* adj3 program) or referral uptake or "used the prescription" or "uptake rate*" or (received adj3 pedometer*) or offered or half price).tw.
4	exercise therapy/ut or "referral and consultation"/ut or counseling/ut or health promotion/ut or health services/ut
5	1 or 2 or 3 or 4
6	(intervention* or program*1 or project*1 or pilot*1 or policy or policies or trial* or increas* or campaign or sustain* or encourag* or motivat* or promot* or improv* or counsel?ing or participation or health facilit*).ti.
7	intervention studies/ or health promotion/ or health plan implementation/ or healthy people programs/ or national health programs/ or government programs/ or program development/ or program evaluation/ or pilot projects/ or exp clincial trials/ or counseling/ or health facilities/ or exercise therapy/ or motivation/
8	(excercise referral* or referral program* or exercise program* or excercise promotion or exercise advice*).tw.
9	6 or 7 or 8
10	(physical activit* or exercise or aerobics or aerobic capacit* or aerobic class* or aerobic activ* or physical exert* or moderate activ* or vigorous activ* or sport* or fitness or "keep fit" or gymnas* or gym or walking or walk or running or run or jogging or jog or cycle or cycling or bicycl* or bike*1 or biking or swimming or swim or swims or dancing or gardening or stair*1).ti.
11	(aqua* or yoga* or pilates* or rollerblad* or rollerskat* or skate or skates or skating).ti. or (leisure centre* or leisure center*).tw.
12	(active travel* or active transport* or active commut* or multimodal transportation or alternative transport* or alternative travel* or pedestrianis* or pedestrianiz).ti.
13	motor activity/ or exp exercise/ or exercise therapy/ or exp sports/ or fitness centers/ or walking/ or running/ or jogging/ or bicycling/ or swimming/ or dancing/ or gardening/ or "physical education and training"/ or gymnastics/ or physical fitness/
14	10 or 11 or 12 or 13
15	9 and 14
16	(health care or health care or primary care or primary health care or preventive care or preventive medicine or health promotion or integrated care or behavi?r therap* or referral scheme* or hospital* or physician* or nurse* or nursing or general practi* or gp or family practi* or doctors or public health).tw.

17	delivery of health care/ or delivery of health care, integrated/ or primary health care/ or preventive medicine/ or preventive health services/ or primary prevention/ or behavior therapy/ or hospitals/ or physicians/ or physicians, family/ or physicians, primary care/ or family practice/ or general practice/ or general practitioners/ or nursing/ or nurses/ or “referral and consultation”/ or public health/
18	16 or 17
19	5 and 15 and 18
20	(employee* or worker* or work or job or jobs or occupational or school* or pupils or student* or athletes or athletic* or sports medicine or wounds or injuries or injury or incontinence or pregnancy or pregnant or pain or cancer).tw. or injuries.fs.
21	work/ or occupational health/ or occupational health services/ or occupational health physicians/ or employee incentive plans/ or schools health services/ or schools/ or students/ or student health services/ or athletes/ or athletic performance/ or sports medicine/ or exp “wounds and injuries”/ or urinary inconticence/ or exp pregnancy/ or rehabilitation/ or exp pain/ or pain management/ or exp neoplasms/ or sports/px
22	19 not (20 or 21)
23	22 and (english or dutch).lg.
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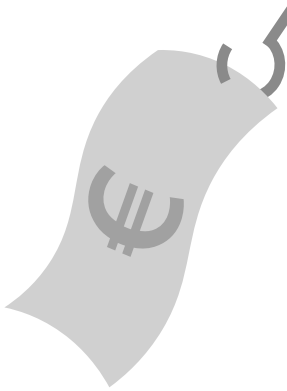
Chapter 3

Chronically Ill Patients' Preferences for a Financial Incentive in a Lifestyle Intervention

Results of a Discrete Choice Experiment



Molema, C., Veldwijk, J., Wendel-Vos, W., de Wit, A., van de Goor, I., & Schuit, J. (2019).

Chronically ill patients' preferences for a financial incentive in a lifestyle intervention. Results of a discrete choice experiment. PLoS One, 14(7), e0219112. doi:10.1371/journal.pone.0219112

Abstract

Background: The preferences of diabetes type 2 patients and cardiovascular disease patients for a financial incentive added to a specified combined lifestyle intervention were investigated.

Methods: A discrete choice experiment questionnaire was filled out by 290 diabetes type 2 patients (response rate 29.9%). Panel-mixed-logit models were used to estimate the preferences for a financial incentive. Potential uptake rates of different financial incentives and relative importance scores of the included attributes were estimated. Included attributes and levels were: form of the incentive (cash money and different types of vouchers), value of the incentive (ranging from 15 to 100 euros), moment the incentive is received (start, halfway, after finishing the intervention) and prerequisite for receiving the incentive (registration, attendance or results at group or individual level).

Results: Prerequisites for receiving the financial incentive were the most important attribute, according to the respondents. Potential uptake rates for different financial incentives ranged between 37.9% and 58.8%. The latter uptake rate was associated with a financial incentive consisting of cash money with a value of €100 that is handed out after completing the lifestyle program with the prerequisite that the participant attended at least 75% of the scheduled meetings.

Conclusions: The potential uptake of the different financial incentives varied between 37.9% and 58.8%. The value of the incentive does not significantly influence the potential uptake. However,, the potential uptake and associated potential effect of the financial incentive is influenced by the type of financial incentive. The preferred type of incentive is €100 in cash money, awarded after completing the lifestyle program if the participant attended at least 75% of the scheduled meetings.

Keywords: Discrete choice experiment, lifestyle intervention, physical activity, financial incentive, preferences

Introduction

Physical inactivity and a poor diet contribute to the development of a range of chronic diseases and explain part of the variation in premature mortality [1, 2]. Many people do not meet the standards for physical activity levels developed by the World Health Organization and are physically inactive [2, 3]. Patients with diabetes mellitus type 2 or with coronary heart disease are groups with relatively high prevalence of physical inactivity [2].

Health care providers seek effective ways to change this unhealthy behavior. One way to do so is by offering (chronically ill) patients a lifestyle program that includes physical activity and improving eating behavior, called combined lifestyle interventions (CLIs) [4, 5]. However, participation rates in lifestyle programs vary considerably. Some programs have good participation rates, others struggle with low participation rates. For example, the participation rates of diabetes mellitus type 2 patients in lifestyle programs, mainly implemented in primary care, range from 10% to 80% and multiple studies mentioned that boosting the motivation of participants requires more attention [6-9].

Health promoting financial incentives (HPFI) might increase patients' participation rates and adherence to lifestyle programs and are increasingly implemented by public authorities and health insurance companies to promote healthy behaviors [10-13]. However, the effectiveness of financial incentives added to lifestyle programs in the health care setting for individuals is still inconclusive [14, 15]. HPFI are cash or cash-like rewards or fines, provided contingent on (non-) performance of healthy behaviors. The two main categories are positive (e.g. reward or discount) and negative (e.g. a fine or a higher contribution to the lifestyle program or health insurance premium) incentives [16]. Within these two categories, the incentive can vary on different characteristics. For example, they can vary in value, the moment that the participants receive their incentive (before the intervention or afterwards), conditions that have to be fulfilled to receive the incentive, and many more characteristics (e.g. provider of the incentive, lottery system or guaranteed reward). The incentive can be targeted at the participation rate, at compliance with instructions, or at outcome measures such as a higher physical activity level, a healthier diet or weight loss.

A financial incentive is an extrinsic motivation. A well-known argument for not using financial incentives is the crowding-out effect. This refers to the mechanism that extrinsic motivation in the form of financial incentives might undermine and replace the intrinsic motivation. However, in the field of health related behavior, so far no evidence has been found to support this possibility [17, 18]. A plausible explanation is that individuals eligible for a CLI do not have any intrinsic motivation to change their health behavior. Therefore, intrinsic motivation cannot be replaced by extrinsic motivation. By adding an extrinsic motivation to start participating in a CLI, participants may develop intrinsic motivation during the course of the program, for example because they develop a better physical condition.

To prevent the implementation of an ineffective or even counterproductive HPFI, insight into the preferences of the target population with regard to the HPFI is of crucial importance. To date, in the design phase of a new intervention that includes a financial incentive, hardly any research (if any) has been performed into the target populations' preferences regarding the characteristics of the financial incentive. Previous studies do however provide some general information about preferences regarding incentives. For example, the study by Gneezy et al. shows that if a financial incentive is not high enough, it might justify or even promote undesirable behavior [19]. The study by Barte et al. shows that there is a need for more insight into the effectiveness of the different types and components of a financial incentive and that for example unconditional financial incentives do not affect physical activity [20].
One way to determine preferences with regard to HPFI is by performing a Discrete Choice Experiment (DCE). This is a quantitative technique and a frequently used tool in (public) health research to estimate possible participation rates in interventions or medical treatments and to provide knowledge on the components of the programs that determine the participation rates [21, 22]. The DCE methodology is based on the Random Utility Theory and assumes that any intervention or treatment can be described by its characteristics (i.e. attributes, such as the form of the incentive). In this study, a discrete choice experiment is performed to identify which financial incentive is preferred by diabetes mellitus type 2 patients to be added to a specific lifestyle intervention that aims to improve the participant's physical activity level and eating habits.

Material and Methods

This study does not fall under the scope of the Dutch Medical Research Involving Human Subjects Act (in Dutch; WMO) and therefore did not need to undergo a review by a Medical Ethical Committee. Since an Institutional Review Board (IRB) approval is only needed when daily life of participants is influenced or participants should perform specific actions an IRB approval was not warranted and therefore not obtained. The data were anonymized prior to the moment that the authors received the data. The authors did not have access to any identifying information. This DCE was conducted as preparatory part of an intervention study aimed at evaluating the efficacy and feasibility of a financial incentive added to a lifestyle intervention. The results of this experiment were used to design the financial incentive that was added to a lifestyle intervention. The lifestyle intervention aimed to improve the participants' physical activity behavior and eating habits. This lifestyle intervention was designed for patients at least 18 years of age, with diabetes mellitus type 2 and/or cardiovascular disease, who received integrated care in the primary care setting in the region of a care group in the southern part of the Netherlands. In this section, the methods of the DCE are described.

Study population

The study population for the DCE was part of the study population of the main project and was selected based on a geographic area. The area of the care group was divided into four parts. Three subareas were selected for the intervention study in which the CLI and a financial incentive would be implemented. One subarea was excluded from the intervention study and the patients living in this area were invited to fill out the questionnaire. All selected patients were at least 18 years of age, with diabetes mellitus type 2 and/or cardiovascular disease who receive integrated care in the primary care setting for their diseases. They received the DCE questionnaire by conventional mail, with a reminder sent two weeks after the first mailing. As respondents completed their questionnaire anonymously, no information about non-responders is available.

Discrete Choice Experiment

The attributes and levels included in the current study (Table 1) were determined in a stepwise manner. First, a list of characteristics of financial incentives was compiled, based on available research literature [11, 23]. This list was discussed in three focus group interviews (eleven participants in total) to ensure that the most important attributes for the decision-making process were included. The focus groups consisted of patients with diabetes mellitus type 2 and/or cardiovascular disease. Since no new attributes were mentioned during the focus groups, the existing list of potential attributes was sent to a new subsample of patients in a different geographical location in the northern part of the Netherlands. We believe the patients of this subsample are comparable to patients in our study as patients in all Dutch care groups receive similar diabetes care, based on Dutch general practitioners' guidelines. These patients were asked to rank the attributes from most to least important. In total, 30 individuals filled out the ranking forms, of which eleven had participated in the focus group interviews. This process led to the inclusion of four attributes of which one had three levels (moment), two had four levels (form and value) and one had five levels (prerequisite). The levels were chosen based on the feasibility in practice. See Table 1 for the levels and attributes that were included in this DCE.

Table 1. Attributes and levels that were included in this DCE

Attribute	Level
Form of the incentive	– Cash money (reference level) – Voucher exchangeable in numerous stores – Voucher exchangeable in numerous restaurants – Voucher for theater- or concert tickets
Value of the incentive	– 15 euros – 35 euros – 65 euros – 100 euros
Moment incentive is received	– At the start of the lifestyle program (reference level) – After finishing the lifestyle program – Halfway (50%) and after finishing (50%) the lifestyle program
Prerequisite for receiving the incentive	– Registration for the lifestyle program (reference level) – 75% attendance at individual level – 75% attendance at group level – Individual result of the fitness test* (you will receive the reward if you have a better score at the end of the program than at the start of the program on the fitness test) – Group result of the fitness test* (you receive the reward if at least 80% (8 out of 10) participants score better at the end of the program than at the start of the fitness test.)

*The fitness test includes measuring Body Mass Index, body fat percentage, waist circumference, maximum hand grip strength, maximum leg press and VO_2^{max}.

Study design

A full factorial design with the identified attributes and levels as described in Table 1 would test all possible combinations of attributes and levels and would therefore consist of 240 (3*4*4*5) different scenarios. Due to obvious methodological (bias) and cognitive (burden on participants) reasons, not all these scenarios were included.

After pilot testing our original orthogonal DCE design, NGene 1.0 (ChoiceMetrics, 2011) software was used to develop a D-efficient design, which entails a design with an optimal variance-covariance matrix [24, 25]. The design was restricted because not all combinations of attribute levels are possible in real life. For example, when the reward is given at the start of the intervention the only requirement that can be met is registration for the lifestyle program. Our final design consisted of 18 unique choice tasks. To limit the burden for the respondents, NGene divided these 18 choice tasks into two sets of nine choice tasks and each set was disseminated among half of the study population.

Questionnaire

The questionnaire consisted of two parts. In the first section the participant had to fill out 29 questions about age, gender, socioeconomic status, nationality, physical activity level, eating habits, quality of life (EQ-5D questionnaire; score between 0 and 1www.euroqol.org), health literacy [26, 27], and attitude towards lifestyle programs. The second part of the questionnaire consisted of the actual DCE. Every respondent was presented a series of choice tasks. These choice tasks consisted of two different financial incentives described by means of varying levels of the included four attributes (Table 1). In the questionnaire, definitions for all attributes were specified. Every choice task started with the question: *'Imagine that your physician recommends that you participate in the lifestyle program as described above. Which financial incentive would motivate you most to participate in the lifestyle program and to complete it?'* An example of a choice task is shown in Figure 1.

Imagine that your physician recommends you to participate in the lifestyle program as described above. Which financial incentive would motivate you most to participate in the lifestyle program and to complete it?		***Financial incentive A***	***Financial incentive B***
	Form	Cash money	Gift voucher
	Value	100	65
	Moment	After finishing the intervention	After finishing the intervention
	Prerequisite	Group result fitness test	Individual result fitness test
		☐	☐

If this incentive is offered to you in real-life in combination with a lifestyle program, would it motivate you to participate in the lifestyle program and to complete it?

☐ Yes, the chosen financial incentive would motivate me to participate in the lifestyle program and to complete it, if this was offered to me in real-life.

☐ No, the chosen financial incentive would not motivate me to participate in the lifestyle program and to complete it, if this was offered to me in real-life.

Figure 1. Example of a choice task

Following each of the nine choice tasks, the participant was asked whether the financial incentive of their choice would actually motivate them to participate in and finish the lifestyle program or not (opt-out question). This option was included, because in real life people also have the option not to participate in the program. After completing the nine choice tasks, patients had to fill out six questions about their attitude and opinion regarding financial incentives. Response options were the characteristics of financial incentives in the choice tasks. Questions were asked about their opinion about using financial incentives, whether they believe it could motivate them or other people to work on their health, which attribute is most important in their choice for accepting or declining a financial incentive, and which form and prerequisites they prefer most.

The questionnaire was pilot tested in the development phase to make sure the target group was able to fill out the questionnaire as intended. Respondents of the pilot questionnaire

(n=30) were able to give comments on the choice of words, the length of the questionnaire and the layout, of the final questionnaire. The respondents did not report any lack of clarity, so we did not change the text of the questionnaire.

Statistical analysis

Direct attribute ranking

Before respondents answered the choice tasks, they were asked by means of a multiple-choice question which characteristic (i.e. attribute) of a financial incentive they found most important when choosing to accept or decline a financial incentive. The results of this question are reported as percentages of the respondents who rank a certain attribute as most important.

Preferences with regard to the incentive

To estimate the preferences of the target population with regard to a financial incentive, data was analyzed using panel-mixed-logit (Panel-MIXL) models. These models adjust the results for the multilevel structure of the data; every respondent completed nine choice tasks, therefore their answers may be correlated, which is accounted for using these analytical models. The following equation was tested using these models:

$$U = V + \varepsilon = \beta_0 + \beta_1 * \text{voucher exchangeable in multiple stores} + \beta_2 * \text{voucher exchangeable in multiple restaurants} + \beta_3 * \text{voucher for theater- or concert tickets} + \beta_4 * \text{value} + \beta_5 * \text{after the lifestyle program} + \beta_6 * \text{halfway (50\%) and after completing (50\%) the lifestyle program} + \beta_7 * \text{75\% attendance at individual level} + \beta_8 * \text{75\% attendance at group level} + \beta_9 * \text{individual result fitness test} + \beta_{10} * \text{group result fitness test} + \varepsilon$$

V describes the measurable utility of a specific financial incentive based on the attributes that were included in the DCE. β_0 represents the alternative specific constant and $\beta_{1-}\beta_{10}$ are the attribute level estimates that indicate the relative importance of each attribute. The opt-out option was modelled as having a utility of zero. Finally, ε describes the unmeasured and unmeasurable variation in the respondents' preferences.

All non-linear variables are coded using effects coding. In contrast to dummy coding, the reference category is coded as -1. The coefficient for the reference category is therefore -1*(sum of the β of the other attribute levels within the same attribute).

Based on the results of the model fit tests (Log Likelihood ratio test and AIC), all attributes were included as random parameters with a normally distributed standard deviation. By doing this, the model accounts for the heterogeneity in respondents' preferences concerning those attributes.

Relative importance scores of the attributes

The relative importance scores of the attributes represent the relative distance of all attributes to the most important attribute on a scale of 0-1. Since the coding of the data influences the estimates of the model, a new model was used to calculate the relative importance scores, in which all attribute levels have been coded similarly (-1 to 1).

The attribute with the highest relative importance score is most decisive in the choice for a financial incentive. To calculate these relative importance scores, first the difference between the largest and the smallest attribute level estimate had to be calculated for each attribute. An importance score of 1 was given to the attribute with the largest difference value. The other relative importance scores were calculated by dividing the difference values by the largest difference value, resulting in a relative distance of all attributes to the most important attribute.

Potential uptake of different incentives

The potential uptake of a financial incentive that consists of a specific set of attributes was estimated. Since all attributes were included as random parameters in the analyses and their standard deviation had to be taken into account, simulation was used to calculate the choice probabilities. The mean participation rates of all simulations (n=10,000) was estimated by taking the average of all simulated participation rate probabilities, which were calculated as $1/(1+\exp^{-v})$.

Results

Participant characteristics

The questionnaire was sent to 971 individuals and 290 questionnaires were returned in total (response rate of 29.9%). The mean age of the respondents was 69.4 years (range 38 to 92 years) and 60.4% were male. About half of the participants had a low educational level. Participants scored their health-related quality of life (EQ-5D) on average with a score of 0.84 for men and 0.79 for women (overall score of 0.82), while 12.2% of the respondents had an inadequate health literacy (score ≤ 2; self-reported). Almost a quarter of the participants believed that using financial incentives to motivate people to improve their health would be useful and 42.7% considered it not useful. In total, 16.9% of the respondents reported that a financial incentive would personally motivate them to improve their health while 64.2% reported that it would not motivate them (**Table 2**).

Table 2. General characteristics of the study population (N=290)

	Mean (SD)	Percentage

Age (n=279)	69.4 (9.9)	
Gender (n=283)		
Male		60.4
Ethnicity (n=290)		
Dutch		96.2
Educational level (n=285)		
Low		54.4
Medium		19.1
High		20.9
Other		5.5
Household income per month (n=260)		
Less than €1000		8.5
€1000 to €2000		33.5
€2000 to €3000		28.5
€3000 to €4000		16.2
€4000 to €5000		8.5
€5000 or more		5.0
Health-related quality of life (EQ5d score)		
Overall (n=275)	0.82 (0.17)	
Men (n=167)	0.85 (0.14)	
Women (n=108)	0.79 (0.19)	
Health literacy		
Health literacy score (range 0-4) (n=287)	3.4 (0.88)	12.2
Inadequate health literacy (n=287)		
Opinion on financial incentives to improve people's health status (n=253)		
Very useful / Useful		24.1
Neutral		33.2
Not very useful / Not useful at all		42.7
Respondents' opinion whether a financial incentive would motivate them to improve their health (n=254)		
Yes, it would motivate me		16.9
No, it would not motivate me		64.2
No opinion		18.9

Direct attribute ranking

Most of the respondents (52.5%) reported that the prerequisites for receiving the incentive were the most important attribute for them, followed by the form of the incentive (22.1%) and the value of the incentive (14.9%). Finally, the smallest number of respondents (10.5%) marked the moment of awarding the incentive as the most important attribute (Figure 2).

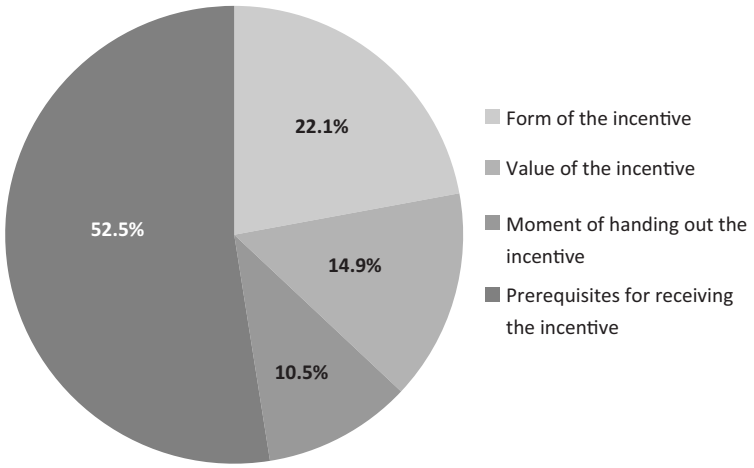


Figure 2. Direct attribute ranking

Preferences with regard to the incentive

Respondents preferred cash money over all other forms of incentives, while a voucher for theater or concert tickets was the least preferred. The higher the value of the incentive, the more individuals preferred the incentive. Respondents preferred to receive the incentive after completing the lifestyle program over receiving it at any other point in time. Finally, respondents preferred the prerequisite of 75% attendance at individual level over all other prerequisites. The least preferred prerequisite for receiving the incentive was the group result of the fitness test (Table 3).

Table 3. Preferences for a financial incentive

		Estimate	SE
Constant	Mean	-0.603	0.252
	SD	3.712	0.265
Form of the incentive			
Cash money (reference)	Mean	0.173	0.098
	SD	0.525	0.136
Voucher exchangeable in numerous stores	Mean	0.052	0.080
	SD	0.058	0.327
Voucher exchangeable in numerous restaurants	Mean	0.143	0.085
	SD	0.228	0.135
Voucher for theater or concert tickets	Mean	-0.368	0.102
	SD	0.470	0.131
Value of the incentive	Mean	0.243	0.213
	SD	1.248	0.286
Moment the incentive is received			
At the start of the lifestyle program (reference)	Mean	-0.356	0.047
	SD	0.343	0.127
After completing the lifestyle program	Mean	0.522	0.088
	SD	0.331	0.124
Halfway (50%) and after completing the lifestyle program (50%)	Mean	-0.166	0.118
	SD	0.090	0.154
Prerequisite for receiving the incentive			
Registration for the lifestyle program (reference)	Mean	0.006	1.067
	SD	0.644	0.165
75% attendance at individual level	Mean	0.608	0.106
	SD	0.008	0.169
75% attendance at group level	Mean	-0.103	0.110
	SD	0.111	0.144
Individual result of the fitness test	Mean	0.225	0.118
	SD	0.124	0.196
Group result of the fitness test	Mean	-0.736	0.150
	SD	0.622	0.164

Relative importance scores of the attributes

Respondents reported that a prerequisite for receiving the incentive was the most important attribute (score 1.00). The moment of receiving the incentive was about half as important (0.52) and the value of the incentive has the lowest relative importance score. Figure 3 shows the results in more detail.

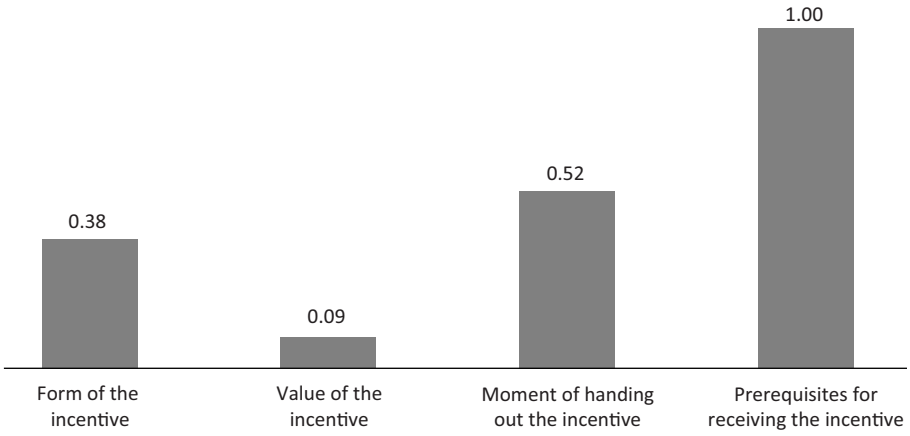


Figure 3. Relative importance scores of the attributes included in the DCE.

Potential uptake of different incentives

Potential uptake rates varied strongly, ranging from 37.9% to 58.8%, based on the characteristics of the incentive. The financial incentive with the highest potential uptake (58.8%) was cash money with a value of €100 that is handed out afterwards with the requirement that the individual has attended at least 75% of the appointments (Table 4). The incentive with the lowest potential uptake (37.9%) was a voucher for theater or concert tickets of €15 that is handed out at the start with no requirements besides registration for the lifestyle program (Table 4).

Table 4. Potential uptake in percentages of all possible financial incentives (lowest and highest potential uptake rates in bold)

	Cash	Voucher exchangeable in multiple stores	Voucher exchangeable in multiple restaurants	Voucher theater or concert tickets
15 euros				
At the start + registration lifestyle program	43.1	41.8	42.9	**37.9**
Halfway and after completing the program + 75% attendance individual level	50.5	49.1	50.3	44.8
Halfway and after completing the program + 75% attendance group level	43.7	42.3	43.3	38.6
After completing the program + 75% attendance individual level	57.6	55.7	56.6	51.9
After completing the program + 75% attendance group level	50.5	49.1	50.2	45.0
After completing the program + individual result fitness test	53.5	51.9	53.2	48.6
After completing the program + group result fitness test	44.3	43.7	44.1	39.2
35 euros				
At the start + registration lifestyle program	43.8	42.3	43.6	38.5
Halfway and after completing the program + 75% attendance individual level	51.1	49.9	50.7	45.6
Halfway and after completing the program + 75% attendance group level	44.7	43.1	43.5	39.0
After completing the program + 75% attendance individual level	57.8	56.4	57.4	52.0
After completing the program + 75% attendance group level	50.6	49.8	50.5	45.3
After completing the program + individual result fitness test	53.7	52.8	53.7	48.7
After completing the program + group result fitness test	44.7	43.4	44.2	39.9
65 euros				
At the start + registration lifestyle program	44.3	43.1	44.0	39.5
Halfway and after completing the program + 75% attendance individual level	51.7	50.3	51.5	46.4
Halfway and after completing the program + 75% attendance group level	45.1	44.1	44.7	40.0
After completing the program + 75% attendance individual level	58.0	57.1	57.6	53.2

	Cash	Voucher exchangeable in multiple stores	Voucher exchangeable in multiple restaurants	Voucher theater or concert tickets
After completing the program + 75% attendance group level	51.1	50.1	51.0	46.1
After completing the program + individual result fitness test	54.6	53.4	54.4	49.0
After completing the program + group result fitness test	45.4	44.2	45.5	40.4
100 euros				
At the start + registration lifestyle program	45.4	44.1	44.9	40.0
Halfway and after completing the program + 75% attendance individual level	52.5	51.2	52.2	47.5
Halfway and after completing the program + 75% attendance group level	45.8	44.7	45.2	40.7
After completing the program + 75% attendance individual level	**58.8**	57.4	58.2	53.7
After completing the program + 75% attendance group level	52.4	51.0	52.2	48.6
After completing the program + individual result fitness test	55.1	54.2	54.9	50.5
After completing the program + group result fitness test	46.7	45.2	46.1	41.8

Discussion

We performed a discrete choice experiment to identify which financial incentive should preferably be added to a combined lifestyle intervention among patients with diabetes type 2. This study is, to our knowledge, the first to investigate preferences for a financial incentive added to a lifestyle program.

The most preferred financial incentive resulting in the highest potential uptake based on this DCE was cash money with a value of €100, handed out after completing the lifestyle program with the prerequisite that the participant had attended at least 75% of the appointments. The prerequisite for receiving the financial incentive was the most important attribute when patients had to decide whether or not to participate in a lifestyle program with an incentive, while the monetary value of the incentive had the lowest relative importance score.

The range of the potential uptake of all incentives was between 37.9% and 58.8%. This range is not very wide, taking into account the great variety of financial incentives that were examined in this study. Still, these differences in potential uptake do matter in practice, which makes

this study relevant. It is a noticeable finding that the easiest requirement (registering for the lifestyle program and receiving the incentive at the start of the program) showed quite low potential uptake percentages (range between 37.9% and 45.4%). The study by Wanders et al. describes differences in effect size between out-of-pocket costs and financial rewards on the willingness to participate in a lifestyle program. In contrast to the results of our study, the study by Wanders et al. showed that a reward with a higher value is not always preferred [28], and that individuals may be offended by the high values of the incentive that were offered. In our study we used lower values for the incentive than the cut-off point of the study by Wanders et al., since a higher value than €100 was not feasible with a view to implementing the incentive in practice. Overall, the value did not have much impact on the potential uptake of the incentive (Table 3 & Table 4).
Sixty-two percent of the respondents have a household income between €1000 and €3000 per month. According to the OECD, the average household income in the Netherlands is about €2100 a month [29]. The average age of the respondents is 69.4 years, implying that most people are retired and entitled to a state pension and possibly to a supplementary pension scheme. In this group, it was found that the value of the financial incentive does not influence the potential uptake to a large extent. We hypothesize that retired individuals might not have very high costs, such as growing children or a mortgage, and may not need the money. The prerequisite for the financial incentive might be a more important determinant of their choice, because receiving the incentive and appreciating the reward is more justifiable if they have accomplished something.

Our target population consisted of patients with diabetes type 2 and/or cardiovascular disease. The average age was almost 70 years and half of the study population had a low level of education. In our study, 12.2% of the respondents had a low health literacy level. According to a report of the HLS-EU Consortium, about 29% of the Dutch population has an inadequate or problematic health literacy [30]. This relatively low percentage of individuals with low health literacy might be the result of selective response, since individuals with low health literacy might also not understand the questionnaire and therefore not respond. Completing a DCE is quite a complex task. One strength of our study is that the questionnaire was first pilot tested on readability and intelligibility, which is recommended in order to obtain valid results [31, 32]. By doing this, we reduced the chance that participants did not understand the final questionnaire. Furthermore, to limit the burden for the participants we divided the choice sets into two blocks.
There is little knowledge with regard to the response rates for DCE questionnaires. A study by Watson et al. found that the response rate decreases as the cognitive burden of the questionnaire increases [33]. The response rate in our DCE was 29.9%, which we believe is quite good, taking into account the aforementioned characteristics of our target population

and the general complexity of the task. Overall, despite some limitations of the DCE technique, it is now the most accepted method to identify people's preferences.

Overall, 64.2% of the respondents reported that a financial incentive would not motivate them to participate in and complete the lifestyle program. We sent this questionnaire to all patients with diabetes type 2 that are registered with a regional care group. This population also includes individuals who are sufficiently active. On the one hand, there might be selective non-response, with these active individuals not completing the questionnaire because they do not see the point of the program. On the other hand, the individuals who are sufficiently active and did fill out the questionnaire might not be motivated by receiving a financial incentive. If the respondents are not motivated by an incentive, does not mean that the wrong attributes were chosen in this study. The attributes are characteristics of the incentive that influence the choice for willing or not willing an incentive. We have chosen our attributes with input of our target population, so the selection of attributes was evidence based. Moreover, our results show a large heterogeneity in preferences. For example, the constant show that some respondent have a strong preference for receiving an incentive, whether others have a strong preference for not receiving an incentive. A similar pattern is seen for the value of the incentive. Some people attach importance to the value of the incentive, whether others do not. Due to the sample size, we were not able to specify the analyses, but it is likely that the heterogeneity could be explained partly by the respondents who state that an incentive would not motivate them.

Although just a small amount of research has been performed on the preferences of the target population for a financial incentive, it is becoming an increasingly important research area. Financial incentives may improve the effectiveness of, for example, prevention programs. One concern is that the implementation of financial incentives might pave the way for patients to misuse the available resources [34]. This might result in negative opinions and resistance from the public towards programs that contain financial incentives. In spite of the concerns that individuals may misuse HPFI, research shows that under certain conditions a HPFI is accepted more readily by the general public. These conditions are for example that the HPFI has to be effective and cost-effective and that the HPFI is closely monitored and evaluated [34-37].
Despite the arguments above, it is still useful to perform research on the preferences for and effectiveness of financial incentives. Lifestyle interventions can support good short-term adherence (up to twelve weeks) to exercise programs for chronically ill patients, but long-term adherence (up to four years) is poor and not well documented [38]. By completing lifestyle programs that are extended enough to achieve behavioral change, the chance that individuals will keep exercising in the long term might be higher. New and creative ways have

to be found to increase the adherence of the chronically ill to lifestyle programs. Financial incentives might form one of these new instruments.

This study contributes to the knowledge of what chronically ill patients rate as more and less important with regard to financial incentives in lifestyle programs. The results of this DCE will be used in a study to evaluate the effectiveness of a financial incentive for improving the health of diabetes patients. By first identifying the preferred financial incentive, the probability that the financial incentive is effective will be maximized. In a broader perspective, this study contributes to the knowledge of preferences of individuals with regard to financial incentives.

Conclusions

Among potential participants for a specified lifestyle program for the chronically ill, the most preferred financial incentive is cash money with a value of €100 that is handed out after the lifestyle program is finished with the prerequisite that the participant has attended at least 75% of the appointments. The potential uptake of the different financial incentives included in this DCE varied from 37.9% up to 58.8%. The value of the incentive did not significantly influence the potential uptake. However, the potential uptake and associated potential effect of the financial incentive is influenced by the type of financial incentive.

Abbreviations

DCE: discrete choice experiment
HPFI: health promoting financial incentive

Acknowledgements

We would like to thank care group Syntein for their efforts in the distribution of the questionnaire.

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Vragenlijst Financiële prikkels

Toelichting bij de vragenlijst

Er wordt tegenwoordig veel aandacht besteed aan een gezond leefpatroon. Gezond leven is belangrijk om ziekten en andere gezondheidsproblemen te voorkomen. Veel mensen hebben moeite om een gezonde leefstijl vol te houden of te bepalen wat gezond voor ze is. Om mensen op weg te helpen om een gezond leefpatroon te bereiken, zijn er leefstijlprogramma's ontwikkeld. Het is gebleken dat mensen het makkelijker vinden om een leefstijlprogramma vol te houden als ze hiervoor een beloning krijgen. In deze vragenlijst wordt uw mening gevraagd over leefstijl- programma's en financiële prikkels.
In onderstaande tekstblokken staat kort uitgelegd wat we met deze twee termen bedoelen.

Leefstijlprogramma

Met een leefstijlprogramma bedoelen we activiteiten:

- die als doel hebben te werken aan uw gezondheid,
- waarin aandacht is voor zowel bewegen als voeding en
- die door professionele zorgverleners worden aangeboden.

Het programma zoals bedoeld in deze vragenlijst ziet er als volgt uit:

- Gedurende een periode van 6 weken één keer per week naar de fysiotherapeut om te bewegen.
- In ongeveer dezelfde periode 3 groepssessies en 3 individuele bezoeken aan de diëtist om advies te krijgen over gezonde voeding.
- Aan het einde van deze periode wordt samen met u gezocht naar een beweegactiviteit in de buurt die bij u past.

Financiële prikkel

Met een financiële prikkel bedoelen we een beloning met een geldelijke waarde. Zo'n financiële prikkel zou bijvoorbeeld kunnen helpen om mensen over te halen te beginnen met het verbeteren van hun leefstijl of bij het behalen van een bepaald resultaat wat vooraf is afgesproken.

De vragenlijst start met enkele algemene vragen en een aantal vragen over uw gezondheid. Daarna volgt een aantal vragen over leefstijlprogramma's en financiële prikkels. Bij sommige vragen staat extra uitleg.

We willen u vragen om bij het invullen van de vragenlijst het leefstijlprogramma in gedachten te nemen dat hierboven is beschreven.

Vult u de vragenlijst alstublieft zo volledig mogelijk in. ***U kunt overal maar één antwoord invullen, tenzij anders is aangegeven.*** Het invullen van de vragenlijst zal ongeveer 30 minuten duren. Uw gegevens zullen vertrouwelijk worden behandeld en niet aan anderen worden verstrekt. Voor de onderzoeker zullen de gegevens niet naar u terug te leiden zijn.

Voor vragen over de vragenlijst kunt u contact opnemen met Claudia Molema, onderzoeker.
E-mail: claudia.molema@rivm.nl
Telefoonnummer: 030-274 2753

1 Hieronder stellen we u enkele vragen over uw persoonlijke situatie

Vult u hier alstublieft de datum in waarop u de vragenlijst heeft ingevuld.	dag [...][...] maand [...][...] jaar [...][...][...][...]
1. Wat is uw leeftijd?	[...][...] jaar
2. Wat is uw geslacht?	☐ Man ☐ Vrouw
3. Wat is uw hoogst genoten opleiding?	☐ Lager algemeen onderwijs (basisonderwijs) ☐ Lager beroepsonderwijs (LTS, LEAO) ☐ Middelbaar algemeen onderwijs (MAVO, MULO, VMBO) ☐ Middelbaar beroepsonderwijs (MTS, MEAO, MBO) ☐ Voortgezet algemeen onderwijs (HAVO, VWO, Atheneum, Gymnasium) ☐ Hoger beroepsonderwijs (HBO, HEAO, HTS) ☐ Wetenschappelijk onderwijs ☐ Anders, namelijk [.....]
4. Wat is het gemiddelde bruto inkomen van uw huishouden per maand?	☐ €1000 of minder ☐ €1000 tot €2000 ☐ €2000 tot €3000 ☐ €3000 tot €4000 ☐ €4000 tot €5000 ☐ €5000 of meer
5. Wat is uw burgerlijke status?	☐ Alleenstaand ☐ Samenwonend ☐ Gehuwd
6. Uit hoeveel personen bestaat uw huishouden op dit moment?	☐ 1 persoon ☐ 2 personen ☐ 3–4 personen ☐ 5 of meer personen
7. Wat is uw geboorteland?	☐ Nederland ☐ Suriname ☐ Nederlandse Antillen ☐ Aruba ☐ Turkije ☐ Marokko ☐ Overig, namelijk [.....]

8. Wat is het geboorteland van uw moeder?
   - ☐ Nederland
   - ☐ Suriname
   - ☐ Nederlandse Antillen
   - ☐ Aruba
   - ☐ Turkije
   - ☐ Marokko
   - ☐ Overig, namelijk [.....]

9. Wat is het geboorteland van uw vader?
   - ☐ Nederland
   - ☐ Suriname
   - ☐ Nederlandse Antillen
   - ☐ Aruba
   - ☐ Turkije
   - ☐ Marokko
   - ☐ Overig, namelijk [.....]

10. Tot welke bevolkingsgroep rekent u zichzelf?
    Er is slechts één antwoord mogelijk.
    - ☐ Nederland
    - ☐ Suriname
    - ☐ Nederlandse Antillen
    - ☐ Aruba
    - ☐ Turkije
    - ☐ Marokko
    - ☐ Overig, namelijk [.....]

11. Hoeveel dagen fietst en/of wandelt u gemiddeld per week?
    (hier valt zowel fietsen en wandelen in uw vrije tijd onder, maar ook fietsen of wandelen naar bijvoorbeeld uw werk of de supermarkt)
    - ☐ 0 dagen
    - ☐ 1 dag
    - ☐ 2 dagen
    - ☐ 3 dagen
    - ☐ 4 dagen
    - ☐ 5 dagen
    - ☐ 6 dagen
    - ☐ 7 dagen

12. Hoeveel tijd besteedt u hier gemiddeld per dag aan?
    Heeft u bij vraag 11 als antwoord '0 dagen' gegeven, dan kunt u deze vraag overslaan.
    - ☐ Minder dan 15 minuten per dag
    - ☐ 15–30 minuten per dag
    - ☐ 30–60 minuten per dag
    - ☐ Meer dan 60 minuten per dag

13. Doet u aan sport?
    (wandelen en fietsen worden hier niet meegerekend)
    - ☐ Nee, ik doe niet aan sport.
    - ☐ Ja, ik sport, maar minder dan 1 keer per week
    - ☐ Ja, ik sport 1–2 keer per week
    - ☐ Ja, ik sport 3 keer per week of vaker

14. Hoeveel tijd besteedt u gemiddeld per keer aan het sporten?
    Heeft u bij vraag 13 als antwoord 'Nee, ik doe niet aan sport' gegeven, dan kunt u deze vraag overslaan.
    - ☐ Minder dan 15 minuten per keer
    - ☐ 15–30 minuten per keer
    - ☐ 30–60 minuten per keer
    - ☐ Meer dan 60 minuten per keer

15. Heeft u in de afgelopen 3 maanden iets veranderd aan hoeveel u beweegt?
- ☐ Ja, ik ben meer gaan bewegen
- ☐ Ja, ik ben minder gaan bewegen
- ☐ Nee, er is niets veranderd

16. Hoeveel groente en fruit eet u gemiddeld per dag?

Fruit:
- ☐ 1 stuk of minder per dag
- ☐ 2 stuks per dag
- ☐ 3 stuks per dag
- ☐ 4 stuks of meer per dag

Groente:
- ☐ 1 opscheplepel of minder per dag
- ☐ 2 opscheplepels per dag
- ☐ 3 opscheplepels per dag
- ☐ 4 opscheplepels of meer per dag

17. Heeft u in de afgelopen 3 maanden iets veranderd aan hoeveel groente en fruit u eet?
- ☐ Ja, ik ben meer groente en/of fruit gaan eten
- ☐ Ja ik ben minder groente en/of fruit gaan eten
- ☐ Nee, er is niets veranderd

18. Wat vindt u in het algemeen van uw eigen gezondheid?
- ☐ Zeer goed
- ☐ Goed
- ☐ Gaat wel
- ☐ Slecht
- ☐ Zeer slecht

> Wilt u hieronder steeds het antwoord aankruisen dat het best past bij u <u>vandaag</u>?

19. Mobiliteit
- ☐ Ik heb geen problemen met lopen
- ☐ Ik heb een beetje problemen met lopen
- ☐ Ik heb matige problemen met lopen
- ☐ Ik heb ernstige problemen met lopen
- ☐ Ik ben niet in staat om te lopen

20. Zelfzorg
- ☐ Ik heb geen problemen met mijzelf wassen of aankleden
- ☐ Ik heb een beetje problemen met mijzelf wassen of aankleden
- ☐ Ik heb matige problemen met mijzelf wassen of aankleden
- ☐ Ik heb ernstige problemen met mijzelf wassen of aankleden
- ☐ Ik ben niet in staat mijzelf te wassen of aan te kleden

21. Dagelijkse activiteiten *(bijv. werk, studie, huishouden, gezins- en vrijetijdsactiviteiten)*
- ☐ Ik heb geen problemen met mijn dagelijkse activiteiten
- ☐ Ik heb een beetje problemen met mijn dagelijkse activiteiten
- ☐ Ik heb matige problemen met mijn dagelijkse activiteiten
- ☐ Ik heb ernstige problemen met mijn dagelijkse activiteiten
- ☐ Ik ben niet in staat mijn dagelijkse activiteiten uit te voeren

22. Pijn/ongemak
- ☐ Ik heb geen pijn of ongemak
- ☐ Ik heb een beetje pijn of ongemak
- ☐ Ik heb matige pijn of ongemak
- ☐ Ik heb ernstige pijn of ongemak
- ☐ Ik heb extreme pijn of ongemak

23. Angst/somberheid
- ☐ Ik ben niet angstig of somber
- ☐ Ik ben een beetje angstig of somber
- ☐ Ik ben matig angstig of somber
- ☐ Ik ben erg angstig of somber
- ☐ Ik ben extreem angstig of somber

> Informatie over gezondheid, ziekten of behandelingen kan soms ingewikkeld zijn. Wij zijn benieuwd naar uw ervaringen hiermee.

24. Hoe vaak helpt iemand u met het lezen van brieven of folders van uw huisarts of het ziekenhuis?
- ☐ Nooit
- ☐ Af en toe
- ☐ Soms
- ☐ Vaak
- ☐ Altijd

25. Hoe zeker bent u ervan dat u medische formulieren zelf goed invult?
- ☐ Heel erg
- ☐ Nogal
- ☐ Een beetje
- ☐ Een klein beetje
- ☐ Helemaal niet

26. Hoe vaak is het moeilijk voor u om meer te weten te komen over uw gezondheid, omdat u geschreven informatie niet goed begrijpt?
- ☐ Nooit
- ☐ Af en toe
- ☐ Soms
- ☐ Vaak
- ☐ Altijd

> Hieronder volgen nog enkele vragen over uw ervaringen met en mening over leefstijlprogramma's.

27. Heeft u ooit eerder aan een leefstijlprogramma mee gedaan?
- ☐ Ja, een leefstijlprogramma over voeding en/of bewegen
- ☐ Ja, een leefstijlprogramma met een ander onderwerp dan voeding en/of bewegen
- ☐ Nee
- ☐ Weet ik niet

28. Wat is uw mening over een leefstijlprogramma in het algemeen?
- ☐ Zeer nuttig
- ☐ Nuttig
- ☐ Neutraal
- ☐ Niet zo nuttig
- ☐ Helemaal niet nuttig

29. Zou u zelf graag (nog een keer) mee willen doen aan een leefstijlprogramma over voeding en/of bewegen
- ☐ Zeker wel
- ☐ Waarschijnlijk wel
- ☐ Weet ik niet
- ☐ Misschien
- ☐ Zeker niet

2 Aan welke financiële prikkel geeft u de voorkeur?

In dit onderdeel van de vragenlijst leggen we u telkens een keuze voor tussen 2 situaties. In totaal leggen we u 9 keuzes voor. Het is de bedoeling dat u telkens de situatie kiest die u in het echte leven ook zou kiezen. In de eerste kolom staat steeds hetzelfde, in de twee kolommen ernaast vindt u kleine verschillen over de kenmerken van de financiële prikkel.
Hieronder wordt uitleg gegeven over de termen die we gebruiken in dit deel van de vragenlijst. Daarna volgt een voorbeeld van een keuze.

> Het is belangrijk dat u dit eerst goed leest voordat u verder gaat met het invullen van de vragenlijst.

Vorm: De beloning kan in meerdere vormen worden uitgereikt:
- *Contant geld*
- *VVV bon:* deze kunt u bij vrijwel alle grotere winkels inleveren.
- *Dinercheque:* deze kunt u bij deelnemende restaurants inleveren.
- *Theater- en concertbon:* hier kunt u kaartjes voor een theatershow of concert mee betalen.

Hoogte: De beloning kan verschillende hoogten hebben. Het genoemde bedrag is het totaalbedrag, dus als u op meerdere momenten een beloning krijgt, dan is dat steeds een deel van het totaalbedrag:
- 15 euro
- 35 euro
- 65 euro
- 100 euro

Moment: De beloning kan op verschillende momenten worden uitgereikt;
- *Vooraf: u krijgt de beloning bij de start van het leefstijlprogramma*
- *Achteraf: u krijgt de beloning na afloop van het leefstijlprogramma*
- *Halverwege en achteraf: u krijgt halverwege het leefstijlprogramma de helft van de beloning*
- *en na afloop van het programma de andere helft.*

Eisen: er kunnen eisen gesteld worden aan het krijgen van de beloning. Wanneer niet wordt voldaan aan de gestelde eis, dan zult u geen beloning ontvangen.

- *Inschrijven voor leefstijlprogramma individu: als u zich inschrijft voor het programma, dan krijgt u de beloning.*
- *75% aanwezigheid individu: u moet zelf minimaal 75% van de bijeenkomsten deelgenomen hebben (dus minimaal 9 van de 12 bijeenkomsten met de fysiotherapeut en de diëtist).*
- *75% aanwezigheid groep: de gehele groep moet minimaal 75% van de bijeenkomsten deelgenomen hebben (dus minimaal 9 van de 12 bijeenkomsten met de fysiotherapeut en de diëtist).*
- *Prestatie fitheidstest individu: u ontvangt de beloning als u aan het einde van het programma een betere score hebt dan aan het begin van het programma op de fitheidstest. Een fitheidstest meet uw kracht en conditie.*
- *Prestatie fitheidstest groep: u ontvangt de beloning als tenminste 80% (8 van de 10) deelnemers aan het einde van het programma beter scoren dan bij het begin op de fitheidstest. Een fitheidstest meet uw kracht en conditie.*

30. Welke van de op de vorige pagina beschreven kenmerken is voor u het meest belangrijk in de keuze voor een financiële prikkel?
    - ☐ Vorm van de financiële prikkel
    - ☐ Hoogte van de financiële prikkel
    - ☐ Moment waarop de financiële prikkel wordt uitgereikt aan u
    - ☐ Eisen welke er gesteld worden voordat u de financiële prikkel krijgt

31. Welke van de op de vorige pagina beschreven kenmerken is voor u het minst belangrijk in de keuze voor een financiële prikkel?
    - ☐ Vorm van de financiële prikkel
    - ☐ Hoogte van de financiële prikkel
    - ☐ Moment waarop de financiële prikkel wordt uitgereikt aan u
    - ☐ Eisen welke er gesteld worden voordat u de financiële prikkel krijgt

Keuze 1 Stelt u zich voor dat uw huisarts u aanraadt om deel te nemen aan het leefstijlprogramma dat is beschreven op de eerste pagina van de vragenlijst. Welke financiële prikkel zou u dan het meeste motiveren om aan het leefstijlprogramma deel te nemen EN deze af te maken?		**Financiële prikkel A**	**Financiële prikkel B**
	Vorm	Contant geld	VVV bon
	Hoogte	100	65
	Moment	Achteraf	Achteraf
	Eisen	Groepsprestatie fitheidstest	Individuele prestatie fitheidstest
		☐	☐

Als u in werkelijkheid deze prikkel aangeboden krijgt bij een leefstijlprogramma, zou dit u dan motiveren om aan het leefstijlprogramma deel te nemen en deze ook af te maken?

☐ Ja, de door mij gekozen financiële prikkel zou mij wel motiveren om deel te nemen aan het leefstijlprogramma en deze ook af te maken als deze mij in werkelijkheid wordt aangeboden.

☐ Nee, de door mij gekozen financiële prikkel zou mij niet motiveren om deel te nemen aan het leefstijlprogramma en ook niet om het programma af te maken als deze mij in werkelijkheid wordt aangeboden

Keuze 2 Stelt u zich voor dat uw huisarts u aanraadt om deel te nemen aan het leefstijlprogramma dat is beschreven op de eerste pagina van de vragenlijst. Welke financiële prikkel zou u dan het meeste motiveren om aan het leefstijlprogramma deel te nemen EN deze af te maken?		**Financiële prikkel A**	**Financiële prikkel B**
	Vorm	Dinercheque	Contant geld
	Hoogte	65	15
	Moment	Vooraf	Achteraf
	Eisen	Inschrijven leefstijl-programma	Individuele prestatie fitheidstest
		☐	☐

Als u in werkelijkheid deze prikkel aangeboden krijgt bij een leefstijlprogramma, zou dit u dan motiveren om aan het leefstijlprogramma deel te nemen en deze ook af te maken?

☐ Ja, de door mij gekozen financiële prikkel zou mij wel motiveren om deel te nemen aan het leefstijlprogramma en deze ook af te maken als deze mij in werkelijkheid wordt aangeboden.

☐ Nee, de door mij gekozen financiële prikkel zou mij niet motiveren om deel te nemen aan het leefstijlprogramma en ook niet om het programma af te maken als deze mij in werkelijkheid wordt aangeboden.

Keuze 3		**Financiële prikkel A**	**Financiële prikkel B**
Stelt u zich voor dat uw huisarts u aanraadt om deel te nemen aan het leefstijlprogramma dat is beschreven op de eerste pagina van de vragenlijst. Welke financiële prikkel zou u dan het meeste motiveren om aan het leefstijlprogramma deel te nemen EN deze af te maken?	**Vorm**	Dinercheque	Theater- en concertbon
	Hoogte	100	35
	Moment	Achteraf	Vooraf
	Eisen	Individuele prestatie fitheidstest	Inschrijven leefstijlprogramma
		☐	☐

Als u in werkelijkheid deze prikkel aangeboden krijgt bij een leefstijlprogramma, zou dit u dan motiveren om aan het leefstijlprogramma deel te nemen en deze ook af te maken?

☐ Ja, de door mij gekozen financiële prikkel zou mij wel motiveren om deel te nemen aan het leefstijlprogramma en deze ook af te maken als deze mij in werkelijkheid wordt aangeboden.

☐ Nee, de door mij gekozen financiële prikkel zou mij niet motiveren om deel te nemen aan het leefstijlprogramma en ook niet om het programma af te maken als deze mij in werkelijkheid wordt aangeboden.

Keuze 4		**Financiële prikkel A**	**Financiële prikkel B**
Stelt u zich voor dat uw huisarts u aanraadt om deel te nemen aan het leefstijlprogramma dat is beschreven op de eerste pagina van de vragenlijst. Welke financiële prikkel zou u dan het meeste motiveren om aan het leefstijlprogramma deel te nemen EN deze af te maken?	**Vorm**	Contant geld	VVV bon
	Hoogte	15	15
	Moment	Achteraf	Halverwege en achteraf
	Eisen	75% aanwezigheid individu	75% aanwezigheid groep
		☐	☐

Als u in werkelijkheid deze prikkel aangeboden krijgt bij een leefstijlprogramma, zou dit u dan motiveren om aan het leefstijlprogramma deel te nemen en deze ook af te maken?

☐ Ja, de door mij gekozen financiële prikkel zou mij wel motiveren om deel te nemen aan het leefstijlprogramma en deze ook af te maken als deze mij in werkelijkheid wordt aangeboden.

☐ Nee, de door mij gekozen financiële prikkel zou mij niet motiveren om deel te nemen aan het leefstijlprogramma en ook niet om het programma af te maken als deze mij in werkelijkheid wordt aangeboden.

Keuze 5		**Financiële prikkel A**	**Financiële prikkel B**
Stelt u zich voor dat uw huisarts u aanraadt om deel te nemen aan het leefstijlprogramma dat is beschreven op de eerste pagina van de vragenlijst. Welke financiële prikkel zou u dan het meeste motiveren om aan het leefstijlprogramma deel te nemen EN deze af te maken?	**Vorm**	Theater- en concertbon	Dinercheque
	Hoogte	65	65
	Moment	Halverwege en achteraf	Achteraf
	Eisen	75% aanwezigheid groep	Inschrijven leefstijlprogramma
		☐	☐

Als u in werkelijkheid deze prikkel aangeboden krijgt bij een leefstijlprogramma, zou dit u dan motiveren om aan het leefstijlprogramma deel te nemen en deze ook af te maken?

☐ Ja, de door mij gekozen financiële prikkel zou mij wel motiveren om deel te nemen aan het leefstijlprogramma en deze ook af te maken als deze mij in werkelijkheid wordt aangeboden.

☐ Nee, de door mij gekozen financiële prikkel zou mij niet motiveren om deel te nemen aan het leefstijlprogramma en ook niet om het programma af te maken als deze mij in werkelijkheid wordt aangeboden.

Keuze 6		**Financiële prikkel A**	**Financiële prikkel B**
Stelt u zich voor dat uw huisarts u aanraadt om deel te nemen aan het leefstijlprogramma dat is beschreven op de eerste pagina van de vragenlijst. Welke financiële prikkel zou u dan het meeste motiveren om aan het leefstijlprogramma deel te nemen EN deze af te maken?	**Vorm**	Theater- en concertbon	VVV bon
	Hoogte	35	35
	Moment	Achteraf	Achteraf
	Eisen	Inschrijven leefstijlprogramma	75% aanwezigheid individu
		☐	☐

Als u in werkelijkheid deze prikkel aangeboden krijgt bij een leefstijlprogramma, zou dit u dan motiveren om aan het leefstijlprogramma deel te nemen en deze ook af te maken?

☐ Ja, de door mij gekozen financiële prikkel zou mij wel motiveren om deel te nemen aan het leefstijlprogramma en deze ook af te maken als deze mij in werkelijkheid wordt aangeboden.

☐ Nee, de door mij gekozen financiële prikkel zou mij niet motiveren om deel te nemen aan het leefstijlprogramma en ook niet om het programma af te maken als deze mij in werkelijkheid wordt aangeboden.

Keuze 7		**Financiële prikkel A**	**Financiële prikkel B**
Stelt u zich voor dat uw huisarts u aanraadt om deel te nemen aan het leefstijlprogramma dat is beschreven op de eerste pagina van de vragenlijst. Welke financiële prikkel zou u dan het meeste motiveren om aan het leefstijlprogramma deel te nemen EN deze af te maken?	**Vorm**	VVV bon	Dinercheque
	Hoogte	15	35
	Moment	Achteraf	Achteraf
	Eisen	Inschrijven leefstijlprogramma	Individuele prestatie fitheidstest
		☐	☐

Als u in werkelijkheid deze prikkel aangeboden krijgt bij een leefstijlprogramma, zou dit u dan motiveren om aan het leefstijlprogramma deel te nemen en deze ook af te maken?

☐ Ja, de door mij gekozen financiële prikkel zou mij wel motiveren om deel te nemen aan het leefstijlprogramma en deze ook af te maken als deze mij in werkelijkheid wordt aangeboden.

☐ Nee, de door mij gekozen financiële prikkel zou mij niet motiveren om deel te nemen aan het leefstijlprogramma en ook niet om het programma af te maken als deze mij in werkelijkheid wordt aangeboden.

Keuze 8		**Financiële prikkel A**	**Financiële prikkel B**
Stelt u zich voor dat uw huisarts u aanraadt om deel te nemen aan het leefstijlprogramma dat is beschreven op de eerste pagina van de vragenlijst. Welke financiële prikkel zou u dan het meeste motiveren om aan het leefstijlprogramma deel te nemen EN deze af te maken?	**Vorm**	Theater- en concertbon	Contant geld
	Hoogte	65	100
	Moment	Achteraf	Halverwege en achteraf
	Eisen	Individuele prestatie fitheidstest	75% aanwezigheid individu
		☐	☐

Als u in werkelijkheid deze prikkel aangeboden krijgt bij een leefstijlprogramma, zou dit u dan motiveren om aan het leefstijlprogramma deel te nemen en deze ook af te maken?

☐ Ja, de door mij gekozen financiële prikkel zou mij wel motiveren om deel te nemen aan het leefstijlprogramma en deze ook af te maken als deze mij in werkelijkheid wordt aangeboden.

☐ Nee, de door mij gekozen financiële prikkel zou mij niet motiveren om deel te nemen aan het leefstijlprogramma en ook niet om het programma af te maken als deze mij in werkelijkheid wordt aangeboden.

Keuze 9		**Financiële prikkel A**	**Financiële prikkel B**
Stelt u zich voor dat uw huisarts u aanraadt om deel te nemen aan het leefstijlprogramma dat is beschreven op de eerste pagina van de vragenlijst. Welke financiële prikkel zou u dan het meeste motiveren om aan het leefstijlprogramma deel te nemen EN deze af te maken?	**Vorm**	Contant geld	Theater- en concertbon
	Hoogte	35	100
	Moment	Halverwege en achteraf	Achteraf
	Eisen	75% aanwezigheid groep	75% aanwezigheid individu
		☐	☐

Als u in werkelijkheid deze prikkel aangeboden krijgt bij een leefstijlprogramma, zou dit u dan motiveren om aan het leefstijlprogramma deel te nemen en deze ook af te maken?

☐ Ja, de door mij gekozen financiële prikkel zou mij wel motiveren om deel te nemen aan het leefstijlprogramma en deze ook af te maken als deze mij in werkelijkheid wordt aangeboden.

☐ Nee, de door mij gekozen financiële prikkel zou mij niet motiveren om deel te nemen aan het leefstijlprogramma en ook niet om het programma af te maken als deze mij in werkelijkheid wordt aangeboden.

> Tot slot volgen nu nog enkele vragen over financiële prikkels.

32. Wat is uw mening over het inzetten van financiële prikkels om mensen te motiveren aan hun gezondheid te werken?
   - ☐ Zeer nuttig
   - ☐ Nuttig
   - ☐ Neutraal
   - ☐ Niet zo nuttig
   - ☐ Helemaal niet nuttig

33. Denkt u dat een financiële prikkel mensen kan motiveren om aan hun gezondheid te werken?
   - ☐ Ja, ik denk dat dit een motivatie is voor iedereen.
   - ☐ Ja, maar alleen voor kleine groepen mensen.
   - ☐ Nee, ik denk dat het voor niemand een motivatie zal zijn.

34. Denkt u dat een financiële prikkel u kan motiveren om aan uw gezondheid te werken?
   - ☐ Ja
   - ☐ Nee
   - ☐ Weet ik niet

35. Wat zou u een reëel waarde vinden van een financiële prikkel welke u zou krijgen bij het al besproken leefstijlprogramma?
   - ☐ **[.....]** euro

36. Als u een financiële prikkel aangeboden krijgt bij de al besproken gecombineerde leefstijlinterventie, wat voor soort beloning zou u dan het liefst krijgen?
   - ☐ Contant geld
   - ☐ Cadeaubon, voor [.....]
   - ☐ Cadeau, namelijk [.....]
   - ☐ Anders, namelijk [.....]

37. Als u een financiële prikkel aangeboden krijgt bij de al besproken gecombineerde leefstijlinterventie, aan welke eisen vindt u dat moeten worden voldaan voordat de beloning wordt uitgereikt?

- ☐ Geen eisen
- ☐ Wel eisen, namelijk [.....]
- ☐ Wel eisen, maar ik weet niet welke eisen

> Dit is het einde van de vragenlijst, wilt u controleren of u alle vragen heeft ingevuld?

Bedankt voor uw deelname!

> U kunt de vragenlijst terug sturen in de bijgevoegde antwoordenveloppe

Questionnaire Financial incentives

Explanation of the questionnaire

Nowadays, much attention is paid to a healthy lifestyle.

A healthy lifestyle is important to prevent diseases and other health problems. Many people struggle to maintain a healthy lifestyle or determine what is healthy for them. To help people to get a healthy lifestyle, lifestyle programs have been developed. It has been found that people find it easier to maintain a lifestyle program if they receive a reward for this. This questionnaire asks for your opinion towards lifestyle programs and financial incentives.

The text blocks below briefly explain what we mean by these two terms.

Lifestyle program

A lifestyle program contains activities:

- that has the aim to work on your health.
- which focuses on both exercise and nutrition and
- that are offered by professional healthcare providers

The program as referred to in this questionnaire has the following characteristics:

- Exercise sessions at the physiotherapist once a week for a period of 6 weeks.
- In about the same period 3 group sessions and 3 individual visits to the dietitian to get advice about a healthy diet.
- At the end of this period, together with you for a physical activity that suits you in the neighborhood.

Financial incentive

With the term financial incentive we mean a reward with a monetary value. Such a financial incentive could for example, motivate people to start improving their lifestyle or achieving a certain result that has been agreed in advance.

The questionnaire starts with a some general questions and a number of questions about your health.

This is followed by a number of questions about lifestyle programs and financial incentives. Some questions require extra explanation.

We ask you to consider the lifestyle program described above when completing the questionnaire.

This is followed by a number of questions about lifestyle programs and financial incentives. Some questions contain extra explanation.

Please complete the questionnaire as completely as possible. Every question can only have one answer option filled out, if otherwise it is mentioned. Filling out the questionnaire will take about 30 minutes. Your data will be treated confidential and will not be provided to others. The researcher will not be able to link the data to individual respondents.

For questions about the questionnaire, please contact Claudia Molema, researcher.
E-mail: claudia.molema@rivm.nl
Phone number: 030-274 2753

Please fill in the date on which you filled in the questionnaire.

day month year
[.][.] [.][.] [.][.][.][.]

1. What is your age?

[...][...] **years**
☐

2. What is your gender?

☐ Man
☐ Women

3. What is your highest education?

☐ Primary education (ISCED 1)
☐ Lower secondary education (ISCED 2)
☐ Upper secondary education (ISCED 3)
☐ Upper secondary work-related education (ISCED 3)
☐ Post-secondary but non-tertiary education (ISCED 4)
☐ First stage of tertiary education (ISCED 5 and 6)
☐ second stage of tertiary education (ISCED 7)
☐ Other, namely [.....]

4. What is the average gross income of your household per month?

☐ €1000 or less
☐ €1000 to €2000
☐ €2000 to €3000
☐ €3000 to €4000
☐ €4000 to €5000
☐ €5000 or more

5. What is your marital status?

☐ Single
☐ Living together
☐ Married

6. How many persons does your household currently have?

☐ 1 person
☐ 2 persons
☐ 3-4 persons
☐ 5 or more persons

1 Below we ask you some questions about your personal situation

7. What is your country of birth?

☐ The Netherlands
☐ Suriname
☐ Netherlands Antilles
☐ Aruba
☐ Turkey
☐ Morocco
☐ Other, namely [.....]

8. What is the country of birth of your mother?

☐ The Netherlands
☐ Suriname
☐ Netherlands Antilles
☐ Aruba
☐ Turkey
☐ Morocco
☐ Other, namely [.....]

9. What is the country of birth of your father?
   - ☐ The Netherlands
   - ☐ Suriname
   - ☐ Netherlands Antilles
   - ☐ Aruba
   - ☐ Turkey
   - ☐ Morocco
   - ☐ Other, namely [.....]

10. To which population group do you consider yourself to belong? *Please select only one answer.*
   - ☐ The Netherlands
   - ☐ Suriname
   - ☐ Netherlands Antilles
   - ☐ Aruba
   - ☐ Turkey
   - ☐ Morocco
   - ☐ Other, namely [.....]

11. How many days a week do you cycle and/or walk on average per week? *(this includes cycling and walking in your spare time, but also cycling or walking to, for example, work or the supermarket)*
   - ☐ 0 days
   - ☐ 1 day
   - ☐ 2 days
   - ☐ 3 days
   - ☐ 4 days
   - ☐ 5 days
   - ☐ 6 days
   - ☐ 7 days

12. How many time do you spend on cycling and walking on average per day? *If your answer was '0 days' for question 11, you can skip this question.*
   - ☐ Less than 15 minutes per day
   - ☐ 15–30 minutes per day
   - ☐ 30–60 minutes per day
   - ☐ More than 60 minutes per day

13. Do you play sports? *(walking and cycling are excluded)*
   - ☐ No, I do not play sports.
   - ☐ Yes, I do play sports, but less than 1 time a week
   - ☐ Ja, I do play sports for 1–2 times a week
   - ☐ Ja, ik sport 3 keer per week of vaker

14. How much time do you spend on exercise on average each session? *If your answer was 'No, I do not play sports' for question 13, you can skip this question.*
   - ☐ Less than 15 minutes per session
   - ☐ 30–60 minutes per session
   - ☐ More than 60 minutes per session

15. Has something changed in the past three months in how much you exercise?
   - ☐ Yes, I started to move more
   - ☐ Ja, I started to move less
   - ☐ No, nothing has changed

16. How much fruit and vegetables do you eat on average per day?

Fruit:
- ☐ 1 piece or less per day
- ☐ 2 pieces per day
- ☐ 3 pieces per day
- ☐ 4 pieces or more per day

Vegetables:
- ☐ 1 serving spoon or less per day
- ☐ 2 serving spoons per day
- ☐ 3 serving spoons per day
- ☐ 4 serving spoons or more per day

17. Has something changed in the past three months in how much fruits and vegetables you eat?
- ☐ Yes, I started to eat more vegetables and/or fruit
- ☐ Yes, I started to eat less vegetables and/or fruit
- ☐ No, nothing has changed

18. What do you think about your own health status in general
- ☐ Very good
- ☐ Good
- ☐ It's ok
- ☐ Bad
- ☐ Very bad

> Would you mark the answer that fits best for your situation today.

Translation of questions below can be found on www.euroqol.org EQ5D-5L questionnaire.

19. Mobiliteit
- ☐ Ik heb geen problemen met lopen
- ☐ Ik heb een beetje problemen met lopen
- ☐ Ik heb matige problemen met lopen
- ☐ Ik heb ernstige problemen met lopen
- ☐ Ik ben niet in staat om te lopen

20. Zelfzorg
- ☐ Ik heb geen problemen met mijzelf wassen of aankleden
- ☐ Ik heb een beetje problemen met mijzelf wassen of aankleden
- ☐ Ik heb matige problemen met mijzelf wassen of aankleden
- ☐ Ik heb ernstige problemen met mijzelf wassen of aankleden
- ☐ Ik ben niet in staat mijzelf te wassen of aan te kleden

21. Dagelijkse activiteiten *(bijv. werk, studie, huishouden, gezins- en vrijetijdsactiviteiten)*
- ☐ Ik heb geen problemen met mijn dagelijkse activiteiten
- ☐ Ik heb een beetje problemen met mijn dagelijkse activiteiten
- ☐ Ik heb matige problemen met mijn dagelijkse activiteiten
- ☐ Ik heb ernstige problemen met mijn dagelijkse activiteiten
- ☐ Ik ben niet in staat mijn dagelijkse activiteiten uit te voeren

22. Pijn/ongemak
- ☐ Ik heb geen pijn of ongemak
- ☐ Ik heb een beetje pijn of ongemak
- ☐ Ik heb matige pijn of ongemak
- ☐ Ik heb ernstige pijn of ongemak
- ☐ Ik heb extreme pijn of ongemak

23. Angst/somberheid
- ☐ Ik ben niet angstig of somber
- ☐ Ik ben een beetje angstig of somber
- ☐ Ik ben matig angstig of somber
- ☐ Ik ben erg angstig of somber
- ☐ Ik ben extreem angstig of somber

Translation of questions 24, 25, and 26 can be found in the paper:

Chew LD, Bradley KA, Boyko EJ. Brief questions to identify patients with inadequate health literacy. Family medicine. 2004;36(8):588-94. PubMed PMID: 15343421.

24. Hoe vaak helpt iemand u met het lezen van brieven of folders van uw huisarts of het ziekenhuis?
    - ☐ Nooit
    - ☐ Af en toe
    - ☐ Soms
    - ☐ Vaak
    - ☐ Altijd

25. Hoe zeker bent u ervan dat u medische formulieren zelf goed invult?
    - ☐ Heel erg
    - ☐ Nogal
    - ☐ Een beetje
    - ☐ Een klein beetje
    - ☐ Helemaal niet

26. Hoe vaak is het moeilijk voor u om meer te weten te komen over uw gezondheid, omdat u geschreven informatie niet goed begrijpt?
    - ☐ Nooit
    - ☐ Af en toe
    - ☐ Soms
    - ☐ Vaak
    - ☐ Altijd

27. Have you ever participated in a lifestyle program?
    - ☐ Yes, a lifestyle program for nutrition and/or exercise behavior.
    - ☐ Yes, a lifestyle program for another subject than nutrition and/or exercise behavior
    - ☐ No
    - ☐ I don't know

28. Wat is uw mening over een leefstijlprogramma in het algemeen?
    - ☐ Very useful
    - ☐ Useful
    - ☐ Neutral
    - ☐ Not very useful
    - ☐ Not useful at all

29. Zou u zelf graag (nog een keer) mee willen doen aan een leefstijlprogramma over voeding en/of bewegen
    - ☐ Definitely yes
    - ☐ Probably yes
    - ☐ I don't know
    - ☐ Maybe
    - ☐ Definitely no

2 Which financial incentive do you prefer?

In this section of the questionnaire, we will present you multiple choice tasks between 2 situations. In total, we present you with 9 choice tasks. The purpose is that you always choose the situation that you would also choose in real life. The first column always shows the same, in the two columns next to it you will find small differences about the characteristics of the financial incentive.
Below is an explanation of the characteristics we use in this part of the questionnaire, followed by an example of a choice task.

> It is important that you read first the explanation below before continuing with the questionnaire.

Form: The reward can have several forms:
- Cash
- Voucher: this can be handed in at almost all larger stores.
- Dinner voucher: you can hand it in at participating restaurants.
- Theater and concert voucher: you can pay for tickets for a theater show or concert.

Value: The reward can have different values. The amount mentioned is the total amount, so if you receive a reward on several moments, then that is always a part of the total value:
- 15 euro
- 35 euro
- 65 euro
- 100 euro

Moment: The reward can be handed out at different moments
- On beforehand: you will receive the reward at the start of the lifestyle program
- Afterwards: you will receive the reward the end of the lifestyle program
- Halfway and afterwards: halfway of the lifestyle program you will receive half the reward
- and after the program the other half of the reward.

Prerequisite: prerequisites can be set for getting the reward. If the prerequisite is not met, you will not receive the reward.
- *Registration for the lifestyle program:* if you register for the program, you will receive the reward.

- *75% attendance at individual level individual:* you must have attended at least 75% of the meetings (i.e. at least 9 of the 12 meetings with the physiotherapist and the dietitian).
- *75% attendance at group level:* the entire group must have attended at least 75% of the meetings (i.e. at least 9 out of 12 meetings with the physiotherapist and the dietitian).
- *Individual result fitness test:* you will receive the reward if you have a better score at the end of the program than at the start of the program on the fitness test. A fitness test measures your strength and condition.
- *Group result fitness test:* you receive the reward if at least 80% (8 out of 10) participants score better at the end of the program than at the start of the fitness test. A fitness test measures your strength and condition.

30. Which of the features described on the previous page is most important to you in choosing a financial incentive?
- ☐ Form of the financial incentive
- ☐ Value of the financial incentive
- ☐ Moment of receiving the incentive
- ☐ Prerequisite for receiving the incentive

31. Which of de characteristics described on the previous page is least important to you in choosing a financial incentive?
- ☐ Form of the financial incentive
- ☐ Value of the financial incentive
- ☐ Moment of receiving the incentive
- ☐ Prerequisite for receiving the incentive

Choice		**Financial incentive A**	**Financial incentive B**
Imagine that your physician recommends that you participate in the lifestyle program as described above. Which financial incentive would motivate you most to participate in the lifestyle program and to complete it?	**Form**	Cash money	Gift voucher
	Value	100	65
	Moment	Afterwards of the intervention	Afterwards of the intervention
	Prerequisite	Group result fitness test	Individual result fitness test
		☐	☐

If this incentive is offered to you in real-life in combination with a lifestyle program, would it motivate you to participate in the lifestyle program and to complete it?

☐ Yes, the by me chosen financial incentive would motivate me to participate in the lifestyle program and to complete it, if this was offered to me in real-life
☐ No, the by me chosen financial incentive would not motivate me to participate in the lifestyle program and to complete it, if this was offered to me in real-life.

Each choice set consists of two parts as you have seen above. First of all, you choose which of the 2 financial incentives are most appealing to you. Then there is a question whether the chosen incentive would actually motivate you.

It is important to make the choice between the two financial incentives in each situation first and then fill out the question that asks whether this would actually motivate you.

There are now a number of choice sets, such as the example above. Please always tick the financial incentive you would prefer. When we mention the lifestyle program, we mean the program described on page 1.

After the example and instruction, 9 choice tasks are presented. There are two versions, because 18 choice tasks were divided over two blocks.

32. What is your opinion about the use of financial incentives to motivate people to work on their health?
☐ Very useful
☐ Useful
☐ Neutral
☐ Not very useful
☐ Not useful at all

33. Do you think that a financial incentive can motivate people to work on their health?
☐ Yes, I believe a financial incentive is a motivation for everyone
☐ Yes, but only for a small group of people
☐ No, I do not believe a financial incentive is a motivation

34. Do you think that a financial incentive can motivate you to work on your health?
☐ Yes
☐ No
☐ I don't know

35. What would you consider to be a realistic value of a financial incentive that you would receive in the already discussed lifestyle program?

☐ [.....] euro

36. If you receive a financial incentive from the combined lifestyle intervention discussed above, what form of reward would you prefer?

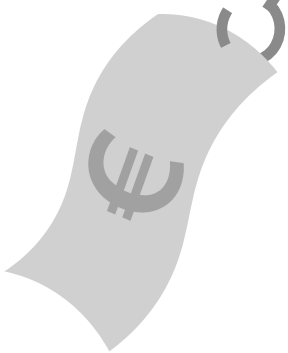
☐ Cash money
☐ Voucher, for [.....]
☐ Present, namely [.....]
☐ Other, namely [.....]

37. If you receive a financial incentive from the combined lifestyle intervention discussed above, what prerequisites do you think should be met before the reward is awarded?

☐ No prerequisites
☐ Prerequisites in the form of [.....]
☐ Some prerequisite, but I don't know in which form

Chapter 4

Perceived barriers and facilitators of the implementation of a combined lifestyle intervention with a financial incentive for chronically ill patients



Molema, C. C. M., Wendel-Vos, G. C. W., Ter Schegget, S., Schuit, A. J., & van de Goor, L. A. M. (2019).

Perceived barriers and facilitators of the implementation of a combined lifestyle intervention with a financial incentive for chronically ill patients. BMC Fam Pract, 20(1), 137. doi:10.1186/s12875-019-1025-5

Abstract

Background: This study aims to describe barriers and facilitators of the implementation of a combined lifestyle intervention (CLI) in primary care for patients with chronic disease. The aim of CLI to help patients to create a healthy lifestyle and to maintain this healthy lifestyle. During a CLI a patient receives advice and counselling to improve health-related behavior such as physical activity and diet. Special attention was given to the influence of adding a health promoting financial incentive (HPFI) for the participants to the CLI.

Methods: 24 semi-structured interviews within six care groups were performed between July and October 2017. The interviews were transcribed verbatim and coded by two researchers independently.

Results: Respondents mentioned several preferred characteristics of the CLI such as easy accessibility of the intervention site and the presence of health care professionals during exercise sessions. Moreover, factors that could influence implementation (such as attitude of the health care professionals) and preconditions for a successful implementation of a CLI (such as structural funding and good infrastructure) were identified. Overall, positive HPFIs (e.g. a reward) were preferred over negative HPFIs (e.g. a fine). According to the respondents, HPFIs could positively influence the degree of participation, and break down barriers for participating in and finishing the CLI.

Conclusions: Multiple barriers and facilitators for successful implementation of a CLI were identified. For successful implementing CLIs, a positive attitude of all stakeholders is essential and specific preconditions should be fulfilled. With regard to adding a HPFI, more research is needed to identify the attitude of specific target groups towards an HPFI.

Keywords: lifestyle intervention, physical activity, implementation, primary care, chronic illness, qualitative research.

Introduction

Increased obesity rates and decreased physical activity levels are strongly linked with increased prevalence and incidence of diabetes mellitus type 2 (DM2) [1, 2].
In the Netherlands, a so called 'care group' (a legal entity that is part of the primary care sector) has the responsibility to arrange and to contract all care for DM2 and cardiovascular disease (CVD) patients as prescribed through the Dutch Health Care Standards [3]. There are over 100 care groups in the Netherlands, which all operate in a specific region. A care group receives a fixed amount of money per patient from the health care insurer and has to contract all health care providers, such as general practitioners, needed to deliver the necessary care [3]. This fixed amount per patient is supposed to constitute an incentive for the care group to invest in prevention. By investing in prevention, the health status of patients might improve which can contribute to less intensive care a patient needs and fewer consults for example. Implementing combined lifestyle interventions (CLI) are such a form of prevention. A CLI is an intervention that aims to help patients change their lifestyle in a healthy way and to maintain this new healthy lifestyle. During a CLI, patients are supported by healthcare professionals to create a healthy lifestyle and to get tools to adhere to this healthy lifestyle. A CLI consists of advice and counseling to improve health related-behaviors as physical activity and eating habits. Lack of physical activity is associated with a less favorable progress in DM2 disease course and an increase in all-cause mortality rates [4]. Moreover, patients already diagnosed with DM2 or CVD have a high prevalence of physical inactivity [5]. Hence, lifestyle interventions including attention for physical activity are being implemented to prevent DM2 in high-risk patients and favorably influence the course of disease in DM2 patients. These interventions seem to be at least as effective as pharmacological interventions and reduced the risk of developing diabetes in people with impaired glucose tolerance by about 50% [1]. A CLI aims to improve health-related behavior such as physical activity and diet. By adapting healthy lifestyle habits, complications or worsening of DM2 and/or CVD might be prevented, postponed or even reversed [4, 6]. Effective CLIs will result in increased quality of life for patients and lower medical costs. However, successful implementation of these interventions poses a challenge, since participation rates tend to be low [7, 8]. Reasons for low participation rates might be lack of time, costs of participating or transport issues [9]. Searching for ways to improve participation rates and adherence to prescribed lifestyle interventions, health promoting financial incentives (HPFIs) are implemented as addition to the CLI.
HPFIs are cash or cash-like rewards or fines provided contingent on (non-)performance of healthy behaviors [10]. Besides the two main categories of positive (e.g. reward or discount) or negative (e.g. a fine or higher out of pocket costs) financial incentives, there is great variation in characteristics of an HPFI. Saving campaigns or deposit contracts are also a form of a HPFI. Saving campaigns in general, like collecting loyalty points for free products, are popular in

the Netherlands. A deposit contract means that participants of a CLI pay a certain amount of money to participate, and by meeting prerequisites that are determined at the start of the CLI they can get a part of the amount of the whole amount of the deposit back.
The effectiveness of HPFIs added to a CLI on for example participation rates or program adherence is not proven yet. Only a few studies had a good study design and besides some short-term effect, no long-term effects were found [11]. HPFIs are not implemented frequently in the primary care setting in the Netherlands, but there is increasing interest in implementation of HPFIs. For a successful implementation process, it is necessary to have more elaborate knowledge on what the opinions of the stakeholders are. This descriptive qualitative study shows barriers and facilitators in the implementation of a CLI in care groups for patients with DM2 or CVD, as perceived by the stakeholders, with special attention for the supposed influence of adding a HPFI to the CLI on the implementation process [12].

Methods

Implementation process CLI and HPFI

Originally, our study aimed to investigate the (cost) effectiveness of adding a HPFI to a CLI.
However, despite great effort within the participating care group to create support for the CLI, and extensive research beforehand on the preferences of the target population regarding optimal characteristics of the HPFI [13], the implementation process of this specific CLI hampered and the number of patients willing and able to participate was too low to start the CLI. As a consequence, the effect evaluation and the cost effectiveness study of that particular CLI was cancelled. Instead we executed a more elaborate and broader process evaluation of CLIs in general in order to learn more on the implementation process of a CLI and the feasibility of implementing a HPFI.

Design and procedures

A qualitative research design with semi-structured interviews was used to investigate the opinions of professionals involved in six Dutch care groups offering a CLI. This selection of care groups consisted of the particular care group that planned to implement the CLI and a HPFI and did not succeed and five other care groups. General practitioners, practice nurses, representatives of management of the care groups, as well as community health services policy staff related to these care groups were interviewed about barriers and facilitators for implementation of CLIs in primary care for patients with DM2 and/or CVD and about the possibility of complementing these CLIs with a HPFI. The research proposal was reviewed and approved by the Ethical Review Board of the Tilburg University before executing the study.

Respondents

Care groups eligible for this study had to offer a CLI to patients with DM2 and/or CVD. This intervention had to include both a diet and physical activity component. One researcher (StS) viewed the websites of 94 care groups in the Netherlands and identified twelve care groups that fulfilled these criteria. These care groups differed in size and region. The smallest care group included 11 general practitioners, whereas the largest care group included more than 200 general practitioners. In general, these 12 care groups were mostly located in the southern and western parts of the Netherlands. In total, six care groups were included in this study. Besides the care group that planned to implement the CLI and HPFI, a purposive sample of five care groups was taken out of the twelve other care groups identified to be eligible and proven to be willing to participate. This resulted in six care groups in total that varied in size.

Potential respondents were invited to participate in the study via email. If no response by email was received, they were contacted by telephone. In total 24 interviews (at least 3 persons per care group) were conducted with care group managers, general practitioners, practice nurses, community health services policy staff related to the care groups and one manager of a health care insurer. Table 1 shows the respondents for each of the six care groups.

Table 1. Respondents per care group

Care group	GP	Practice nurse	Representative management of care group	Community health services policy staff*	Other
1**	X	X***	X	X	1 dietician, 1 physiotherapist, 1 health care insurer
2****	X	X	X		
3	X	X	X	X	
4	X		X	X	
5	X	X	X	X	
6		X	X	X	

*1 community health service had 2 care groups in its region. In total 4 interviews with community health services were performed.

** Care group of the original study region
*** 3 practice nurses were interviewed from the care group of the original study region.
**** The GP and practice nurse from this care group were interviewed together.

Research questions

The interview guide (Appendix 1) was set up to provide information with regard to following research questions:

- What are preferred characteristics of a CLI and factors expected to influence implementation of a CLI according to the respondents?
- What are preconditions for successful implementation of a CLI?
- What are preferred characteristics and the expected effect of HPFIs when added to a CLI according to the respondents?
- What is the attitude of the respondents towards HPFIs in relation to a CLI?

Data collection

Semi-structured interviews were conducted mostly face-to-face and some by telephone. Data collection took place between March and October 2017. An interview guide was used to discuss the barriers, facilitators and experiences with implementation of a CLI, the role HPFIs can play, opinions with regard to the content and effectiveness of HPFIs and the expectations for the future with regard to CLIs and HPFIs for patients with DM2 and CVD in primary care.

Before the start of the interview, respondents signed a written informed consent, agreeing to participate in the study and to the audio recording of the interview. The interviews were held in private, so the respondent could speak freely. The interviews lasted between 30 to 60 minutes, were transcribed verbatim and were rendered anonymous so that they could not be traced to the respondents. The two interviews were performed by both CM and StS to determine how the design of the interview guide worked out in practice. We did not make adjustments to the interview guide. Researchers StS and TdV performed the following interviews individually. Both interviewers did not have work-related contact with the interviewees and were independent. In this way, we have done our best to ensure respondents would not give social desirable answers. After 24 interviews, no new results were identified and therefore we believe we reached data saturation and stopped the inclusion of care groups for the study.

Data analysis

The interviews were analyzed using a thematic approach with support of the software program MAXQDA 2018. The focus of the thematic content analysis is coding and analyzing the interviews with regard to themes [14, 15]. First, a more inductive approach was chosen and pieces of text were marked and received summarizing terms like, “long-term vision” or “opinion with regard to financial incentives” [15]. This process of open coding resulted in a list of codes. Secondly, the codes from phase 1 were ordered, deleted or merged with other codes by using axial coding. Moreover, codes were clustered and a distinction was made between main and sub codes, which resulted in a code tree with main codes like, “barriers for

implementation" and sub codes like "lack of time", "" and "funding". Thirdly, the categories were structured and the most important categories were determined by using selective coding (Appendix 2). Three researchers (StS, CM, WWV) worked independently to analyze data and formed pairs to gain consensus and to guarantee the credibility. If no consensus was achieved, a third researcher (WWV and LvdG) was consulted to reach a final decision.

Results

First, the preferred characteristics of a CLI, factors expected to influence implementation of a CLI and preconditions for successful implementation of a CLI are presented. Second, insights are given with respect to preferred characteristics of HPFIs, expected effects of HPFIs when added to a CLI and the attitude of respondents towards HPFIs.

Combined lifestyle interventions (CLIs)

Preferred characteristics of CLI

Easy accessibility of the intervention site, in other words being close to home and the content of the CLI is appropriate for everyone, was mentioned by most respondents as a facilitating factor for participation in a CLI, because most patients have little or no intrinsic motivation to go exercising. In rural areas, this would mean 'within the same village' and in urban areas 'within the same neighborhood'. The intervention called 'Biowalking' was considered easily accessible, because it has a very low-threshold, just walking in nature with a group of participants. Many respondents had an opinion with regard to group interventions and the social aspect, but these opinions varied and no clear preference for a group or individual intervention was found. Social interaction and connection between group members was suggested as a factor that would foster the adherence of the intervention itself. A group is a binding factor, because it is pleasant, patients support each other and give advice to each other. Group pressure and positive experiences of other patients can be a motivation for participants. At the same time, some participants mentioned that the group setting could also be a barrier for participating in a CLI. Participating in a group intervention can be scary, because new participants are unfamiliar with the rest of the group. A more practical difficulty that was mentioned is that not all participants can be expected to be available at the same moment for the sessions.

Quote 1:

> *"We see that the group process and pressure motivates people to exercise, but also to get in touch with others and share information about diabetes or other conditions."*

A facilitating factor mentioned in the more medical context was the presence of health care professionals during sessions of the CLI. For example, respondents anticipated that DM2 patients might find it a comforting idea that if they get hypoglycemia during physical activity, a health care professional is present to give medical care or advice. Respondents also mentioned that the CLI has to fit to the needs of the target group. For example patients with low health literacy or speaking a foreign language as their native language should be supervised by someone who talks slow and simple language so the patients are able to understand the information given to them. Moreover, the content of the CLI has to fit to the perspective of the patient on what he or she believes is important to improve with regard to their health status and/or health behavior.

In general, respondents were concerned about patients not being able to continue with behavioral change achieved within a CLI after the intervention was finished. An important facilitator in this respect was creating a good transition to regular sports clubs and facilities; i.e. outside of the health care sector.

Many respondents had an opinion on out of pocket costs for the patients, but the opinions of were not univocal. Part of them mentioned out of pocket costs for the patients as a facilitator for participation because it creates motivation for attending sessions and finishing the program. In addition, they expected patients to make a more well-considered decision whether or not to participate in a CLI. On the other hand, a similar number of respondents stated that out of pocket costs might be a barrier for participation, especially for patients with a low budget.

Quote 2:

> *"What I actually think, out-of-pocket costs can also stimulate. If you choose to do it and you pay for it, you also have more inclination to go for it. If it is all non-committal, you tend to be less concerned with it, that is the way in which people think. I do not think everything just has to be for free."*

Factors expected to influence implementation of CLI

A facilitating factor that respondents marked as important was that health care professionals know which CLIs are available to offer their patients. Such knowledge, they indicated, is not always present. Another related facilitating factor mentioned was that referral to a CLI is easier if associated health care professionals know each other and already cooperate in a broader sense. Moreover, word of mouth promotion by the participants themselves could also facilitate implementation of a CLI. Respondents pointed out that successful recruitment of participants for the CLI is important. Factors that were mentioned to possibly facilitate recruitment were a recruitment strategy adjusted to the goals of the target group, and personal contact between health care professional and patients. About three quarters of the

respondents mentioned that enthusiasm and willingness among health care professionals is very important. Enthusiastic health care professionals tend to propagate successes of the CLI and they tend to take a more active role in identifying eligible patients and offering the CLI to them. Willingness to invest in implementing a CLI and invest time to convince patients to participate in a CLI is important for successful implementation. In addition, timing constituted an important facilitating factor according to the respondents. For example, short after diagnosis of DM2, patients are more prone to participate in a CLI.

Quote 3:

> *"I have already noticed in this course, that you are very dependent on the practice nurse and the general practitioner who is in agreement with the patients. And if the practice nurse or general practitioner does not believe in the program or only sees obstacles, they are less motivated to motivate the patients. I saw the effect."*

Over half of the respondents mentioned lack of (long-term) funding as an important barrier for implementation. In general, respondents felt that health care insurers are not very keen on financing a CLI or another form of prevention programs. If funding was available most of the time it was temporarily. In this case they experienced that when funding stopped, the CLI also stopped. Other factors mentioned are lack of ownership and lack of time. According to almost all respondents, a barrier for implementation for a CLI is that health care professionals don not always tend to consider themselves responsible for offering a CLI and they state a lack of time to present it to their patients. At the same time, a few respondents mentioned that practice nurses are more willing than GPs to implement a CLI in their practice even though lack of time is also an important barrier for them. Another barrier that was mentioned was that CLIs often are not tailored to hard-to-reach groups, such as (female) immigrants who do not speak the Dutch language or patients who only visit the GP practice once a year. About half of the respondents also pointed out that in some cases health care professionals tend to decide beforehand which patients they believe do not want to participate in a CLI for multiple reasons, resulting in non-referral. They all agreed this is not desirable. Low or no inflow of participants was also mentioned as a barrier for implementation. Patient-related factors that were identified were lack of motivation to put effort in their own health and lack of time. Two respondents suggested a quite radical change of the integrated care program to support the implementation of a CLI. Instead of having a care program aiming at managing one particular disease such as DM2 or CVD, which is the current situation in the Netherlands, they suggested a mandatory prevention program initiated by health care professionals aiming to prevent chronic disease from a healthy lifestyle perspective. This prevention program should not have a single disease focus like the programs that are nowadays applicable in primary care in the Netherlands.

Preconditions for successful implementation of CLI

When explicitly asked, the health care professionals suggested several essential preconditions for successful implementation of a CLI. The following preconditions are sorted by mentioned most to mentioned least:

- Funding which has to be arranged and clear beforehand.
- The CLI has to fit the needs of the target group. This might demand a custom-made program per participant.
- Incorporating proven effective elements in a well-considered plan for the content of a CLI.
- A good infrastructure and communication between all stakeholders.
- Motivated and enthusiastic health care professionals, as well as constructive collaboration between all different health care professionals.
- A tailored recruitment strategy resulting in a continuous inflow of eligible participants.

Health promoting financial incentives (HPFIs)

Preferred characteristics of HPFIs

Overall, positive HPFIs were preferred over negative HPFIs. Respondents expected negative HPFIs (e.g. pay a fine or other extra costs) to raise aversion with the patients resulting in them choosing not to participate in the CLI at all. Especially for patients with a low budget they expected this fine or extra costs to be a large threshold.

Quote 4:

> *"That punishment does not seem the solution to me. I mean, if you tell me: 'if you do not come, you have to pay a fine'. Then I say: 'well, I will not participate at all".*

Respondents suggested several forms of positive HPFIs, such as a discount on their health insurance fee, participating in a CLI without costs, saving campaigns, deposit contracts and discounts on or freely available fruit and vegetables, or free sports materials. Some of the respondents suggested that the positive HPFI should not be given at the end of a program, but divided over times in small steps. Saving campaigns (e.g. loyalty points for free products) were particularly mentioned, because this type of HPFI is already familiar to most people and they expected long-term effects when a HPFI would link with systems and processes already effectively implemented in the daily lives of people. Deposit contracts were also among the frequently mentioned preferred characteristics of HPFIs. In this case, patients pay to participate in a CLI and could regain (a part of) the amount paid for example by attending all appointments.

Expected effects of HPFIs

About half of the respondents mentioned that adding a positive HPFI to a CLI could potentially break down barriers for patients to enroll in a CLI and even positively influence the amount of participants finishing the program. Majority of the respondents touched on the discussion whether an extrinsic motivator such as a HPFI could be the key to building intrinsic motivation for behavioral change. By breaking down the barriers to participate, enrolled patients might experience the effects of more exercise and healthy nutrition on their health. As a consequence of feeling better, they may continue the program or their adapted behavior. However, in general the respondents did not expect HPFIs to generate long-term effects. They expected most patients to revert to their old habits after completing a CLI, despite the HPFI. They suggested a continuous stimulant in the form of a HPFI or regular checks by a health care professional to prevent relapse. Specifically for patients with a low budget, they thought it would be helpful if the HPFI could take the form of a fully reimbursed program.

Quotes 5 and 6:

"Well, I think motivation can be bought."

"No, I do not believe in financial incentives. I think that the only effective incentive is a social one."

Attitude towards HPFIs

Overall, the attitude of the respondents with regard to adding a HPFI to a CLI diverged. Most respondents preferred participants in a CLI who have intrinsic motivation to participate, instead of participants who only participate in the CLI because they get a reward. There were also some respondents with a more positive attitude towards adding a HPFI to a CLI. They mentioned that they believed that patients would appreciate the reward for their efforts.

With regard to future implementation of HPFIs, respondents had different opinions. Part of them was convinced that it is more important to have an easy accessible CLI than to extrinsically motivate patients with a HPFI. Feasible forms of HPFIs mentioned were discount on the health care insurance or it could be that patients were exempted for paying out of pocket costs to participate in a CLI. In their opinion, collaboration with employers, industry and stores might help to fund HPFIs on a broader scale.

Discussion

In this study, we have evaluated perceived barriers and facilitators associated with the process of implementation of a CLI in primary care for patients with DM2 or CVD, the preferred characteristics of both a CLI and HPFI, with special attention for the influence of adding a HPFI to the CLI on the implementation process. To this aim, we interviewed health care professionals and other stakeholders from six care groups, such as a care group manager and a manager of a health care insurance company.
Preferred characteristics of the CLI, according to our respondents were easy accessibility, the presence of health care professionals during for example exercise sessions, content of the CLI fitted to what the patient believes is important to improve with regard to their health status and health behavior. Opinions were not univocal for out of pocket costs and a structure of the CLI with group consults. Factors promoting the implementation of a CLI according to the respondents were often related to attitude and behavior of health care professionals. Perceived facilitating factors mentioned were enthusiastic health care professionals, knowledge with regard to the CLI, and health care professionals involved in the CLI already knowing each other and cooperating in a broader sense. Preconditions for a successful implementation of a CLI mentioned were structural funding, good infrastructure and communication between stakeholders, the CLI being tailored to the needs of the target group, motivated health care professionals and a tailored recruitment strategy.
As to the HPFIs, respondents preferred positive HPFIs to negative HPFIs and generally agreed that adding a HPFI to a CLI could potentially break down barriers for patients to enroll in a CLI. A focus group study including the general public also showed that positive HPFIs are preferred [16]. They also expected it might have a positive influence on the degree of actual participation in the CLI and possibly even finishing the program. However, the respondents also questioned if an extrinsic motivator could be the key to achieve long-term behavioral change. Long-term effects of HPFIs were not expected.

A lack of time of the health care professionals was mentioned as a perceived barrier to offer CLIs to the patients. This perceived barrier was already mentioned in other studies and implies that a change is needed in the workload of the GP and practice nurse [17-19]. The study of the "Beweegkuur" (i.e. exercise on prescription) showed that out of pocket costs were a barrier for the patients to participate [17]. The respondents in our study shared this opinion, but it was also mentioned that out of pocket costs could help to make a more well considered decision to participate in a CLI. This contradiction was also found in the study of Geense et al. [19]. In our study, some respondents mentioned that prevention is mainly seen as a task for the practice nurse. Practice nurses have more time to explain the CLI to the patient, and in the Dutch system DM2 and CVD patients have most of their checkups at the practice nurse.

However, the qualitative study of Helmink et al. found though that it could be useful to let the GP ask the patient to participate in the CLI [17] because of the doctors' natural authority. The study of Geense et al. showed, comparable to our results, that the availability of a practice nurse is a facilitating factor for implementing lifestyle programs and that the attitude of GPs towards lifestyle interventions differ [19].

Patient engagement and paternalism in health care is addressed last decades more and more [20-22]. Shared decision making and patient centeredness is preferred over paternalism of the health care professional. Our study show that paternalism is still present in primary health care, because respondents mention that health care professionals tend to decide on beforehand which patients they believe would or would not participate in a CLI, without asking the patient. This is not desirable as patients are now excluded from participation while they might have motivation to participate. On beforehand of implementing a CLI, more attention should be paid to the process of shared decision making and patient engagement. The study of Elwyn et al. show that the degree of patient involvement will depend on the skills and attitude of the health care professional [23]. Possibly more education is necessary to develop the necessary skills and attitude of the health care professionals before implementing a CLI.

The number of studies that evaluated projects in which a HPFI was implemented to improve health behavior of patients is growing and results with regard to effectiveness is not univocal [24-26]. Despite the scientific interest in this instrument, most respondents in our study were critical with regard to HPFIs. The overall opinion was that an incentive would only be effective in the short term. Their opinion is in line with most results in the studies mentioned and the argumentation for savings systems, which could influence the participant in the long term, seems plausible [26, 27].

The implementation of an innovation, especially a preventive intervention such as a CLI, in health care is complex. As to the implementation process, the model of Fleuren et al. states that different determinants could influence the implementation process of innovations in health care [28]. Among these, characteristics of the person adopting the innovations and characteristics of the socio-political context, are important to mention. With regard of the characteristics of the person adopting the innovation, in this study the barrier was brought up that health care professionals were not always motivated to implement a CLI or did not see prevention as their task. This also relates to aspects of reimbursement and financing of preventive tasks within our health care system. With respect to the implementation of a CLI placed in the socio-political context, financing of the CLI is a perceived barrier. To be able to overcome all these difficulties, a long-term view and motivation of all stakeholders is important. It is relevant to identify the difficulties that can be expected and that a long-term view is necessary, so expectations of the stakeholders with regard to the implementation process are realistic.

Overall, many facilitators and barriers for successful implementation were identified in this paper. To design a CLI and successfully implement the CLI is not an easy task. Michie et al. have designed a framework called the Behavioural Change Wheel, which is based on the COM-B model [29]. This framework can help to design a CLI that can successfully achieve behavior change. The COM-B model shows the complexity of behavior change and the many factors that play a role. The components capability, motivation, and opportunity interact to create behavior and this behavior then influence the components. The results of our study on facilitators and barriers for implementation of a CLI is diverse, but seem consistent to the complex model of Michie et al. It is advisable to keep in mind the Behavioural Change Wheel when designing a CLI and the implementation process, to maximize the chance of success.

We have interviewed people with different perspectives to get the overall picture and to be able to identify similarities and differences in opinions of different stakeholders. Besides the health care professionals, we have also interviewed management representatives per care group. The opinion of the management of the care group is important, because they can play a role in the implementation process of a lifestyle intervention by helping to set preconditions and eliminate barriers for the implementation of a CLI. Managers often have a clear vison on the development of the care their care group should provide to their patients in the coming years.
Overall, no noticeable differences were found between the respondents of the care group in which originally the CLI with the HPFI would be implemented and the other care groups, which only offered a CLI. Therefore, all results were collectively discussed, also with regard to the addition of a HPFI.
Since this study focused on the implementation process of a CLI by the primary care group we have not included the patients in this study who have participated in a CLI or who were eligible to participate in a CLI. Further research should also have attention for this group. Due to the complexity of the subject, a focus group study might be more appropriate for this target group. Further research on the attitude of the end users towards HPFIs is necessary to generate more detailed knowledge on the settings in which HPFIs are appropriate to use and in which it might be counterproductive. Moreover, implementation of a CLI will be only successful if the characteristics of the CLI and the eventual HPFI are adjusted to the preferences of the end user.

Conclusion

Overall, we have identified important perceived barriers and facilitators for a successful implementation of a CLI in a primary care setting. Essential preconditions such as structural funding, tailored recruitment strategy, a good infrastructure and communication between all stakeholders, and a good fit of the CLI to the needs of the target group are important for

a successful implementation of a CLI. Another relevant factor is that it seems that a shift in attitude of the health care providers is necessary with regard to prevention in general and CLIs in specific. It should be considered as basic care instead of an additional task, which is voluntary to execute if the health care professional has time. For successful implementing CLIs in the future, a more positive attitude of all stakeholders towards CLIs is essential and it should not be without obligations for the health care professionals to offer CLIs to their patients.

A HPFI is an instrument that is not used commonly yet and the health care professionals in our study were somewhat skeptical about the effectiveness. In order to motivate health care professionals who are involved in the execution of a CLI to have a positive attitude towards an HPFI it might be helpful get more insight how health care professionals and the participants of the CLI can be more directly involved in the process of designing a HPFI.

Abbreviations

CLI: combined lifestyle intervention
CVD: cardiovascular disease
GP: general practitioner
DM2: diabetes mellitus type 2
HPFI: health promoting financial incentive

Declarations

Ethics approval and consent to participate

The research proposal was reviewed and approved by the Ethical Review Board of the Tilburg University before executing the study. Before the start of the interview, respondents signed a written informed consent, agreeing to participate in the study and to the audio recording of the interview.

Consent for publication

Not applicable

Availability of data and material

In the agreement with the consortium it was stated that data used and/or analysed during the current study are available from the corresponding author on reasonable request. The data will nog be shared on an open data source, because the transcripts were written in Dutch, which makes them available only for Dutch speaking researchers. Moreover, the transcripts do contain information that makes it possible to reduce the data to specific persons, which is not desirable.

Competing interests

The authors declare that they have no competing interests.

Funding

This research was supported by ZonMw. ZonMw is the Dutch national organization for health research and healthcare innovation.

Authors' contributions

GCW, CM, AS and LvdG were responsible for the design of the study. CM and StS were responsible for the data collection. CM, StS, GWV were responsible for the analysis of the data. CM has written the main part of the manuscript. LvdG, GWV and AS contributed with essential improvements in the manuscript. All authors critically reviewed the manuscript, and read and approved the final manuscript.

Acknowledgements

We would like to thank Tim de Vuijst for all the effort he put in to recruit participants for the study and conducting the interviews.

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Appendix 1 Interview guides

Interview guide for health care providers of the care group that participated in the original research

1. What was your role in the implementation process of the combined lifestyle intervention (CLI)?
2. In your opinion, were there barriers or facilitators for the implementation of the CLI? If yes, which one?
3. What was your attitude towards implementing a CLI in the region of the care group?
4. How did you experience the implementation of the CLI? What factors contributed that you experienced it this way?
5. In your opinion, what was the attitude of the care providers concerned to the GLI?
6. Were there differences between the different groups of care providers with regard to their attitude towards the GLI? And if so, which ones?
7. How was the attitude of the health care insurers towards the implementation of a CLI according to you?
8. What do you think are preconditions for a successful implementation of the CLI?
9. To what extent has adding a financial incentive to the CLI, influenced the implementation process of the CLI according to you?
10. What was your attitude towards the financial incentive that was added to the CLI?
11. What do you consider the attitude of the (other) healthcare providers to the financial incentive?
12. The financial incentive intended to motivate participants to participate in and to finish the CLI. Do you think that this specific financial incentive could indeed achieve this?
13. What should be the design of a financial incentive to be effective in your opinion?
14. The intake of participants in the CLI did not go as expected. What do you think are reasons that participation rates fell short of expectations?
15. The CLI was implemented in your care group, but did not succeed. What lessons can be learned from the implementation process of the?
16. What lessons can be learned from the implementation process of the financial incentive?
17. The intake of participants in the CLI did not go as expected. In the future, what do you expect from the supply and demand for lifestyle interventions for physical activity and healthy eating?
18. What do you expect in the future of providing financial incentives for lifestyle interventions on physical activity and healthy eating?
19. Do you expect financial incentives to be used more often in lifestyle interventions on physical activity and healthy eating?

20. What do you expect is the effect to implement lifestyle interventions around physical activity and healthy eating?

Interview guide for health care providers of care groups not participating in the original research

1. What is your position in your organization?
2. Are there currently lifestyle interventions implemented in your care group aiming to improve physical activity levels of the participant and healthy eating. What is the design of these lifestyle interventions?
3. What factors have promoted the implementation of lifestyle interventions for physical activity and healthy eating in your region?
4. What factors have hampered the implementation of lifestyle interventions for physical activity and healthy eating in your region?
5. In your opinion, what are the factors that hamper or promote the implementation of lifestyle interventions for physical activity and healthy eating?
6. How do you feel about the implementation of lifestyle interventions in your region?
7. What is the attitude of other care providers regarding the implementation of lifestyle interventions on physical activity and healthy eating?
8. Are there differences between the different groups of care providers with regard to their attitude towards lifestyle interventions concerning physical activity and healthy eating? And if so, which ones?
9. What is, according to you, the attitude of health insurers to the implementation of lifestyle interventions regarding physical activity and healthy eating? What do you think of this attitude?
10. What do you think are preconditions for a successful implementation of lifestyle interventions on physical activity and healthy eating?

Before asking following questions, the interviewers give an explanation about the concept 'financial incentive'

11. To what extent do you think that adding a financial incentive for the participants of the lifestyle intervention influences the implementation of lifestyle interventions on physical activity and healthy eating?
12. To what extent do you think that adding a financial incentive to the participants can influence the participation rates or the effectiveness of a lifestyle intervention on physical activity and healthy eating?
13. What is your attitude towards adding a financial incentive to a lifestyle intervention on physical activity and healthy eating?

14. What is, according to you, the attitude of (other) caregivers towards the use of a financial incentive for the participants of the lifestyle intervention?
15. To what extent do you think that the use of a financial incentive can be effective?
16. What should be characteristics of a financial incentive to be effective in your opinion?
17. In the future, what do you expect from the supply and demand for lifestyle interventions for physical activity and healthy eating?
18. What do you expect in the future of providing financial incentives for lifestyle interventions on physical activity and healthy eating?
19. Do you expect financial incentives to be used more often in lifestyle interventions on physical activity and healthy eating?
20. What do you expect is the effect to implement lifestyle interventions around physical activity and healthy eating?

Interview guide for community health services policy staff

1. What is the role of the community health service regarding the implementation of lifestyle interventions on physical activity and healthy eating?
2. What is your position in your organization?
3. Are there currently lifestyle interventions implemented in your region aiming to improve physical activity levels of the participant and healthy eating. What is the design of these lifestyle interventions?
4. What factors have promoted the implementation of lifestyle interventions for physical activity and healthy eating in your region?
5. What factors have hampered the implementation of lifestyle interventions for physical activity and healthy eating in your region?
6. Could the community health service have had a role in order to remove this barrier? If so what, if not why not?
7. In your opinion, what are the factors that hamper or promote the implementation of lifestyle interventions for physical activity and healthy eating?
8. How do you feel about the implementation of lifestyle interventions in your region?
9. What is the attitude of other care providers regarding the implementation of lifestyle interventions on physical activity and healthy eating?
10. Are there differences between the different groups of care providers with regard to their attitude towards lifestyle interventions concerning physical activity and healthy eating? And if so, which ones?
11. What is, according to you, the attitude of health insurers to the implementation of lifestyle interventions regarding physical activity and healthy eating? What do you think of this attitude?

12. What do you think are preconditions for a successful implementation of lifestyle interventions on physical activity and healthy eating?
13. To what extent do you think that adding a financial incentive for the participants of the lifestyle intervention influences the implementation of lifestyle interventions on physical activity and healthy eating?
14. To what extent do you think that adding a financial incentive to the participants can influence the participation rates or the effectiveness of a lifestyle intervention on physical activity and healthy eating?
15. What is your attitude towards adding a financial incentive to a lifestyle intervention on physical activity and healthy eating?
16. What is, according to you, the attitude of (other) caregivers towards the use of a financial incentive for the participants of the lifestyle intervention?
17. To what extent do you think that the use of a financial incentive can be effective?
18. What should be characteristics of a financial incentive to be effective in your opinion?
19. In the future, what do you expect from the supply and demand for lifestyle interventions on physical activity and healthy eating?
20. What do you expect in the future that the role of the community health service can be in the implementation process of lifestyle interventions on physical activity and healthy eating?
21. What do you expect in the future of providing financial incentives for lifestyle interventions on physical activity and healthy eating?
22. Do you expect financial incentives to be used more often in lifestyle interventions on physical activity and healthy eating? Followed by asking why yes or no
23. What do you expect is the effect to implement lifestyle interventions around physical activity and healthy eating?

Appendix 2 Coding tree

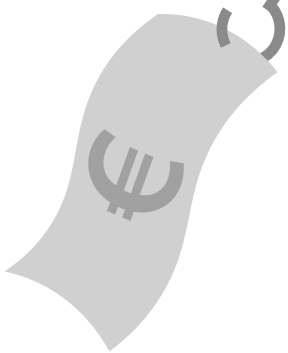
Lifestyle intervention	Attitude interviewee	Future financial incentive added to lifestyle intervention
		Future lifestyle interventions
		Division of tasks
		Out of pocket costs
	Characteristics	Long term
		Awareness
		Own initiative after completing CLI
		Building intrinsic motivation
	Facilitators implementation	Willingness health care insurer
		Attitude patient
		Publicity
		Funding
		Leader
		Enthusiastic health care professionals
		Willingness health care providers
		Mandatory participation
		Long-term vision
		Health care professionals interested in CLI
		Vision of health care providers on their tasks
		Chain cooperation
		Early referral
		Recruitment strategy
		Allocation of tasks
	Barriers implementation	No inflow patients
		Attitude patient
		Complexity
		Funding
		Lack of time
		Willingness health care providers
		Contact with general practitioners
		Willingness of municipalities
		Publicity
		Short-term vision
		Hard to reach target group
		Vision health care professionals

	Preconditions implementation	Enthusiasm
		Fitting the needs of the target group
		Funding
		Well considered content
		Long-term vision
		Recruitment strategy
Willingness to participate in lifestyle intervention	Facilitating characteristics participants	Enthusiasm
		Motivation
		Be open to new ideas
		Having insight
	Hampering characteristics participants	Loneliness
		Having no insight
		Laziness
		Behavioral change is difficult
		Personal problems
		No experience/no knowledge
		Low health literacy/speaking a foreign language
	Facilitating factors lifestyle intervention	Fits needs of the target group
		Continuity
		Social aspect
		Social support
		Set targets
		Out of pocket costs
		Close to home
		Easy accessible
		Available for everyone
		Group/individual program
		Low threshold
		Presence health care professional
		Presence social map
		Presence care sport connectors
		Recruitment strategy
	Hampering characteristics lifestyle intervention	Out of pocket costs
		Not close to home
		No continuity
		Group/individual program

Financial incentive	Characteristics	Provider
		Attitude health care professionals
		Positive incentive
		Negative incentive
		Gamification
	Effect	Motivation
		Lowering threshold
		Giving insight
		Long-term
		Short-term

Chapter 5

Do physical activity patterns influence preferences for the characteristics of a lifestyle program for diabetes patients?



Molema, C.C.M., Veldwijk J., Wendel-Vos G.C.W., de Wit G.A., Schuit A.J. & van de Goor, L.A.M. (2019).

Do physical activity patterns influence preferences for the characteristics of a lifestyle program for diabetes patients? (submitted)

Abstract

Introduction: The aim of the study was to investigate if initially active diabetes type 2 (DM2) patients have a different preference than inactive DM2 patients for the characteristics of a combined lifestyle intervention (CLI) such as the use of a financial incentive, using a discrete choice experiment (DCE).

Methods: A DCE questionnaire was completed by 206 participants with DM2 (response rate 26.9%). Latent class analyses were conducted and a three-class model appeared most appropriate for our data. Latent class models account for the multilevel structure of the data. Relative importance scores of the attributes were calculated for all three classes.

Results: Baseline physical activity levels contributed to the class assignment. Preferences with regard to a financial incentive and other characteristics of a CLI varied between DM2 patients who initially complied to the Dutch physical activity guideline and those who did not comply to the Dutch physical activity guideline. Patients who were more likely to comply with the Dutch physical activity guideline, did not prefer to receive a reward for participating in a CLI.

Discussion and conclusion: DM2 patients who adhere to physical activity guidelines have different preferences for financial incentives and other characteristics of a CLI than patients who have a more sedentary lifestyle. This shows the necessity to implement CLI programs in a tailored manner. A financial reward may be a decisive attribute for patients who currently are inactive and might increase participation rates if the reward fulfills the requirements of the target group.

Keywords: diabetes, discrete choice experiment, financial incentive, physical activity, preferences

Introduction

The prevalence of diabetes type 2 (DM2) is rising worldwide [1, 2]. Physical inactivity and overweight are among the major risk factors for developing DM2, but also for the course of the disease [3-5]. Therefore, combined lifestyle interventions (CLIs) are being implemented in various countries in order to support this group of patients to change their lifestyle. The intervention programs tend to show large variety in content [6] and usually target a combination of physical activity behavior and eating habits. Achieving high participation and compliance rates in CLIs has proven to be challenging [7-10]. A positive relation may be expected between the extent to which a CLI appeals to the target population and the willingness to participate. Previous studies suggested that incentives are effective in stimulating participation rates of and adherence to physical activity programs [11-13]. A closer look at studies that investigated the effectiveness of financial incentives added to a CLI showed that only a few studies used an adequate study design including a separate arm investigating the independent effect of a financial incentive on behavioral change. Therefore, no conclusive evidence with regard to the effectiveness of financial incentives in CLIs is available at present [14]. Patients who are already physically active might prefer a more intensive program and might be less susceptible to financial incentives, because they are intrinsically motivated. Inactive patients might prefer an easy accessible and less intensive CLI. Finally, compared to patients already adhering to physical activity guidelines, we expect that patients who do not comply with this guideline are more susceptible to receiving a reward, because an extrinsic motivation may help to overcome initial barriers to participate and change their habits.

In contrast to the findings that financial incentives might stimulate participation rates and program adherence, the study of Wanders et al. showed that a financial reward might result in a decrease in willingness to participate in a lifestyle program [15]. As a result of the unusual findings of the study of Wanders et al. we hypothesized that their findings at group level might differ for subgroups who were initially more and less physical active. Therefore, in the current study, we have investigated if there are differences in preferences between initially active and inactive DM2 patients for the characteristics of a CLI, such as the use of a financial incentive, using the data of a discrete choice experiment (DCE) of Wanders et al. [15].

Methods

Participants and recruitment

This study shows the results of secondary analyses within the same population as described in the paper of Wanders et al. [15].

The study population consisted of patients with diabetes type 2 (DM2 patients) selected from a geographical defined area in the Netherlands (De Leidsche Rijn, Utrecht). Patients were eligible if they were treated for their DM2 primarily in primary care and were excluded if they were terminally ill and/or had mental health problems (based on information in their medical records). Participants were asked to complete a questionnaire. Based on the guidelines of the Central Committee on Research Involving Human Subjects no formal testing by a medical ethical committee was required for a once only survey.

The DCE questionnaire was sent by the health care center to 767 patients via conventional mail. After three weeks, a reminder was sent by the health care center. Patients who completed the questionnaire received a voucher of 7.50 euro. The data were anonymized for the researchers.

Discrete choice experiment

The DCE methodology is based on the Random Utility Theory, which assumes that any intervention can be described by its characteristics (e.g. health outcome, costs, and number of appointments). These characteristics (i.e. attributes) have levels on which the individual's preference for an intervention is dependent [16, 17].

Insight in the components of an intervention that contribute most to the willingness to participate in an intervention is crucial for the design of interventions in public health and health care. DCEs are used increasingly both in public health and health care [16-19].

In a study of Veldwijk et al. relevant attributes and levels for the current study were identified [20]. In their study, a literature review was performed, experts were interviewed and focus groups with DM2 patients were conducted. This way it was ensured that the most important attributes and levels for the decision-making process of DM2 patients were included in the DCE. More detailed information on the study by Veldwijk et al. can be found in the paper of Veldwijk et al. [20] and more detailed information on the specific study in the geographical region of the Leidsche Rijn can be found in the paper of Wanders et al. [15]. Ultimately, five attributes each containing three levels were selected (Table 1). A more detailed description of the attributes and levels in this DCE can be found in Appendix 1.

Respondents were asked to choose the most preferred scenario out of three scenarios that were presented simultaneously to them (i.e. choice tasks). Two of these choice tasks contained descriptions of CLI, and the third choice was an opt-out, because not participating in a CLI is a realistic choice for at least part of these patients. The two CLI choice tasks were

constructed by varying levels of the attributes. Each respondent was asked to complete a series of 9 choice tasks. Based on the choices the respondents made, conclusions can be drawn on the components that constitute an intervention or treatment that is most preferred.

Table 1. Attributes and levels included in the DCE

Attribute	Levels
Menu schedule	Flexible (ref)
	General
	Elaborate
Physical activity schedule	Flexible (ref)
	General
	Elaborate
Consult structure	Individual (ref)
	In a group with 5 other participants of the CLI
	In a group with 10 other participants of the CLI
Expected outcome	No weight loss but feeling more fit
	Weight loss of 5 kilograms and feeling more fit
	Weight loss of 10 kilograms and feeling more fit
Reward	Financial reward of 75 euro for 3–6 months participation
	Financial reward of 150 euro for 3–6 months participation
	Financial reward of 225 euro for 3-–6 months participation

Experimental design and questionnaire

An efficient design was constructed by using N-Gene (ChoiceMetrics, 2011) software. In this D-efficient design, level balance and minimal overlap between attribute levels were optimized. It was assumed that there was no interaction between attributes.

Prior to the choice tasks, an extensive explanation on the different attributes and levels was offered to the respondents. They also received an instruction how to answer the choice tasks, accompanied by an example. Every choice task started with the question: 'Imagine that your general practitioner or nurse practitioner advises you to participate in a lifestyle program for a period of 3–6 months. In which situation would you prefer to participate, situation 1 or situation 2? If you do not want to participate in either of the situations, you can tick the box "none'' (opt-out).

The final questionnaire consisted of two parts. Part one included questions related amongst others to physical activity. The physical activity level was composed of three types of activities: 1) walking or cycling for commuting purposes; 2) sports; and 3) other leisure time activities

(walking, cycling, gardening and doing chores). For every type of activity we calculated the number of days per week people were physically active for at least 30 minutes from the responses of patients. For the physical activity level we added up the number of days of the three components. If this resulted in five days or more per week of being physically active, the respondent was categorized as 'adhering to the Dutch physical activity guideline [21] and therefore as 'active' respondent. If not, the respondent was categorized as 'inactive'. Moreover, questions were included related to the attitude of the respondents towards a CLI in general and willingness to participate in a CLI. Data with regard to the patients' age and gender were retrieved from their Electronic Medical Records by the GP and were added to the research database by staff of the health care center. Part two of the questionnaire consisted of the actual DCE choice tasks.

Statistical analysis

All attributes were recoded using effect codes. In this procedure, the reference category is coded as '1' and the sum of the effect coded attribute levels is always zero. Latent class analysis was performed (using NLogit 5.0 software). Latent class models are characterized by the fact that they account for the multilevel structure of the data and that they allow for the investigation of the presence of unobserved subgroups (i.e. 'classes') within the population that differ in their preferences with regard to the attributes of a lifestyle intervention (i.e. preference heterogeneity). The classes within the data are based on answering patterns of the respondents, class assignment follows from the analysis and is not assigned by the researchers. Each respondent has a certain probability to belong to one of the identified classes. Based on model fit tests, a three-class model using the utility equation shown below was most suitable for our data.

$$U = V + \varepsilon = \beta_0 + \beta_1 * \text{flexible menu schedule} + \beta_2 * \text{elaborate menu schedule} + \beta_3 * \text{flexible PA schedule} + \beta_4 * \text{elaborate PA schedule} + \beta_5 * \text{consulation in group of 5} + \beta_6 * \text{consultation in group of 10} + \beta_7 * \text{expected outcome} + \beta_8 * \text{reward} + \varepsilon$$

U represents the utility of a lifestyle program. *V* represents the measurable utility of a specific scenario (lifestyle program) based on the attributes that were included in that scenario. β_0 represents the alternative specific constant, β_1-β_8 represent the attribute estimates that indicate the relative importance of each attribute. The ε term corresponds with the unmeasured variation in preferences.

After fitting the utility function as presented above, a class assignment model was fitted. Physical activity level of the participants was tested for a significant contribution to the class assignment model. The final class assignment utility function was:

$V = \beta_0 + \beta_1$ *physical activity level*

A significant estimate in this function indicates that the variable 'physical activity level' (complying to the Dutch physical activity guideline) contributed to the class assignment; e.g. if the estimate of reaching the Dutch physical activity guidelines is positive and significant for class 1, respondents who reach the Dutch physical activity guideline were more likely to belong to class 1.
The physical activity level was calculated as a dichotomous variable (0= not complying to the Dutch physical activity guideline; 1= complying to the Dutch physical activity guideline, as described above).

Relative importance scores
The relative importance scores provided information with regard to the characteristics of the CLI that were most important in deciding whether or not to participate in the program. The relative importance of the attributes was estimated separately for the three classes of the latent class model. For each attribute, the difference between the highest and lowest attribute level estimate was calculated. All difference values were divided by the highest difference value. Therefore, the highest importance score is 1 and this is the most important attribute. This resulted in the relative distance of all attributes to the most important attribute on a scale of 0–1.

Results

In total 206 participants (response rate 26.9%) returned the questionnaire and 202 participants were included for the analysis due to incomplete data of four persons. The average age was 67.5 years and 52.5% of the respondents were male. The general opinion about CLIs was neutral to positive. A small majority of the respondents had the intention to participate in a CLI. Only 6.1% had ever participated in a CLI.

Table 2. Baseline characteristics (N=202*)

	Mean (SD)	Percentage
Age (years)	67.5 (11.5)	
Gender (male)		52.5
General opinion about lifestyle programs		
Very useful		14.8
Useful		33.7
Neutral		45.4
Not so useful		2.0
Not so useful at all		4.1
Intention to participate in a lifestyle program		
Certainly not		20.9
Probably not		34.3
I do not know		19.4
Probably		14.9
Certainly		10.4
Ever participated in a lifestyle program (yes)		6.1
Adhering to the Dutch physical activity guideline		41.6

* Number of respondents varied between 196 to 201 due to missing data.

Three classes were identified in the latent class model. The average class probabilities are presented in Table 3 (lower panel). An individual has a chance of 42% to belong to class 1, 29% to class 2 and a chance of 29% to belong to class 3. Respondents who complied with the Dutch physical activity guideline had a higher probability to belong to class 1. When adding all three components of physical activity separately in the latent class model, analysis showed that only one component, “leisure time walking, cycling, gardening and doing chores” explained the effect of the physical activity level on class assignment (results not shown).

Patients in class 1 were less willing to participate in a CLI when the monetary value of the reward increased (coefficient -1.78) (Table 3). Additionally, these patients preferred an elaborate menu schedule to other types of menu schedules and willingness to participate decreased if the expected outcome in terms of amount of weight loss increased (coefficient -0.45) (Table 3).

In class 2, the attributes ‘outcome’ and ‘reward’ contributed significantly to the decision about participating in a CLI of patients (Table 3). The attribute ‘reward’ was the most decisive characteristic in the choice for a CLI (Figure 1). The higher the monetary value of the reward that was offered, the lower was the willingness to participate in the CLI (coefficient -0.81, Table 3). The willingness of patients in class 2 to participate in the CLI increased when the

amount of weight loss as expected outcome increased (coefficient 'expected outcome' 0.09) (Table 3).

In class 3, the attribute 'reward' did not have much influence on the decision to participate in a CLI for these patients (Figure 1). The patients in class 3 preferred not to participate in a CLI (constant -1.46) (Table 3). However, their willingness to participate increased when the amount of weight loss increased as expected outcome. Respondents in class 3 preferred an elaborate physical activity schedule to the other types of physical activity schedule (coefficient 0.55) (Table 3). An elaborate menu schedule was not preferred by the respondents in class 3 (coefficient -1.09) (Table 3). 'Physical activity schedule' and 'expected outcome' were the most decisive characteristics in the choice for participating in a CLI (Figure 1).

Table 3. Preferences for a CLI for diabetes type 2 patients based on latent class analysis

Estimate		**Class 1**			**Class 2**			**Class 3**		
		Estimate	**SE**	**RI**	**Estimate**	**SE**	**RI**	**Estimate**	**SE**	**RI**
Constant		0.05	1.55		-0.24	0.57		-1.46*	0.83	
Menu schedule	Flexible	0.70	0.75	2	0.08	0.20	3	0.67	0.46	4
	General	-1.69*	0.92		0.15	0.19		0.42	0.28	
	Elaborate	0.99*	0.58		-0.23	0.21		-1.09*	0.64	
Physical activity schedule	Flexible	0.26	1.60	5	0.34	0.23	4	1.06**	0.45	1
	General	-1.52	2.06		-0.03	0.22		-1.61**	0.68	
	Elaborate	1.26	1.14		-0.31	0.24		0.55***	0.21	
Consult structure	Individual	1.29	1.63	1	0.36	0.23	5	-0.33	0.57	5
	Group with 5 others	0.44	1.12		0.03	0.22		-0.76	0.50	
	Group with 10 others	-1.73	2.15		-0.38	0.24		1.09*	0.64	
Expected outcome		-0.45**	0.21	3	0.09**	0.04	2	0.36***	0.08	2
Reward		-1.78**	0.88	4	-0.81***	0.27	1	0.58	0.36	3
Class probability model										
Constant		0.05	0.32		-0.19	0.36		–	–	
Physical activity level		1.75*	1.04		1.29	1.18		–	–	
Average class probability		0.423			0.291			0.286		

* 10% CI; ** 5% CI; *** 1% CI; RI is the ranking of the attribute based on the relative importance score; SE= Standard Error

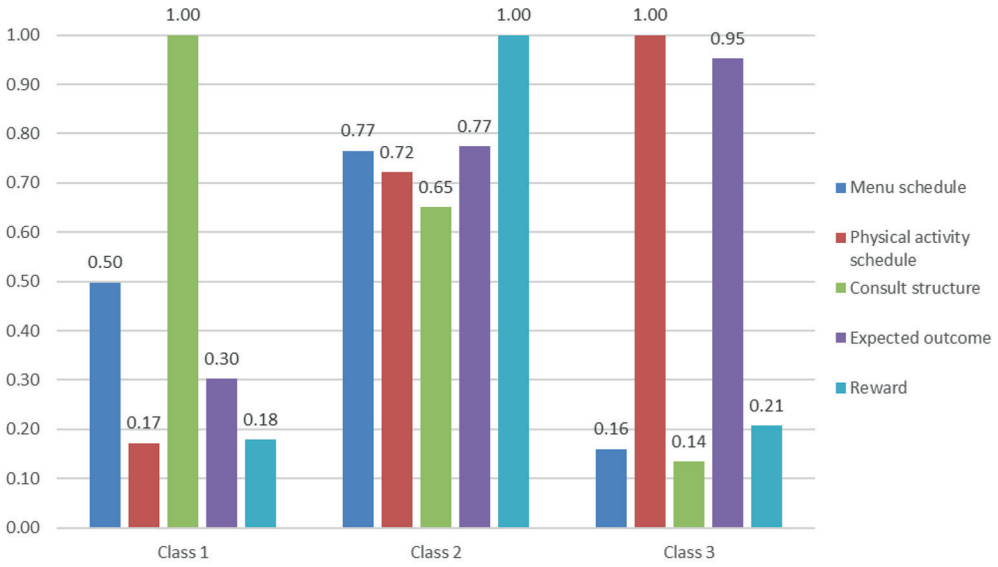


Figure 1. Relative importance scores of the attributes presented per class

Discussion

In this study, the preferences for receiving a financial reward and other characteristics of a CLI of DM2 patients who were initially active (41.6%) and inactive (58.4%) were investigated. Three groups with a different preference structure were identified among DM2 patients. Preferences and relative importance scores of the characteristics of the lifestyle program differed between the three identified classes in the data identified by a latent class model. Patients who were more likely to initially comply with the Dutch physical activity guideline reported a negative attitude towards receiving a reward. Moreover, for patients in this group the consult structure is the most important characteristic for their decision to participate in a lifestyle program, while for patients in the other groups it is the least important characteristic in their decision to participate. For the patients in class 2 who were less likely to comply with the Dutch physical activity guideline, receiving a reward was the most important characteristic for their decision to participate. The patients in group 3 did not prefer to participate in a CLI at all and a reward did not have much influence on the decision whether to participate in a CLI. The results of the study imply that in offering CLIs we should consider differences between groups who are already physically active and probably intrinsically motivated and those who are not, In the design of a CLI, it should be considered to leave room for personal preferences of eligible participants towards a CLI and create a more tailored CLI for every participant.

Evidence with regard to the effectiveness of financial incentives for improving health behavior is not univocal [14]. Based on the results of this DCE we may conclude that a reward is counterproductive for participation rates in a CLI for specific subgroups.

Financial incentives are a much-debated instrument to increase the attractiveness of a CLI [12, 13, 22, 23]. On the one hand, it can be beneficial because an extrinsic motivation such as a financial reward may either lower the threshold for patients to participate in a CLI or motivate to adhere in a CLI. On the other hand, the temporarily extrinsic motivation in the form of a financial incentive might crowd out the intrinsic motivation. A potential consequence might be that if the financial incentive (extrinsic motivation) is removed, no intrinsic motivation is left and the physical activity level of the participants decreases. The financial reward is then counterproductive, because on the long term the intrinsic motivation is lower after the intervention than before. However, no evidence has been found yet for this so called crowding out effect [24, 25].

In our study, no information was given to the respondents on the effectiveness of the reward, which might create the aversion towards the financial incentive as seen in the studies of Giles et al. [26, 27]. Providing information towards the effectiveness of an incentive might stimulate a more positive attitude towards financial incentives in eligible participants [26, 27]. However, effectiveness of a financial incentive is mostly unknown on forehand and is in itself dependent on actions of the individual that will receive the reward, so this information is not available when the incentive is implemented.

In this study there was no data available on the weight of the patients at baseline. This data could have helped to explain the result that patients who were more likely to initially comply with the Dutch physical activity guideline preferred an elaborate menu schedule. But on the other hand, willingness to participate decreased if the expected outcome in terms of amount of weight loss increased. This might indicate that these patients do not have much overweight.A later study by our group that investigated the preferences for financial incentives, showed that prerequisites (patients had to stick to certain conditions) for receiving the financial incentive was the most decisive characteristic for a financial incentive [28].

Prerequisites for receiving the incentive on for example attendance rate or results the participants gain, might positively influence the effectiveness of a financial incentive [28]. Since information on the effectiveness of the financial incentive as such is not available, formulating prerequisites for receiving the financial incentive might help increasing acceptance of financial incentives by the general public.

However, one should be cautious about providing rewards to specific groups, since ethical issues may rise when some participants within a population will receive a reward and others will not [29]. For example, the study of Giles et al. found that financial rewards were seen as unfair by the general public, because previous unhealthy behavior was rewarded. Individuals

with a healthy lifestyle are not eligible to participate and as a consequence not eligible to receive a reward [27].

Discrete choice experiments are becoming more widely used in health care. Despite all interesting results that this technique reveals, some awareness with regard to the results is necessary. People who fill out the DCE questionnaire make a hypothetical choice. The decision they make on paper might differ from the decision they would make in real life, because a hypothetical choice has not the same financial, clinical, behavioral or emotional consequences in their life than an actual decision in real life. However, the positive predictive value was previously shown to be quite high (0.8) [30, 31].

This study showed differences in preferences for a CLI between DM2 patients which can partly be explained by whether or not adhering to guidelines for physical activity at baseline. Tailored interventions show promising results, but more research is necessary [32, 33]. Tailored interventions might increase participation rates and program adherence. Nevertheless, we acknowledge that in practice tailoring may only be feasible to a certain extent. Despite the potential of tailoring, it might not be the ultimate solution. It will still remain difficult to convince inactive people to participate in a CLI just because it meets their preferences in principle. Behavioral change remains complicated and challenging. Factors as skills of the general practitioner in motivational interviewing and the social environment of the patient also influence the motivation of the patient whether or not to participate in a CLI and the motivation to finish the CLI.

The target group for a CLI mostly consists of chronically ill patients, with a possible relationship between their illness and their inactive lifestyle. Offering an intervention like a CLI at the stage of being already chronically ill for some time is rather late in the process. It would therefore be recommendable to offer an intervention like a CLI in an earlier stage to prevent that these people become chronically ill. This indeed stimulated CLI's to become reimbursed by the basic health insurance in the Netherlands, starting January 1st, 2019. In addition, reasons why some people are inactive or not willing to participate should be discovered in more detail to be able to understand their actions. This might also help to increase participation rates of CLIs that acknowledge the factors for becoming inactive.

Conclusion

Preferences with regard to a financial incentive and other characteristics of a lifestyle program varied between DM2 patients who were already active and complied with the Dutch physical activity guideline and DM2 patients who were inactive. Characteristics of the CLI that are decisive for the decision to participate or not, differed between the identified subgroups. A financial reward may be a decisive attribute for patients who are currently inactive, which suggest that a financial incentive that better fits the preferences of the target group might

improve participation rates of the lifestyle program. A tailored approach for implementing CLIs seems to be most effective, one should be aware that 'one size fits all' might not be the best practical approach for implementing a lifestyle program for DM2 patients.

Acknowledgements
We would like to thank Bertien Hart and Karolien van den Brekel from the Leidsche Rijn Julius Healthcare center for their help in the data collection.

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Appendix 1

Elaborate description of the attributes and levels of the attributes of the DCE.

Meal plan

A plan, which describes the aim of the participants with respect to improvements in their diets.

1. Flexible: participants choose their own goals and prepare a meal plan themselves.
2. General: lifestyle coach provides general information on a healthy diet and example recipes.
3. Elaborate: a patient tailored menu plan prepared by a lifestyle coach.

Physical activity (PA) schedule

A plan, which describes the aim of the participants with respect to improvements in their PA behavior, developed by the participants together with a lifestyle coach.

1. Flexible: participants choose their own goals and prepare a PA plan themselves.
2. General: lifestyle coach provides general information on PA and example exercises.
3. Elaborate: a patient tailored PA schedule prepared by a lifestyle coach.

Consultation structure

The composition of the consults with the lifestyle coach.

1. Individually.
2. In a group with 5 other participants of the CLI.
3. In a group with 10 other participants of the CLI.

Expected outcomes

The results as expected by the respondents after finishing the CLI in terms of weight loss & physical fitness.

1. No weight loss but feeling more fit.
2. 5 kilograms weight loss and feeling more fit.
3. 10 kilograms weight loss and feeling more fit.

Reward

Amount of money patients could earn by finishing the CLI.

1. Financial reward of 75 euro for 3-6 months participation
2. Financial reward of 150 euro for 3-6 months participation
3. Financial reward of 225 euro for 3-6 months participation.

Chapter 6

Attitude towards using financial incentives to promote participation in a combined lifestyle intervention in the Netherlands. A focus group study

Molema, C.C.M., Wendel-Vos G.C.W., van de Goor, L.A.M & Schuit A.J. (2019).

Attitude towards using financial incentives to promote participation in a combined lifestyle intervention in the Netherlands. A focus group study. (submitted)

Abstract

Background: The aim of this qualitative study was to gain first insights in the attitude towards using a health promoting financial incentive (HPFI) to stimulate participation in and adherence to a combined lifestyle intervention (CLI) among both the general public and eligible participants of such an intervention. In addition, preferred characteristics of a CLI according to the respondents were mapped.

Methods: Three subpopulations were included: the general public, individuals at high risk for a chronic disease, and individuals already diagnosed with a chronic disease. Nine focus groups were performed; three for each sub population. Findings were analyzed using the program MAXQDA and were coded by two independent researchers.

Results: A substantial part of the respondents believed that positive HPFIs (i.e. a reward or discount could be effective and that they were acceptable. Negative HPFIs (i.e. a fine) were found acceptable by only a smaller part of the respondents. These HPFIs were not expected to be effective because the inflow of participants in the intervention was expected to remain low. In the general public and the groups representing eligible participants for a CLI similar attitudes were found towards implementing HPFIs.

Discussion and conclusion: Positive HPFIs were considered acceptable and potentially effective by part of the respondents. Negative HPFIs were acceptable by a smaller part of the respondents, but the opinion towards implementing these HPFIs in practice were negative. Diverse attitudes towards using HPFIs to stimulate compliance of a CLI were found in all populations and no clear differences with regard to the attitude towards HPFIs between the eligible populations could be found.

Keywords: Financial incentive, prevention, combined lifestyle intervention, qualitative research, focus group.

Introduction

Financial incentives to promote healthy behavior are increasingly used by government and corporations in order to reduce the number of chronic diseases and hence restrain the rising health care costs, even though the effectiveness is still under study [1-4]. At the same time, the public opinion on using health promoting financial incentives (HPFIs) is not univocal. About half of the respondents participating in studies addressing various health behaviors (e.g. smoking, exercise, medication use) have a positive attitude towards the use of HPFIs whereas the other half has not [5-10].

Increased obesity rates and decreased physical activity levels are strongly associated with prevalence and incidence of diabetes mellitus type 2 and cardiovascular disease [11-13]. In the Netherlands, a combined lifestyle intervention (CLI) that aims to improve both exercise levels and eating habits is considered an effective strategy to combat chronic disease in high-risk groups or to prevent worsening of the chronic disease [12, 14].

To this end, in 2019 CLIs will be reimbursed by the general health insurance if they fulfill certain criteria, such as that individuals are motivated to change their health behavior and have low physical activity levels. However, participation rates and treatment adherence remain often low in CLIs [15, 16]. Using a HPFI might increase participation rates and adherence to these programs. A Canadian study showed that half of the participating cardiac rehabilitation patients disagreed with implementing an HPFI for exercising, because they felt it was unfair, a waste of limited resources and unnecessary. However, if the incentive was voucher-based, large enough to motivate healthy behavior, meaningful and not funded by the government, the overall attitude towards the HPFI was more positive [5]. Attitudes and opinions may be different between eligible target populations and the general public. For example, the study of Bonevski et al. showed that using HPFI to stimulate smoking cessation was more accepted by smokers than non-smokers [6].

As far as we know, no study has been performed yet in the Netherlands to increase insight into the opinion of the general public and people eligible for CLI participation with regard to HPFIs to stimulate CLI participation. This is important to know because it might be expected that adding a HPFI to a CLI only works if there is broad support and acceptance among target populations. A potential effective and acceptable HPFI has to meet the preferences of the target group. Also the general population has an influence on the acceptance and effectiveness of the HPFI. If HPFIs are added to a CLI and the general population has a negative attitude, ethical discussions will rise and lack of social support might prevent successful implementation of the HPFI.

The aim of this qualitative study was to gain first insights in the attitude of both the general public and individuals eligible to participate with regard to using a HPFI to stimulate

participation in and adherence to a CLI. In addition, characteristics of a HPFI preferred by respondents were investigated.

Methods

Design and procedures

To investigate the attitude towards HPFIs of the general public and individuals eligible to participate in a CLI), a qualitative research design was used. In total, nine focus groups were performed. Three subpopulations were included and for every subpopulation, three focus groups were performed. The study proposal was reviewed and approved by the Ethical Review Board of the Tilburg University.

Focus group participants and recruitment

Focus group participants were recruited and selected by a recruitment company. Eight participants per focus group were recruited and two more people were placed standby to replace participants who did not show up. Only people aged 40 or over were considered eligible and if possible, an equal ratio male and female was aimed for.

The first subpopulation was designed to be a representation of the general population of the Netherlands. The second subpopulation consisted of individuals at high risk to develop a chronic disease such as type 2 diabetes or cardiovascular disease. We defined high risk as having a low social economic status and a body mass index (BMI) above 30 kg/m^2. The last subpopulation consisted of patients that were already diagnosed with diabetes type 2 and/ or cardiovascular disease. The last two subpopulations are eligible to participate in a CLI, so their attitude and preferences towards a HPFI are of major importance.

Each participant received an information letter and they all signed an informed consent. By signing the informed consent, the participant agreed to participate in the study and to the video recording of the focus group.

Data collection

Nine focus group interviews were performed with in total 69 participants (Appendix 1). Eight focus groups had 8 participants and one focus group had 5 participants. The focus groups were performed in a room with a video circuit. The moderator of the focus groups was externally recruited and the principal researcher (CM) followed the focus groups via the video circuit in an adjacent room. Reason for this design was that we expected that HPFIs were a complicated topic for our participants and a highly skilled moderator was needed to retrieve as much information from the participants as possible. Moreover, this moderator did not have any connection with the research. This might make participants less prone to

give socially desirable answers or answers that they feel could help the researcher instead of giving their real opinion.
A semi-structured interview guide was used to perform the focus group interviews (Appendix 2). First, an association exercise was performed in which the participants were asked to write down their first thoughts with regard to a HPFI. The second part focused on their opinion towards implementation of HPFIs as addition to a CLI and preferred characteristics of HPFIs. The third part focused on their opinions on the *acceptability* of implementing HPFI as addition to a CLI.

Data analysis

All video recordings of the focus groups were transcribed verbatim by an external company and were checked by the principle researcher on accuracy (CM). MAXQDA 2018 was used to analyze the transcripts. Based on the semi-structured interview guide of the focus groups, a code tree was designed (Appendix 3). Two researchers (CM and JJ) independently coded the transcript of one of the focus groups. Differences between the coded transcripts of both researchers were discussed until consensus was reached. Codes were adapted if necessary and missing codes were added to the code tree. A second transcript was coded and checked in the same way as the first transcript, to confirm the completeness of the code tree and to determine if both researchers interpreted the codes in the same way. The other seven transcripts were coded by one researcher, and checked and if necessary adjusted and complemented by the other researcher. In a consensus meeting, all adjustments in codes and complementary codes were discussed by the two researchers. If no consensus was reached a third researcher (WWV) was consulted.

Presentation of the findings

First, the associations towards the concept of a HPFI that the focus group participants had at the start of the meeting are presented. By doing this, we were able to find out the current knowledge of the respondents towards HPFIs. Second, opinions with regard to implementing HPFIs to stimulate participation and adherence to a CLI are presented and preferred characteristics of both positive and negative HPFIs. Last, the acceptability of implementing a HPFI as addition to a CLI is discussed. Differences between the three subpopulations will be mentioned per topic if they were found. If no clear differences between the groups could be found, overall results will be presented.

Results

Basic knowledge of the respondents towards HPFIs

Almost all the respondents mentioned any form of positive HPFIs if they were asked 'What is the first thing that comes to your mind when you hear about a financial incentive?'. Respondents mentioned that the intrinsic motivation of the potential participants is more important than receiving a HPFI. At the same time, they acknowledged that HPFIs could give eligible individuals a push in the right direction to actually start in a CLI at all. Positive HPFIs that were mentioned were a discount on health insurance premium or on the subscription fee for sport clubs, cash money, vouchers for new clothing, a free outing and a free party or dinner.

Characteristics of HPFIs and opinion with regard to implementing HPFIs as addition to a CLI

With regard to HPFIs in general, it was often mentioned that intrinsic motivation of the individual to participate in a CLI might be more important for successful behavioral change than adding a HPFI. A part of the respondents had a negative opinion with regard to implementing HPFIs in general and some of them only had a negative opinion towards implementing negative HPFIs, such as a higher premium at the health care insurer.

Negative HPFI

Respondents mentioned that negative HPFIs might feel patronizing. Frequently mentioned forms for a negative HPFI were a higher premium for the health insurance or higher out of pocket costs for health care. Other forms mentioned were, a higher subscription fee for sport clubs, sugar tax, not being allowed to go out for dinner or to order take away food for a predetermined period. Maintainer of these negative HPFIs could be the health care insurer, the employer, or the sports club. Despite the general negative attitude towards negative HPFIs, respondents did mention that negative HPFIs could be effective for people with a low income, older people and patients suffering from a chronic disease. On the other hand, it was mentioned that if eligible participants knew they could lose money or have to pay higher premium if they do not fulfill criteria of the CLI, these individuals might refuse to participate on beforehand. The idea of having a chance to lose money will prevent they will participate.

Positive HPFI

Respondents with a positive opinion with regard to implementing HPFIs as addition to a CLI, focused mostly on positive HPFIs. Some respondents mentioned that predetermined conditions should be fulfilled before participants of the CLI are eligible to receive the reward, such as a discount on the health insurance premium or discount on or exemption of the

subscription fee for sports clubs. It was noted that discounts do not work well for individuals with a low income. Even if they get discount on a service or product, they are often still not able to buy it.

Another form that was frequently mentioned in the group of representatives of the general population was getting a good deal for example for buying a bicycle, free repairs to the bicycle or a gift like a bicycle computer. Also free outings and trips were mentioned as preferable HPFIs. For adolescents specifically, credit for their prepaid phone card or a computer game were mentioned as gifts that could be offered to them. A bonus from the employer could also be an eligible HPFI according to some of the respondents. An example for such a bonus given was an annual sports day organized by the employer in which the employee could participate during working hours. In addition, gift vouchers and saving systems were mentioned by the respondents as well as lower prices or discount on fruit and vegetables (i.e. healthy food).

Some HPFIs that are meant to be positive can work out negatively. A more specific example is, they believed it to be unfair that individuals with for instance a chronic disease, cannot fulfill the requirements to receive a positive HPFI. An example of such a positive HPFI is that an employee would receive an extra day of paid leave as a reward for not being ill during the year. Individuals with a chronic disease had to call themselves sick at work during the year, due to their illness, and therefore could not apply for an extra day off from their employer as a reward for not being ill during the year. For them the supposed reward feels like punishment because the chronic disease they suffer from has happened to them.

Target groups designated by the respondents for whom positive HPFIs could be effective were diverse, but individuals with a low income, children, and adolescents were mentioned most. Immigrants, elderly and individuals with a high risk on a chronic disease or who already suffer from a chronic disease were also eligible groups to offer a positive HPFI according to the respondents.

With regard to the positive HPFI, one clear difference between the general public population and the two other target populations was found. The general public mainly designated employers as the provider of the HPFI, whereas mainly the health insurer was pointed out as provider of the HPFI by people with a high risk on a chronic disease or patients with a chronic disease.

The respondents in all three subpopulations were a little more positive with regard to the expected effect of a positive HPFI compared to the negative HPFI. Part of the respondents mentioned that intrinsic motivation is far more important for people to be able to change their lifestyle or complete a CLI than adding a HPFI to a CLI. On the other hand, they acknowledged that sometimes an HPFI could give someone a boost to start with a CLI or to start with changing their lifestyle. Moreover, it was mentioned that if the amount of the reward is high enough, everyone could be motivated to participate in a CLI because we all love money in the end. Being able to join a sports club for free could be a facilitating factor

that individuals with a low income need, because it is much more difficult for them to pay subscription fees for a sport club.

Acceptability of implementation of HPFIs

Towards negative HPFI

The majority of the respondents thought that implementing negative HPFIs was not acceptable at all. Reasons mentioned are that, principles of solidarity for health insurance are important to retain and manipulating people by health insurance premiums is not acceptable according to the respondents. Moreover, people with a low income will not be able to pay a fine if they not fulfill the conditions of the CLI.

According to some respondents, implementing negative HPFIs is acceptable, in the case where conditions for facing a negative HPFI were clear at the start of the CLI and participants accepted these conditions. A form of a negative HPFI acceptable for implementation was that participants who after enrollment would not participate or finish the CLI, had to pay for the CLI.

Towards positive HPFI

Overall, the implementation of positive HPFIs was found more acceptable than of negative HPFIs, but not all respondents had a positive attitude towards positive HPFIs. Some of the respondents argued it was acceptable to implement positive HPFIs, but only for a predetermined period. Discount on the health insurance premium was seen as an acceptable positive HPFI to implement. Other acceptable positive HPFIs mentioned were food parcels, cash or an outing. Positive HPFIs financed by the employer were acceptable to implement if the health status of the employee could influence the work performance negatively.

Implementing positive HPFIs was considered acceptable for specific groups, like individuals with a low income or individuals who need help to change their lifestyle. Other respondents had a negative attitude with regard to the acceptability of implementing a positive HPFI and stated that a HPFI is patronizing. Intrinsic motivation should be the driver to participate in a CLI instead of a HPFI according to some of the respondents. Cash money was mentioned not acceptable for implementation as a positive HPFI. It was also doubted that it is verifiable if a participant meets the predetermined criteria to receive the HPFI. A HPFI was also found unacceptable for individuals with a chronic disease, because they are not responsible for having this disease according to the respondents.

Discussion

This study was performed to gain first insights in the attitude of the general public and individuals eligible to participate in a combined lifestyle intervention (CLI) towards using a health promoting financial incentive (HPFI) to stimulate participation and adherence to a CLI. Besides that, it was investigated which characteristics of a HPFI were preferred by the respondents.
Opinions towards HPFIs were diverse within the groups for attitude and acceptability towards HPFIs and almost no differences between the included subpopulations were found. The one clear difference between the subpopulations found, was that the general public preferred employers as a provider of a positive HPFI, whereas the high-risk group and the chronic disease group preferred health care insurers as provider of the positive HPFI. Respondents with a positive opinion with regard to implementing HPFIs as addition to a CLI, focused mostly on positive HPFIs. Negative HPFIs might feel patronizing and the majority of the respondents thought they were not acceptable at all. Despite the acceptability for mainly positive HPFIs, it was mentioned that only intrinsic motivation is effective for participation in a CLI.

Overall, the attitude towards implementing HPFIs to CLIs was diverse in the present study. Both positive as well as negative attitudes of the respondents towards HPFIs were found. In accordance to the study of Giles et al. we found that positive HPFIs were preferred over negative HPFIs [17]. Various studies that investigated the attitude of individuals towards HPFIs, found that about half of the respondents had a positive attitude [5-10] depending on what specific shape the HPFI had. It should be taken into account that some people will always have a negative attitude towards HPFIs in any shape. Reisinger et al. found that sometimes people stated that they appreciated the care they received and they feel receiving an HPFI is inappropriate [18]. If HPFIs will be implemented and cost-effectiveness is being determined, it should be taken in account that these HPFIs will be effective only for a specific part of the total target group of a CLI to prevent an overestimation of the cost-effectiveness.
Almost no differences in attitude towards HPFIs between the general public, high-risk group, and individuals with a chronic disease were found in our study. We expected a more positive attitude of the individuals eligible for a CLI for a positive HPFI, because they could benefit of the implementation of a HPFI. The general public would not receive a HPFI because they are not eligible for participating in a CLI. We expected in the general public a more positive attitude towards negative HPFIs and a more negative opinion towards positive HPFIs, because receiving a reward is in their opinion unfair while individuals would be rewarded for having bad health behavior.
The one clear difference between the three target populations we observed was the opinion with regard to the provider of a positive HPFI. The general public preferred employers as

providers of the HPFI, whereas the high risk and chronic disease group preferred the health care insurer. A plausible explanation for this difference could be found in the characteristics of the participants of the focus groups. In our study, we included participants in the high-risk group if they had a BMI over 30 and if their social economic status was low. As well as the participants in the chronic disease group, it is likely that the high-risk group participants do not have a job or are retired already. An HPFI provided by an employer would not be any good for them, because they are not linked to an employer. Participants in the group representing the general public were more likely to have a job and therefore have an employer. A consequence of providing a HPFI by employers, is that it is only available for employees of a selection of companies that offer these HPFIs. By offering HPFIs via the health care insurer, a larger proportion of the population, and more specifically more vulnerable groups, could be reached.

An interesting result of the focus groups was that a positive HPFI in the form of discount on the health care insurance premium was found acceptable by most of the respondents. On the other hand, a negative HPFI in the form of a higher health care insurance premium was not found acceptable. The respondents mentioned that the principle of solidarity for the health insurance should be retained. A higher health insurance premium if individuals do not comply with a healthy lifestyle could be considered as reasonable, although it will be hard to prove the causal relation between an unhealthy lifestyle and health care costs. For some diseases genetic predisposition might be of more influence in getting a disease than having an unhealthy lifestyle. To justify a higher health insurance premium, the insurers should deliver incontrovertible evidence that the lifestyle of the individual caused the incidence of a disease like diabetes type 2. Steinbrook (2006) however, mentioned that it might seem attractive but very complicated to implement these specific initiatives in the health insurance [19].

Strengths and limitations

Strength of the study was that we used separate subpopulations and not have mixed focus groups. By doing so, we were able to identify potential differences between the three target populations in opinions and attitude. A limitation of the present study was that only potential participants of a CLI were included. To get an overall picture, the attitude and opinions towards HPFIs of other stakeholders as health care professionals, policy makers, and health care insurers should be considered too. This overall picture is essential for giving a good advice about the feasibility of a successful implementation of a HPFI added to a CLI.

To get more insight in which forms of HPFIs are acceptable and considered as effective, further research should focus on the development of different forms of a HPFI that would be feasible to implement in practice and discuss with the target group which of these HPFIs they feel could be effective and acceptable. Pilot studies of promising HPFIs to determine the effectiveness might help to increase the acceptability of the HPFI by other stakeholders.

Because the CLI is covered by the health insurance from 2019, it will not be difficult to find settings to experimentally implement HPFIs.

Conclusion

This study aimed to gain more insight in the attitude towards the use of HPFIs to stimulate participation of a CLI among eligible participants and of the general public. Our study showed that the attitude towards health promoting financial incentives (HPFIs) added to a CLI varied and in all three subpopulations positive and negative attitudes towards HPFIs were found. Overall, positive HPFIs could be considered as an instrument that might be implemented in practice to increase participation rates in health programs and in changing health related behavior, but expectations with regard to effectiveness and practical applicability are not strongly positive. This study is one of the first that investigated the attitude of eligible participants and the general public on implementing a HPFI. More research is needed into the opinions of other stakeholders and specific forms of positive HPFIs and their effectiveness in practice.

List of abbreviations

BMI: Body Mass Index

CLI: Combined Lifestyle Intervention

HPFI: Health Promoting Financial Incentive

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Appendix 1. Description of the composition of the focus groups

	Focus group 1	Focus group 2	Focus group 3
General public	Male 59 years	Male 62 years	Male 52 years
	Male 60 years	Male 63 years	Male 70 years
	Male 71 years	Male 68 years	Male 73 years
	Female 48 years	Female 55 years	Female 46 years
	Female 52 years	Female 56 years	Female 54 years
	Female 68 years	Female 70 years	Female 55 years
	Female 70 years	Female 70 years	Female 58 years
	Female 73 years	Female 73 years	Female 67 years
Chronic ill patients	Male 65 years	Male 65 years	Male 71 years
	Male 71 years	Male 67 years	Female 40 years
	Male 73 years	Male 68 years	Female 50 years
	Female 65 years	Male 72 years	Female 56 years
	Female 50 years	Female 40 years	Female 62 years
	Female 55 years	Female 51 years	
	Female 63 years	Female 58 years	
	Female 75 years	Female 63 years	
High risk individuals	Male 62 years	Male 67 years	Male 53 years
	Male 45 years	Male 70 years	Male 60 years
	Male 65 years	Male 70 years	Male 60 years
	Female 42 years	Female 46 years	Female 44 years
	Female 61 years	Female 54 years	Female 49 years
	Female 65 years	Female 63 years	Female 50 years
	Female 69 years	Female 66 years	Female 62 years
	Female 70 years	Female 80 years	Female 67 years

Appendix 2. Semi-structured interview guide

1. What is first that comes to your mind when you hear the term ‘financial incentive’. Please write this down on a paper.

2. What is your opinion towards implementing financial incentives as addition to a combined lifestyle intervention?

3. What are the preferred characteristics of a positive financial incentive?

4. If the positive financial incentive has these preferred characteristics, is it acceptable to implement them in practice?

5. What are the preferred characteristics of a negative financial incentive?

6. If the negative financial incentive has these preferred characteristics, is it acceptable to implement them in practice?

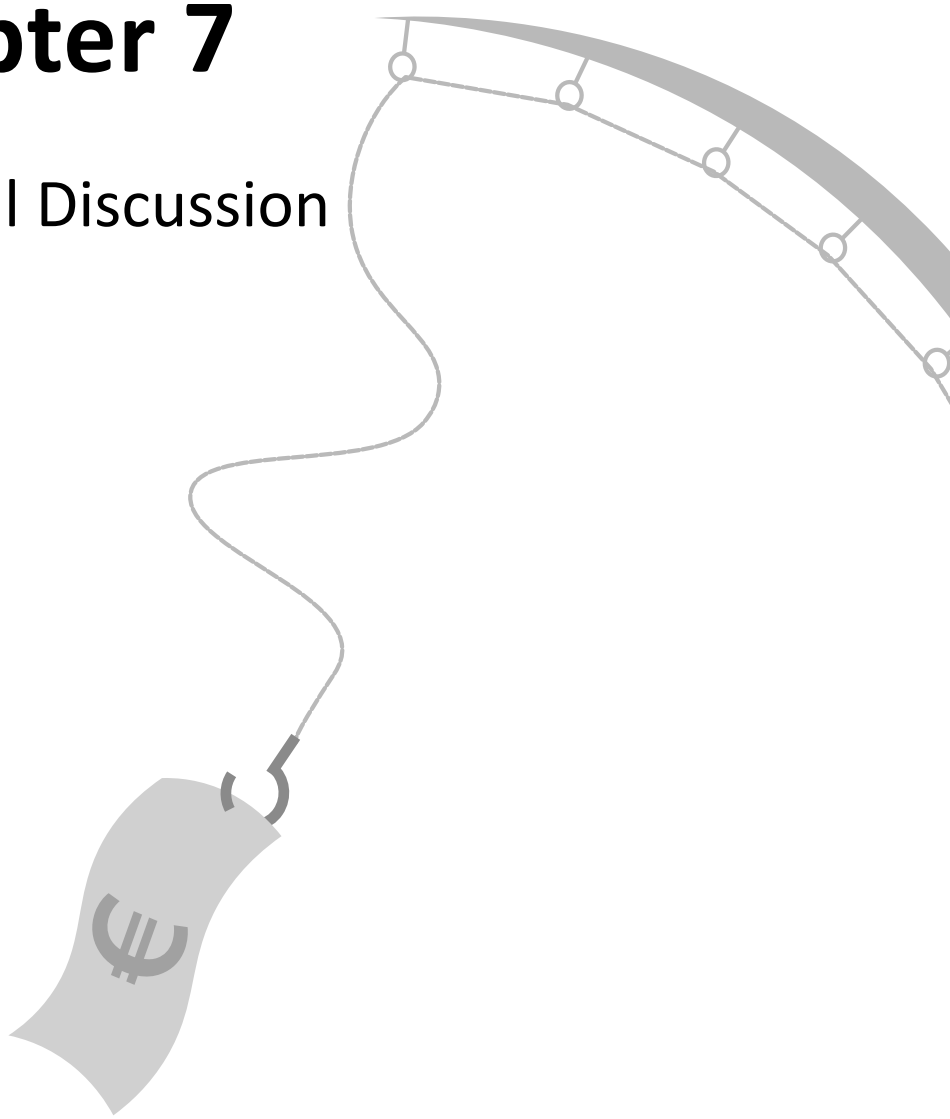
7. What kind of financial incentive is unacceptable to implement as addition to a combined lifestyle intervention in health care?

Appendix 3. Code tree used for the analysis of the transcripts

First association FI	Negative FI	Characteristics
		Opinion
	Positive FI	Characteristics
		Opinion
	Neutral/I don't know	
Form of FI	Negative FI	Characteristics
		Provider
		Target group
	Positive FI	Characteristics
		Provider
		Target group
Opinion implementation FI	Negative opinion	
	Positive opinion	
	Neutral/I don't know	
Expected effect FI	Negative FI	
	Positive FI	
	Neutral/I don't know	
Acceptability implementing FI	Positive FI	Positive opinion
		Negative opinion
	Negative FI	Positive opinion
		Negative opinion
	Neutral/I don't know	

Chapter 7

General Discussion



This thesis is composed of two parts. The first part contains research on the feasibility of a health promoting financial incentive (HPFI) to stimulate participation and compliance in a combined lifestyle intervention (CLIs). The second part contains research on the level of acceptance of wider implementation of such HPFIs by both the target population and the general population. The most important results of the research project will be described and discussed below in the order of the research objectives of this thesis. The objectives formulated in this study were:

- What is known from the research literature about the effectiveness of HPFIs used for promoting physical activity in the health care setting?
- What are preferences of eligible participants of a CLI (chronic ill patients and those with high risk) with regard to form and content of a HPFI added to a CLI and are there individual differences in preferences?
- Which factors are facilitators or barriers for successful implementation of a CLI in the primary health care setting and which factors facilitate adding a HPFI to stimulate participation in such a CLI?
- What is the attitude of the general public and the target group of a CLI (chronic ill patients and those with high risk of chronic disease) towards providing a HPFI to stimulate participation in a CLI?

Main findings

What is known from the research literature about the effectiveness of HPFIs used for promoting physical activity in the health care setting?

Our systematic literature study (**chapter 2)** showed that only a limited of studies have specifically studied the effectiveness of a HPFI to promote physical activity in the health care setting. Those three studies that did, showed that adding a HPFI to the CLI does not result in positive effects on the long term in physical activity levels, weight loss, and compliance of individuals. However, the included studies did not take account of the participants' preferences with regard to the characteristics of a HPFI. The lack of effect of the HPFIs might be owed by a mismatch of the preferences of the target group and the design of the HPFI. It is recommended before implementing a HPFI, first study the preferences of the target group towards the characteristics of a HPFI.

What are preferences of eligible participants of a CLI (chronic ill patients and those with high risk) with regard to form and content of a HPFI added to a CLI and are there individual differences in preferences?

In **chapter 3** preferences towards a HPFI to stimulated participation and compliance in aa specified CLI were investigated. A discrete choice experiment (DCE) was performed in a group of patients that received integrated care in primary care setting for diabetes type 2 and/

or cardiovascular disease. The potential participation of the CLI in combination with the different forms of financial incentives included in the DCE varied from 37.9% to 58.8%. Most preferred HPFI was €100 in cash money, awarded after completing the lifestyle program if the participant attended at least 75% of the scheduled meetings. A remarkable finding was that the potential uptake was not significantly related to the monetary value of the incentive (ranging between 15 and 100 euros).

Which factors are facilitators or barriers for successful implementation of a CLI in the primary health care setting and which factors facilitate adding a HPFI to stimulate participation in such a CLI?

In **chapter 4** perceived barriers and facilitators for successful implementation of a CLI in the primary care setting were identified by performing interviews with health care professionals and managers in primary health care and policy staff of community health services. Essential preconditions for a successful implementation of a CLI reported by the respondents were structural funding, a tailored recruitment strategy, supportive infrastructure and communication between all stakeholders (such as the GP and the dietician)and a CLI that meets the needs of the eligible participants. One of the main barriers reported was the non-committal character of a CLI for health care professionals. To facilitate implementation, offering a CLI to eligible patients should be considered as standard care instead of as an additional task. Diverse opinions towards adding a HPFI to a CLI were found. Respondents preferred positive HPFIs over negative HPFIs and believed that HPFIs could positively influence participation rates and limit the number of drop outs from the CLI.

What is the attitude of the general public and the target group of a CLI (chronic ill patients and those with high risk of chronic disease) towards providing a HPFI to stimulate participation in a CLI?

Chapter 5 focused on the relation between preferences for a CLI and physical activity levels of the respondents. The study showed that preferences with regard to characteristics of a CLI indeed varied between DM2 patients who were already more physically active and DM2 patients who were less physically active, in the sense that more physically active DM2 patients did not prefer to receive a reward for participating in a CLI. **Chapter 6** showed the results of focus group interviews with the aim to gain more insight in the attitude towards HPFIs of the general public and individuals eligible to participate in a CLI. Both the general public and eligible participants were reserved and had doubts as to the effectiveness of adding a HPFI to stimulate participation in a CLI. Opinions with regard to implementing a CLI with a HPFI as addition diverged within both the general public and individuals eligible to participate in a CLI. Both positive and negative attitudes were found and there seemed no clear-cut difference between the groups in their attitudes.

Overview

Since the course of the research project was altered during the project's trajectory, which had consequences for what could be investigated, this will be discussed first. Second, strengths and limitations of this research project and a reflection on the results that were found will be discussed. At last practical implications and future research directions will be described. Finally, the overall conclusion of the research described in this thesis will be presented.

Course of the research project

During this research project it became clear once again how difficult it is to implement a CLI. After a period (between the end of 2013 and halfway 2016) in which a lot of effort was put in preparing and implementing the CLI in primary care practices in a region in the Southern part of the Netherlands, the intake of participants fell short on expectations both in the intervention region with the HPFI added to the CLI, and in the control region with the regular CLI. Despite of the hard work of the health care professionals involved, the CLI had to be stopped prematurely. In **chapter 4** results of a process evaluation are shown. This study was performed to investigate the implementation of different CLIs as carried out by several care groups and the opinion towards adding a HPFI. The results of this qualitative study show that many preconditions have to be met before successful implementation of a CLI can take place. During the implementation of the CLI in this project, many difficulties were experienced in the complex financing of the CLI. No structural funding was available in the basic health insurance yet. Financing of the CLI varied per health care insurer and per insurance package, which was complex for both health care professionals and eligible individuals.

In addition, it turned out it was not feasible to include enough participants in a short time to start up with a full group of participants. Adequate financing was based on groups with at least 8 participants (covered by health care insurance or paying out of pocket) which turned out not to be feasible in everyday practice. A more univocal policy on the financing of the CLI across the different health care insurers and health care insurance packages with more flexibility of a group -or individual based program, could have probably made the implementation of the CLI more successful.

Strengths and limitations

A major strength of this study was that all stakeholders, which included health care professionals like dieticians, physiotherapist, general practitioners and practice nurses, management of the care group and the health care insurer, were committed from the start of the project. This way the gap between research and practice was minimized and by working together and using each other's expertise the chance for successful implementation was optimized.

The way this was done can be shown by the replicating effective programs (REP) framework which is suitable for distinguishing the different stages in implementing health care interventions. The framework describes four phases for health services-based interventions: pre-conditions, pre-implementation, implementation, and maintenance and evolution [1]. The first phase describes 'preconditions' for implementation such as identifying needs, effective interventions and barriers and developing an intervention package. In this research project, this phase was executed first (**chapter 2** and **3)**. The second phase 'pre-implementation', was also executed and health care providers and patients from the target group were consulted and informed. In the third phase, the implementation of the intervention, the inclusion of participants for the CLI and for the additional HPFI was difficult and eventually did not work out as expected. Despite the thorough preparation and fulfilling most elements in the REP framework, the implementation phase did unfortunately not succeed. Therefore, the fourth phase 'maintenance and evolution' consisted of a process evaluation to identify facilitators and barriers of the implementation of the CLI in earlier cases and the potential effectiveness of the HPFI (**chapter 4**). Afterwards, we performed additional research on the preferences with regard to a HPFI of the target group for the CLI and on the acceptability (**chapter 5** and **6**) which can be assigned to the 'pre-condition phase'. By doing so, we started the process of the REP framework again.

Another strength of this research project is that despite a failing implementation of the CLI (both with and without a HPFI), still useful results have been reported, such as the importance of a positive attitude of health care professionals and the importance of structural funding, to help future research projects preventing such a scenario of a failing implementation of an intervention.

The stakeholders have been involved in the process from the start and were asked to give input based on their expertise that could support a successful implementation of the intervention. The research team had close contact with the manager of the care group that participated in the project with regard to the implementation of the CLI which was the responsibility of the care group.

However, working in the practice setting instead of a research setting requires flexibility in which choices have to be made between what is best in the practice setting and what is best to perform the best research is also a limitation. The course of the project cannot be planned completely on beforehand because of the dynamics between preferences for the practice setting and the research setting. This was a complex part of this research project, but as a result more knowledge now is available on conditions that have to be met to perform these kind of studies in real life.

With regard to the chosen HPFI, a discrete choice experiment (DCE) was performed to gain insight in the preferences for a HPFI of the target population and to fit the HPFI to the preferences of the target group (**chapter 3**), to maximize the chance for a successful

implementation of the HPFI. This can be seen as a strength since to our knowledge, this study is the first that has investigated these preferences, before designing the actual intervention, which is the addition of a HPFI to a CLI.

Results in the light of theoretical notions on 'motivation' in health behavior change

In the Self-Determination Theory (SDT) external regulation in the form of a HPFI is an extrinsic motivation that can motivate eligible participants to participate in a CLI and potentially have a higher compliance. However, according to the SDT an extrinsic motivator like a HPFI will crowd out the intrinsic motivation of participants and will not result in sustainable change in health related behavior [2, 3]. In our research project health care professionals experienced that, regardless the addition of a HPFI, the intrinsic motivation of patients to participate in the CLI was low. The lack of willingness to participate implies that the intrinsic motivation of eligible participants was very low. By adding an extrinsic motivation in the form of an HPFI which helps patients to start participating in a CLI and have better compliance, they might experience the positive effects of having a more healthy lifestyle. As a consequence, the level of intrinsic motivation for might increase to a level that is needed for sustainable health behavior, also when the HPFI is removed [4]. The SDT is still a good fit in explaining if and how an HPFI can be effective, with the comment that the insights of Strang et al. should be incorporated. This does not require an adaption of the model, but more a mind shift of the developers of the SDT.

According to the results of this study, it seems that preferences with regard to HPFIs differ between individuals and there might be specific preferences for subgroups. The SDT is a framework with different components. It is likely that there are differences between individuals on how much a component as for example personality differences in autonomy or mental health, contributes to creating skills in individuals that help to sustainably change their own health behavior to a more healthy one. According to the results of the focus groups and discrete choice experiments, HPFIs might be helpful for specific groups of individuals to get motivated to participate in a CLI and receive the skills and the confidence to change their health behavior.

Behavior change is complex though and besides motivation other factors influence behavior change also, as is shown in the COM-B system [5]. Opportunity and capability also influence motivation and these three factors also independently influence the behavior of an individual according to this model. Besides the potential effect of a HPFI on motivation, it might also positively influence the factors capability and opportunity and by doing so stimulate behavior change also directly and potentially increase intrinsic motivation of an individual. Capability of an individual increases if they participate in a CLI. By increasing the compliance to a CLI by the added HPFI indirectly the HPFI might influence the capability of an individual. However until

now, little is known on how a HPFI influence these different factors that influence behavior. More research on these mechanisms is necessary.

Acceptability of HPFIs

Despite the growing number of studies on the effectiveness of HPFIs [6-9], little attention has been given to ethical issues entailed to the implementation process of HPFIs. Ethical issues might occur among people in different groups like health care professionals, patients eligible for participation and the general population.

Health care professionals were not positive towards HPFIs because they felt that patients should participate in a CLI because they have intrinsic motivation and not because of an extrinsic motivator in the form of a HPFI (**chapter 4**). On the other hand, health care professionals in the Netherlands mostly do not have enough time to motivate a patient to participate in a CLI since the work pressure is high for general practitioners and practice nurses and we experienced in this study that the intrinsic motivation of patients to participate in a CLI was low. However, prevention can be seen as part of the integrated care programs that DM2 and CVD patients receive in primary care. From that perspective, informing and motivating patients for physical activity and healthy eating behavior is part of the standard care of a general practitioner and practice nurse. The current high workload of health care professionals in primary care is a barrier for motivating patients to participate in CLIs. A mind shift is necessary to change the opinion of the different health care professionals that motivating patients to participate in CLIs is basic care instead of a task that is optional and only is executed if there is time and opportunity. Furthermore, if a patient decides to participate in a CLI because of the HPFI, he or she might develop intrinsic motivation during the CLI because they feel better and potentially have less health problems [4].

Part of the general population however, have concerns towards the fairness of adding targeted HPFIs only for participants of the CLI instead of universal incentives for the whole population [10]. A study by Long et al. that evaluated the attitude towards paying patients for their performance showed an almost evenly split between the attitude that it is a good idea or a bad idea [11]. In **chapter 6** similar results were found towards the attitude towards implementing a HFPI as addition to a CLI. Moreover, non-patients might have the feeling of being treated unfairly because they do not qualify for receiving a HPFI since CLIs and the added HPFIs are designed for patients with an unhealthy lifestyle with regard to physical activity and eating habits. Acceptability of positive HPFIs by the general population might increase if the HPFI has a thoughtful design [12]. Potentially, acceptability of HPFIs might also increase by anticipating on beforehand on the feeling of unfairness towards HPFIs of the general population. It can be explained that the benefits for them with regard to for example that a healthier population overall might generate less health care costs and consequently might reduce the rising health care insurance premiums. By doing so, the feeling of unfairness might reduce, because the

whole population might benefit from the HPFIs that are implemented for specific groups. A systematic review of Giles et al. showed that the acceptability of implementing HPFI increased when it is effective and cost-effective [13].

As a consequence of all issues towards implementing positive HPFIs, it could be argued that implementing a negative HPFI (i.e. a fine when an individual does not meet predetermined outcomes) might be more in agreement with the attitude of the general population. However, a recent systematic review showed that implementing positive HPFIs are preferred over negative HPFIs [10]. Moreover, there might be a notable risk of low participation rates in the CLI if a negative HPFI in the form of a fine is added and therefore this type of incentive won't be effective. In this light, a positive HPFI in order to motivate eligible individuals to participate in a CLI would be preferable to implement. Considering the negative attitude of part of the general population, actions towards positive HPFIs, creating a more positive attitude in this part of the population should have a prominent place in the pre-implementation phase. Health care professionals also preferred positive HPFIs and see potential for increasing participation rates and limiting drop outs in a CLI when adding a HPFI (**chapter 4**).

In a study by Ashcroft was mentioned that implementing financial incentives for patients, might decrease their decision making autonomy [14]. However, in case of HPFIs are applied to motivate people to make the healthy choice, but they are still free to make the unhealthy choice. Therefore, a HPFI does not harm the autonomy of the patients who are eligible to participate in a CLI and an added HPFI.

To give all eligible participants a fair chance to receive a reward, prerequisites should be more oriented to treatment adherence instead of on meeting end goals like a minimum amount of weight loss or an increased score on a fitness test. The results in **chapter 3** on the preference of the target group for a HPFI were in line with this statement and show that prerequisites on attendance rate were preferred over prerequisites in terms of increased scores on a fitness test. The heterogeneity of the population with regard to health literacy, social support, and socioeconomic status is an argument in favor of implementing HPFIs on treatment adherence instead of for example meeting minimum amounts of weight loss. A national study in Israel showed that DM2 patients with low socioeconomic status received more preventive care, but still had worse health outcomes [15]. Having low health literacy skills negatively influences a good understanding of good and bad choices for the health outcomes of the individuals and is seen as an important factor in how patients are able to manage their DM2 or CVD [16-18]. Individuals having unfavorable versions of these characteristics might have a lower chance to meet prerequisites based on outcomes like weight loss and scores on a fitness test and earn the HPFI. As a consequence they might not receive a reward, although they were always present at meetings and increased their skills and knowledge towards managing their own health. For participants with low health literacy, participation in a CLI is helpful to improve their health literacy, their awareness of their chronic disease, and to improve their skills to

manage their chronic disease. By not receiving a reward because of only focusing on outcome oriented prerequisites that have to be met, intrinsic motivation will decrease for these people to continue participating and invest in a more healthy lifestyle and they might quit.

Practical implications and recommendations for implementing HPFIs

Financing of HPFIs

HPFIs are not embedded in the daily practice of health care and there is no consensus yet on who would be responsible for financing such HPFIs. This topic has to be brought in debate first, since it is not clear who is responsible or who benefits. It is not likely that HPFIs will be financed by health care insurers, community health services, or municipalities. An opportunity for financing HPFIs in primary care is by starting a collaboration between the health care sector and local entrepreneurs, such as fitness clubs and greengroceries. The local entrepreneurs might benefit by expanding their clientele and increase their sales. Sponsoring an effective HPFI for participants of a CLI might be an investment for which they will receive return their investments.

Moreover, it is advisable to calculate the potential savings in health care costs and societal costs if participants get a healthier lifestyle. Large companies might be interested to finance effective HPFIs for their employees. If their employees improve their lifestyle and therefore reduce their chances of developing chronic diseases by for example losing weight, an employer might benefit too. Employees with a chronic disease do have more sick days than healthy employees [19]. Investing in a healthier lifestyle of employees might benefit in a reduction of sick days and save money for the company.

Implementation of the CLI

HPFIs might be of influence on the effectiveness of CLIs. However, there are many preconditions influencing successful implementation of CLIs themselves among which structural funding (**chapter 4**). Since January 2019 there is funding in the basic health insurance for a limited number of CLIs that fulfill predetermined requirements. For the patients the barrier towards financing the CLI is removed, but for health care providers the barrier with regard to funding is not completely removed, because the funding is still based on a group rate which is only adequate when having a certain amount of participants. However, the structural funding is one link in the chain and several other preconditions have to be met also for a successful implementation of a CLI. Our study (**chapter 4**) shows that motivated health care professionals, a well thought-out design of a CLI, communication between different stakeholders, and a good recruitment strategy are also necessary for successful implementation of a CLI. Besides all preconditions on the behavior and skills of the health care professionals, the design of a CLI might also substantially influence the implementation process and participation rates. In the concept of patient centered care, a one size fits all CLI seems not to be the way to

go. Outline a plan with a more tailored approach for the participant might create a better foundation of a successful CLI.

Implementation of the HPFI

When, as pointed out in the former paragraph, all preconditions are met for the implementation of the CLI, the next step can be the addition of a HPFI to increase the inflow of the CLI. The form of the HPFI, however appears complex to determine. The saying 'as many opinions as people' is suitable in this context. To optimize the chance for an effective HPFI, it might be better to have a HPFI in the form of a voucher with a certain value and let the participants choose a reward for themselves. By doing so, participants can choose a reward that motivates them to achieve their goals in the CLI and that might increase the chance of success in the CLI for the participant. The prerequisites that have to be met can also be determined by the individual himself. If an eligible participant and his health care professional decide in consultation a feasible goal for that individual patient for receiving the HPFI, the chance of quitting the CLI due to too little motivation might be reduced. This individual approach is also in line with the concept of patient centered care, which has taken center stage in many discussions with regard to quality of care.

Future research directions

This study has provided valuable insights in important components that contribute to a successful implementation a CLI (with or without a HPFI). To gain more insights on the effectiveness of HPFIs when successfully implemented, more research is needed still though. The three CLIs that are selected to be part of the basic health insurance have indications to be effective. When research is performed on the effectiveness of a HPFI added to a CLI, it is advisable to use one of the CLIs that is part of the basic health insurance. Despite the structural financing of selected CLIs, structural offering CLIs seems not to be easy and sufficient inflow of patients is difficult. With regard to choosing a region to implement the HPFI as addition of a CLI, it is advisable to select a region in which there is already experience with executing a CLI. This increases the feasibility to study the effectiveness of the HPFI and produce valid results. The complexity of the implementation of a CLI and optional an added HPFI, might ask for another implementation strategy than just implementing it all simultaneously. A better implementation strategy might be to implement the CLI first and if all preconditions are met and barriers are solved, the HPFI can be added. To study the effect of adding a HPFI a stepped wedge design might be appropriate to use. In a stepped wedge design all participating general medical practices that already have implemented the CLI, will eventually add the HPFI to the CLI. In this design, the order in which the general medical practices will enter the study is randomized. By doing so, more support can be given to the practices during the first period of implementation of the HPFI than when all practices start at the same time. Compared to

a RCT this is an advantage, because in a RCT all practices implement the HPFI at the same time, which limits the amount of support that can be given per practice due to limitations in availability of the researchers that support the study. Moreover in a stepped wedge design, randomization takes place at practice level instead of at individual level. By doing so, within a general practice there is no difference between patients regarding whether or not receiving a HPFI. This prevents a feeling of unfairness in the group of patients that are not offered a HPFI and as a consequence they might underperform in a CLI because they are feeling disadvantaged.

In order to meet preconditions for successful implementation of a HPFI as addition to a CLI, it is relevant to study who are potential financers of the HPFI. In order to be able to convince them of the potential effectiveness of a HPFI, researchers have to discuss with them, in for example focus groups, how they define a HPFI as effective. It is reasonable to belief that financers prefer outcome oriented measures, while this study show that attendance oriented measures might be better for successful implementation of the HPFI. During the dialogue between researchers and financers, it is important to point out that by an increased compliance in a CLI, the chance for positive results in outcome oriented measures like weight loss will be higher. After reaching consensus on the definition of when a HPFI is effective, researchers should find outcome measures to be able to meet the needs of the potential financers. This might increase the commitment of potential financers of the HPFI to actually contribute to structural arrangement for the funding of a HPFI if it is proven to be effective.

Another precondition that has to be met before a HPFI can be successfully implemented as addition to a CLI is that potential barriers such as ethical issues should be investigated. The results of the study in **chapter 6** showed that these factors have probably a larger role than expected prior to this research project, in the chance of successful implementation of an HPFI. A lesson learned in this research project is that first, potential ethical issues should be discussed with stakeholders in this process. Potential solutions to solve the ethical issues should be identified and the best case scenario should be implemented in a research setting.

Overall conclusion

In this thesis the research is described on the feasibility and acceptability of implementing health promoting financial incentives (HPFIs) in combined lifestyle interventions (CLIs). Although, no evidence could be found for the effectiveness of HPFI to stimulate participation and compliance of a CLI in this project due to a failing implementation of the CLI and the HPFI and limited evidence in the literature, there are indications that a HPFI can form a little piece in the machinery to motivate eligible patients to participate in a CLI. Health behavior change is complex and therefore more research has to be performed on the role of HPFIs in this process, their potential effectiveness, and differences in subgroups of eligible participants. It is advisable in future research to invest in the preliminary phase to study preferences of the

target population towards a HPFI and CLI, which preconditions have to be met for successful implementation, and the acceptability of the preferred HPFI by the health care professionals and general population. Moreover, the implementation of a HPFI might be more successful if prerequisites are more oriented on compliance instead of meeting outcomes like weight loss, to give all eligible participants a more fair chance to receive a reward.

This study also showed that opinions on acceptability of HPFIs diverged. It is important to invest in getting deeper insight in the attitude of the stakeholders on implementing a HPFI to a CLI and creating more support on beforehand in both stakeholders and the general public for implementing a HPFI. For successful implementation of a HPFI both practical as well as ethical issues have to be taken care of.

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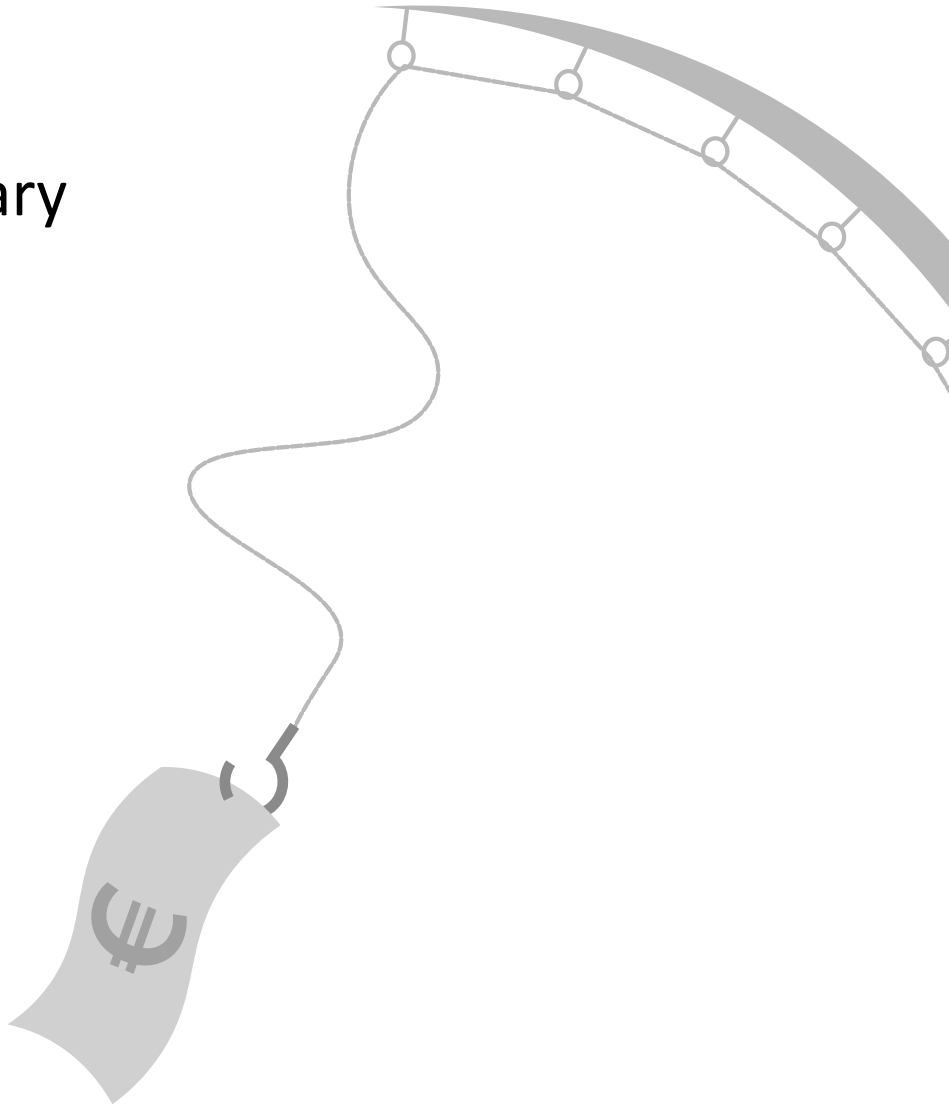
Summary



Introduction

Physical inactivity and unhealthy eating habits are risk factors for developing chronic diseases. The percentage of people with overweight or obesity is rising in the Netherlands and more over 50% of the Dutch adults do not meet the physical activity guidelines. Combined lifestyle interventions (CLI) might help to control the rising numbers of people with overweight and obesity and in improving physical activity levels and eating habits of participants. CLIs are defined as interventions that aim to improve physical activity levels and eating habits of participants at risk for developing or already diagnosed with a chronic disease related to overweight or physical inactivity.

Eligible individuals for a CLI are often not motivated to participate in a CLI. An extrinsic motivator such as a health promoting financial incentive (HPFI) might help to overcome barriers to participate. A HPFI is a cash or cash-like reward or fine provided contingent on (non-) performance of healthy behavior.

There is no insight in the attitude and preferences towards HPFIs of the end users and health care professionals in the Netherlands. Available research on the attitude on HPFIs is not adoptable and implementable in the Dutch setting. Research is necessary to gain insight in these topics.

Aim of the research

The research questions of this thesis were:

1. What is known from the research literature about the effectiveness of HPFIs used for promoting physical activity in the health care setting?
2. What are preferences of eligible participants of a CLI (chronic ill patients and those with high risk) with regard to form and content of a HPFI added to a CLI and are there individual differences in preferences?
3. Which factors are facilitators or barriers for successful implementation of a CLI in the primary health care setting and which factors facilitate adding a HPFI to stimulate participation in such a CLI?
4. What is the attitude of the general public and the target group of a CLI (chronic ill patients and those with high risk of chronic disease) towards providing a HPFI to stimulate participation in a CLI?

Results

What is known from the research literature about the effectiveness of HPFIs used for promoting physical activity in the health care setting?
In chapter 2 is presented what is known from the literature towards the effectiveness of adding a HPFI to a CLI in relation to behavior change. No positive results of adding a HPFI to a CLI on participation rates and compliance of participants were found in the limited number of studies that fulfilled the inclusion criteria. The included studies did also not take into account the preferences of the participants towards the characteristics of a HPFI, which might have resulted in a mismatch of the preferences of the target group and the offered HPFI and the lack of effect might due to this mismatch. It is recommended to first study the preferences of the target group towards the characteristics of a HPFI before the implementation of the HPFI.

What are preferences of eligible participants of a CLI (chronic ill patients and those with high risk) with regard to form and content of a HPFI added to a CLI and are there individual differences in preferences?
Chapter 3 shows the results of a discrete choice experiment (DCE) in which the preferences towards a HPFI added to a specified CLI were investigated. The potential uptake of the CLI and the different HPFIs varied between 37.9% and 58.8% and the value of the incentive did not significantly influence the potential uptake.

Which factors are facilitators or barriers for successful implementation of a CLI in the primary health care setting and which factors facilitate adding a HPFI to stimulate participation in such a CLI?
In chapter 4 the results of a qualitative study are presented on the perceived barriers and facilitators for successful implementation of a CLI and adding a HPFI. One of the main barriers was the non-committal character of the CLI for the health care professionals and considering that offering a CLI is standard care could facilitate implementation. Opinions towards adding a HPFI to a CLI were diverse and positive HPFIs were preferred over negative HPFIs. Participation rates and limitation of the number of drop outs from the CLI could be positively influenced by a HPFI.

What is the attitude of the general public and the target group of a CLI (chronic ill patients and those with high risk of chronic disease) towards providing a HPFI to stimulate participation in a CLI?
The results of the study as described in chapter 5 showed that preferences varied between DM2 patients who were already more physically active and DM2 patients who were less

physically active with regard to characteristics of a CLI. More DM2 patients who were physically active preferred to receive no reward for participating in a CLI.
In chapter 6 the results of a focus group study are presented on the attitudes towards HPFIs of eligible participants for a CLI and the general public. Both groups had doubts as to the effectiveness of adding a HPFI to a CLI. Also, in both groups positive as well as negative attitudes were found with regard to implementing a HPFI as addition to a CLI.

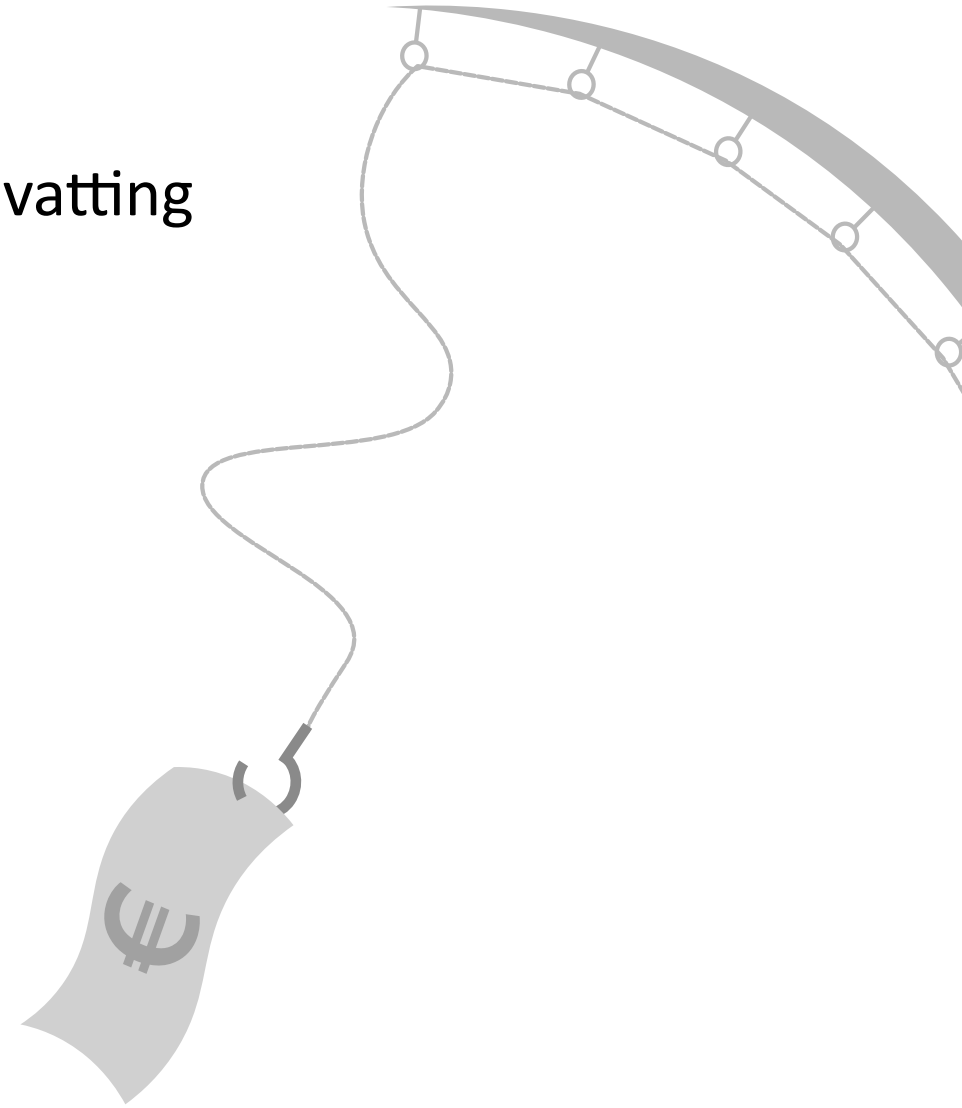
Practical implications

The success of the implementation of a CLI is influenced by many preconditions. By funding selected CLIs in the basic health care insurance, the financial barrier for patients is removed, but is still present for health care providers because the funding is based on a group rate, which requires a certain amount of participants at the same time. However, funding alone will not resolve all issues and before the start of implementing a CLI, other preconditions as motivated health care professionals, a well thought-out design of a CLI, communication between different stakeholders, and a good recruitment strategy have to be met.
There is no consensus yet on who should be responsible for financing HPFIs if they are embedded in the daily practice of health care. It is advisable to calculate potential savings in both health care costs and societal costs if participants get a healthier lifestyle. This might for example interest large companies to finances effective HPFIs for their employees. A healthier lifestyle of their employees might benefit to a reduction of sick days and thereby save the company money.
The form of the HPFI appears to be complex to determine because of the widespread opinions and preferences of all eligible participants. By having a HPFI in the form of a voucher with a certain value, participant can choose the reward by themselves. This might increase the chance of success in the CLI of the participant, because the participant can choose a reward that motivates them to achieve their goals in the CLI, instead of a predetermined reward. Choosing a more individual approach is in line with the concept of patient centered care, which is a central topic in many discussion with regard to quality of care.
Despite the growing number of studies on the effectiveness of HPFIs, ethical issues entailed to the implementation process of HPFIs are mostly not taken into account in these studies. For a successful implementation of a HPFI, ethical issues should to be brought into the open. These ethical issues have to be discussed with the stakeholders, solutions to solve these issues have to be identified and the best case scenario should be implemented.

Conclusion

Despite no evidence could be found for the effectiveness of a HPFI as addition to a CLI, there are indications that a HPFI can be part of the whole set that is necessary to motivate eligible participants to actually participate in a CLI. Opinions on the acceptability diverged and it is necessary to invest in getting deeper insight in the attitude of the stakeholders on implementing a HPFI to a CLI. It is advisable to invest in the preliminary phase of a project to study the preferences of the target population towards the HPFI and CLI, preconditions that have to be met for successful implementation, and the acceptability of the preferred HPFI by health care professionals and the general population. Both practical and ethical issues have to be resolved to enable a successful implementation of a HPFI and a CLI.

Samenvatting



Introductie

Fysieke inactiviteit en ongezonde eetgewoonten zijn risicofactoren voor het ontwikkelen van chronische ziekten. Het percentage van mensen met overgewicht en obesitas stijgt in Nederland en meer dan 50% van de volwassenen in Nederland voldoet niet aan de beweegnormen. Gecombineerde leefstijlinterventies (GLI) kunnen mogelijk een rol spelen om de stijging van het aantal mensen met overgewicht en obesitas te verminderen en in het verbeteren van de hoeveelheid fysieke activiteit en eetgewoonten van deelnemers van de GLI. Een GLI is gedefinieerd als een interventie met het doel om de hoeveelheid fysieke activiteit en de eetgewoonten te verbeteren van deelnemers met het risico om een chronische ziekten te ontwikkelen of deelnemers die al een chronische ziekte hebben welke gerelateerd is aan overgewicht of te weinig fysieke activiteit.
Individuen die geschikt zijn voor deelname aan een GLI zijn vaak niet gemotiveerd om daarin deel te gaan nemen. Een extrinsieke motivatie zoals een financiële prikkel, kan helpen om barrières voor deelname te verminderen. De definitie van een financiële prikkel is een boete of beloning met een geldelijke waarde die gegeven wordt op basis van de prestatie die wordt geleverd op gezondheidsgedrag. In Nederland is er ten aanzien van financiële prikkels nog geen inzicht in de houding en voorkeuren van de eindgebruikers en zorgprofessionals. Het onderzoek wat al is uitgevoerd in andere landen rondom de houding van mensen ten aanzien van financiële prikkels is niet rechtstreeks te vertalen naar de Nederlandse setting. Onderzoek is nodig om inzicht te verkrijgen in deze onderwerpen.

Doel van het onderzoek

De onderzoeksvragen in dit proefschrift waren als volgt:

1. Wat is bekend in de onderzoeksliteratuur over de effectiviteit van financiële prikkels die gebruikt worden voor het promoten van fysieke activiteit in de zorgsetting?
2. Wat zijn voorkeuren van geschikte deelnemers van den GLI (mensen met een chronische ziekte, of met een hoog risico om een chronische ziekte te krijgen) met betrekking tot de vorm en inhoud van een financiële prikkel welke wordt toegevoegd aan een GLI en wat zijn individuele verschillen in deze voorkeuren?
3. Welke factoren zijn faciliterend of belemmerend voor een succesvolle implementatie van een GLI in de eerstelijns zorg en welke factoren faciliteren het toevoegen van een financiële prikkel om deelname aan zo een GLI te stimuleren?
4. Wat is de houding van de algemene populatie en van de doelgroep voor een GLI (chronisch zieke patiënten of met een hoog risico op het krijgen van een chronische ziekte) ten aanzien van het aanbieden van een financiële prikkel om deelname aan een GLI te stimuleren?

Resultaten

Wat is bekend in de onderzoeksliteratuur over de effectiviteit van financiële prikkels die gebruikt worden voor het promoten van fysieke activiteit in de zorgsetting?
In hoofdstuk 2 wordt beschreven wat er bekend is vanuit de literatuur omtrent de effectiviteit van het toevoegen van een financiële prikkel aan een GLI in relatie tot gedragsverandering. Er zijn geen positieve resultaten gevonden in het kleine aantal van studies die voldeden aan de inclusie criteria van het toevoegen van een financiële prikkel aan een GLI op aantal mensen die deelnemen en op de therapietrouw van de deelnemers. De geïncludeerde studies hebben niet meegenomen wat de preferenties van de deelnemers waren ten aanzien van de eigenschappen van een financiële prikkel, wat geresulteerd kan hebben in een **MISMATCH** van de preferenties van de deelnemers van de doelgroep ten aan zien van de financiële prikkel en de aangeboden financiële prikkel. Dit kan een verklaring zijn dat er geen effect is gevonden voor het toevoegen van een financiële prikkel aan de GLI. Het wordt aanbevolen om eerst de preferenties van de doelgroep voor de financiële prikkel te onderzoeken, voordat deze wordt geïmplementeerd.

Wat zijn voorkeuren van geschikte deelnemers van de GLI (mensen met een chronische ziekte, of met een hoog risico om een chronische ziekte te krijgen) met betrekking tot de vorm en inhoud van een financiële prikkel welke wordt toegevoegd aan een GLI en wat zijn individuele verschillen in deze voorkeuren?
In hoofdstuk 3 worden de resultaten gepresenteerd van een discrete keuze experiment waarin de voorkeuren voor een financiële prikkel die wordt toegevoegd aan een GLI zijn onderzocht. De potentiële deelname aan de GLI en de verschillende financiële prikkels varieerde tussen 37,9% en 58,8% en de waarde van de financiële prikkel had geen significante invloed op de potentiële deelname.

Welke factoren zijn faciliterend of belemmerend voor een succesvolle implementatie van een GLI in de eerstelijns zorg en welke factoren faciliteren het toevoegen van een financiële prikkel om deelname aan zo een GLI te stimuleren?
In hoofdstuk 4 worden de resultaten gepresenteerd van een kwalitatieve studie over de ervaren belemmerende en bevorderende factoren voor een succesvolle implementatie van een GLI met daaraan een financiële prikkel toegevoegd. Een van de belangrijkste barrières was dat het aanbieden van een GLI door zorgprofessionals op vrijwillige basis is. Dat betekent dat wanneer het aanbieden van een GLI standaard zorg zou zijn dit de implementatie zou kunnen bevorderen. De meningen over het toevoegen van een financiële prikkel aan een GLI varieerden en er was een voorkeur voor positieve financiële prikkels ten opzichte van negatieve financiële prikkels. Een financiële prikkel kan een positieve invloed hebben op

het aantal mensen wat wil deelnemen aan een GLI en aan het verminderen van het aantal mensen die stoppen met de GLI.

Wat is de houding van de algemene populatie en van de doelgroep voor een GLI (chronisch zieke patiënten of met een hoog risico op het krijgen van een chronische ziekte) ten aanzien van het aanbieden van een financiële prikkel om deelname aan een GLI te stimuleren?
De studie in hoofdstuk 5 laat zien dat voorkeuren voor een GLI verschilt tussen diabetes mellitus type 2 (DM2) patiënten die een hoger niveau van fysieke activiteit hebben dan DM2 patiënten met een lager niveau van fysieke activiteit. Meer DM2 patiënten die fysiek actief waren hebben een voorkeur om geen beloning te ontvangen voor deelname aan een GLI.
Hoofdstuk 6 bevat de resultaten van een focusgroep studie over de houding van de algemene populatie en van mensen die geschikt zijn voor deelname aan een GLI ten aanzien van een financiële prikkel. Beide groepen hebben twijfels over de effectiviteit van het toevoegen van een financiële prikkel aan een GLI en worden zowel positieve als negatieve houdingen gevonden ten aanzien van het toevoegen van een financiële prikkel aan een GLI.

Praktische implicaties

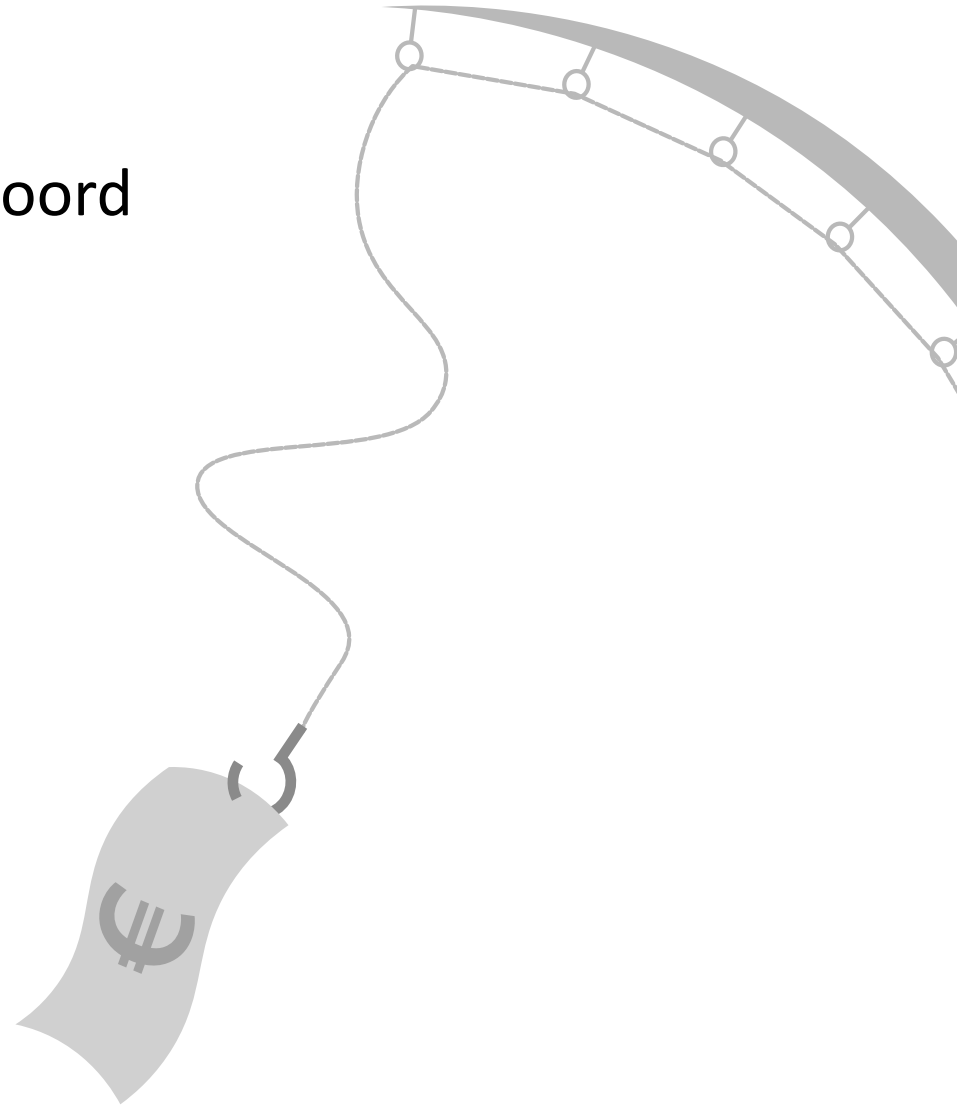
Vele randvoorwaarden hebben invloed op een succesvolle implementatie van een GLI. Door het financieren van geselecteerde GLI's door de zorgverzekering wordt de financiële barrière voor de patiënten opgelost, maar deze is dan nog steeds aanwezig voor de zorgaanbieders aangezien de financiering wordt gebaseerd op groepen, wat vraagt om een minimaal aantal deelnemers in dezelfde periode. Desondanks zal financiering niet alle barrières oplossen en voordat een GLI geïmplementeerd kan worden moeten aan andere randvoorwaarden worden voldaan zoals het hebben van gemotiveerde zorgprofessionals, een goed doordacht design van de GLI, communicatie met alle stakeholders en een goede wervingsstrategie.
Er is nog geen consensus wie er verantwoordelijk is om een financiële prikkel te financieren wanneer dit in de dagelijkse zorgpraktijk is ingebed. Het advies is om de potentiële besparingen te berekenen in zowel de zorgkosten als de kosten in het sociale domein wanneer deelnemers een gezondere leefstijl ontwikkelen. Dit kan interesse wekken van grote bedrijven om effectieve financiële prikkels te financieren voor hun werknemers. Een gezondere leefstijl van hun werknemers kan namelijk bijdragen aan een vermindering van het aantal dagen dat ze ziek zijn en het bedrijf op die manier geld besparen.
De vorm van de financiële prikkel is complex om te bepalen gezien de grote variatie in meningen en voorkeuren bij geschikte deelnemers. Door een financiële prikkel aan te bieden als een voucher die een waarde vertegenwoordigd, kan de deelnemer zelf zijn of haar beloning kiezen. Dit kan de kans op een succesvol resultaat van de deelnemer in de GLI verhogen,

aangezien de deelnemer zelf een beloning kan kiezen welke hem of haar motiveert om zijn of haar doelen te bereiken in de GLI, in plaats van een beloning welke al vooraf vast staat. Het kiezen van een meer individuele benadering past bij het concept van de patiënt centraal zetten in de zorg, wat een structureel onderwerp is in veel discussies over de kwaliteit van zorg.
Ondanks het toenemende aantal studies naar de effectiviteit van financiële prikkels, worden ethische dilemma's die bij de implementatie van een financiële prikkel komen kijken meestal niet meegenomen in deze studies. Voor een succesvolle implementatie van een financiële prikkels, is het belangrijk dat deze ethische dilemma's op tafel komen en met alle betrokkenen worden besproken. Vervolgens kunnen er mogelijke oplossingen worden besproken en kan het best passende scenario worden geïmplementeerd.

Conclusie

Ondanks dat er geen bewijs is omtrent de effectiviteit van een financiële prikkel welke wordt toegevoegd aan een GLI, zijn er wel aanwijzingen dat een financiële prikkel een deel van het geheel is wat nodig is om potentiële deelnemers te motiveren om deel te nemen aan een GLI. Meningen omtrent de acceptatie van een financiële prikkel varieerden en het is nodig om meer inzicht te krijgen in de houding van alle betrokkenen omtrent het toevoegen van een financiële prikkel aan een GLI. Het is aan te raden om in de voorbereidende fase te investeren in onderzoek bij de doelgroep naar de voorkeuren voor een financiële prikkel en een GLI, randvoorwaarden waaraan voldaan moet worden voor een succesvolle implementatie en de acceptatie door de zorgverleners en de algemene populatie van de geprefereerde financiële prikkel. Zowel praktische als ethische bezwaren moeten worden opgelost om een succesvolle implementatie van een financiële prikkel en een GLI mogelijk te maken.

Dankwoord



Het is klaar! Na ruim 6 jaar ligt hier dan het boekje waar het allemaal om draait in een promotietraject, mijn proefschrift. En als je dan het dankwoord kunt schrijven, dan is de finish echt in zicht! Zo'n dankwoord schrijven is hartstikke leuk, maar het addertje onder het gras is dat je altijd wel iemand vergeet. Dus voordat ik de persoonlijke boodschappen opschrijf, eerst deze:

Ik wil iedereen die op enige wijze betrokken is geweest bij mijn proefschrift bedanken voor alle hulp, ondersteuning en bemoedigende woorden. Jullie bijdrage is van enorme waarde geweest voor realiseren van dit proefschrift.

Beste opponenten, **Caroline Baan**, **Frenk van Harreveld**, **Madelon Johannesma, Stef Kremers**, **Gerard Molleman** en **Ingrid Steenhuis**. Hartelijk dank voor het beoordelen van mijn proefschrift en het opponeren.

Ik wil graag mijn promotieteam bedanken: **Ien**, **Wanda** en **Jantine**. Jullie hebben elk op jullie eigen unieke wijze mee geholpen om dit project in goede banen te leiden en tot een goed einde te kunnen brengen. Ik waardeer het enorm dat jullie mij de ruimte hebben gegeven, met name in het laatste deel van het project, zodat ik alle ballen in de lucht heb kunnen houden. Een andere baan, een jong gezin en een proefschrift is nogal een uitdaging en ik heb daar altijd sterk het heft in eigen handen in gehouden. Voor jullie niet altijd gemakkelijk, maar ik ben jullie heel dankbaar dat jullie mij die vrijheid hebben toevertrouwd.

Ien, zoals zoveel onderzoeksprojecten kenmerkt, is dit traject ook niet zonder de nodige hobbels verlopen, maar jij hebt hier altijd in door gepakt. Zonder jouw doortastendheid was het voltooien van dit project een heel stuk moeilijker geworden. Dankjewel voor je vasthoudendheid, al jouw inzet en feedback op alle stukken. Jouw bemoedigende woorden waren echt een steun in de rug, zeker aan het einde van het traject.

Jantine, ondanks jouw overvolle agenda, heb jij altijd de tijd genomen om stukken te lezen, mee te denken en aandacht te hebben voor mij als mens. Daar wil je enorm voor bedanken. Jouw scherpe blik heeft dit proefschrift echt beter gemaakt en jouw

Wanda, dankjewel voor alle tijd die je voor mij hebt gehad. We spraken elkaar wekelijks en tijdens deze gesprekken passeerden allerlei onderwerpen de revue. Uiteraard bespraken we de inhoudelijke zaken van mijn project, maar ook de leukste uitjes in de regio Utrecht om te doen met kinderen, traktaties voor op school en hoe om te gaan met slapeloze nachten die onze bloedjes van kinderen nogal eens veroorzaakten. Ondanks jouw overvolle agenda en het runnen van een jong gezin thuis, had je altijd tijd voor mij en dat heb ik altijd enorm gewaardeerd.

Ik wil graag alle collega's van zowel het RIVM als de Universiteit van Tilburg bedanken voor al hun hulp en steun in dit project. Jullie hebben zó veel voor mij gedaan. Van het organiseren van overleggen met het promotieteam, het geven inhoudelijke ondersteuning, afdelingsborrels en kletspraatjes bij de koffie. Allemaal even waardevol.
Met mijn **KZG collega's** heb ik het enorm getroffen, wat een fijne afdeling om onderdeel van uit te mogen maken.

Simone, in 2011 mocht ik onder jouw leiding mijn afstudeerstage uitvoeren bij het RIVM en ik had mij geen betere begeleider kunnen wensen. Om daarna in de rol van junior onderzoeker nog verder met jou samen te mogen werken heb ik als heel prettig ervaren. Dankjewel voor alle waardevolle dingen die ik van jou geleerd heb en tijdens mijn promotietijd zo goed van pas zijn gekomen.
Lidwien, dankjewel dat je altijd tijd had om met mij mee te denken of gewoon even gezellig te kletsen en wat fijn dat we elkaar nog steeds zien. Op naar nog vele eetafspraken!

Madelon en **Geert**, vanaf het begin zijn jullie vanuit CZ betrokken geweest bij dit project. Bedankt voor al jullie inzet, tijd en mooie discussies. Ook vanuit de **GGD Hart voor Brabant** is altijd betrokkenheid getoond in het project en hebben jullie mij heel goed ondersteund.
Ik wil graag de **medewerkers van Syntein** bedanken voor al jullie inzet om dit project tot een succes te maken. In het bijzonder wil ik graag **Corné** bedanken voor het vertrouwen wat hij had in het project en in mij.

Inmiddels ben ik werkzaam bij het Flevoziekenhuis en het Nederlands Huisartsen Genootschap en heb ik het geluk gehad om ook daar weer fantastische collega's te treffen.

In het bijzonder gaat mijn dank uit naar **Barbara**, mijn leidinggevende in het Flevoziekenhuis. Ik kan mij ons sollicitatiegesprek nog zo goed herinneren. Het was spannend om na ruim 6 jaar in het onderzoek gewerkt te hebben een nieuw pad in te slaan. Jij gaf mij tijdens het gesprek meteen het gevoel dat het goed zat en dat het wetenschapsbureau van het Flevoziekenhuis een goede plek voor mij zou zijn. En wat is dat een goede keuze gebleken!

Ongeveer een jaar geleden kwam de kans om bij het Nederlands Huisartsen Genootschap te gaan werken en dit te combineren met mijn baan bij het Flevoziekenhuis. Een warm welkom, met fijne collega's en ook nog eens heerlijke koffie. Ik kan oprecht zeggen dat ik het ook hier enorm getroffen heb en ik hoop nog lang deel uit te kunnen maken van deze mooie organisatie.

Swanet, jij hebt mij vorig jaar aangenomen bij het NHG en ik heb het enorm getroffen met jou als clusterhoofd. Ik bewonder jouw positieve houding, enorme oplossingsgerichtheid en hoe druk het ook is, er zit altijd een lach op jouw gezicht.
Jacintha, dankjewel voor alle tijd die je voor mij hebt gehad om mij in te werken in de organisatie, maar ook voor de persoonlijke aandacht die je voor mij hebt.

Lieve vrienden en familie ik wil jullie graag bedanken voor alle steun, gezelligheid en leuke uitstapjes die een fijne afleiding waren. Er is ook een leven naast het werk en heb ik het geluk om daarin tijd door te mogen brengen met jullie. Ondanks dat ik in staat ben geweest om een proefschrift te schrijven, heb ik nog steeds geen goed systeem om alle verjaardagen, trouwdagen en andere feestdagen te onthouden. Gelukkig hebben jullie me dit tot nu toe altijd vergeven. Dank jullie wel voor alle fijne momenten samen.

Mirjam, Ferry, Krista, Jet en Ewoud wat is het altijd gezellig om met jullie bij te kletsen. Op naar nog veel meer lekkere etentjes, kerstdiners en andere gelegenheden waarbij samen eten en drinken toch wel een rode draad is.

Maaike en **Arjen**, ook al zien we elkaar misschien niet vaak genoeg, ik ben dankbaar voor jullie vriendschap. **Maaike,** ik ben zo enorm trots op hoe jij in het leven staat. Jij hebt zo een enorme veerkracht en je staat zo positief in het leven. Ik bewonder dat enorm aan jou.

Joyce en **Rob**, wat is het fijn om zulke goede vrienden te hebben. **Joyce**, wij kennen elkaar al vanaf de basisschool en dat is inmiddels al best lang. Dankjewel voor je onvoorwaardelijke vriendschap, ik besef mij goed dat dat heel bijzonder is. **Rob**, we konden het meteen goed vinden met elkaar en ik hoop nog veel klaverjasavonden jouw maat te kunnen zijn.
Maaike en **Joyce**, ons weekendje weg naar Maastricht vond ik zo enorm leuk! Wat wordt onze volgende bestemming?!

Willeke, ik vind het zo leuk dat we elkaar al zoveel jaar zien en het altijd gezellig hebben. OWe zijn opgegroeid als buurmeisjes. Inmiddels wonen we niet meer bij elkaar om de hoek, maar elke keer dat we elkaar zien is het zo gezellig. Je hebt als accountant alle diploma's gehaald die er bestaan. Ik ken niemand die zo ontzettend hard werkt als jij!

En dan mijn paranimfen…**Ellen** en **Eline**. Ik ben enorm dankbaar dat jullie naast mij staan tijdens mijn promotie. **Ellen**, de koppen koffie die wij samen hebben gedronken zijn niet te tellen. Ik ben blij dat we elkaar nog steeds zien en dat gaat altijd gepaard met lekker eten, koffie of taart. Laten we dat nog lang blijven doen!

Eline, bij jouw promotie mocht ik jouw paranimf zijn en hoe fijn is het dat je nu mijn paranimf wilt zijn! Ik heb enorme bewondering hoe hard jij werkt en hoe je de doelen die je stelt behaald. Ik vind het heel fijn dat we ondanks alles, altijd wel iets vinden om samen om te lachen.

Hans en Sylvia, na onze trouwerij vorig jaar mag ik jullie dan officieel mijn schoonouders noemen. Bedankt voor alle gezellige momenten en dat jullie zo'n fantastische opa en oma zijn voor Amber, Julie en Rens.

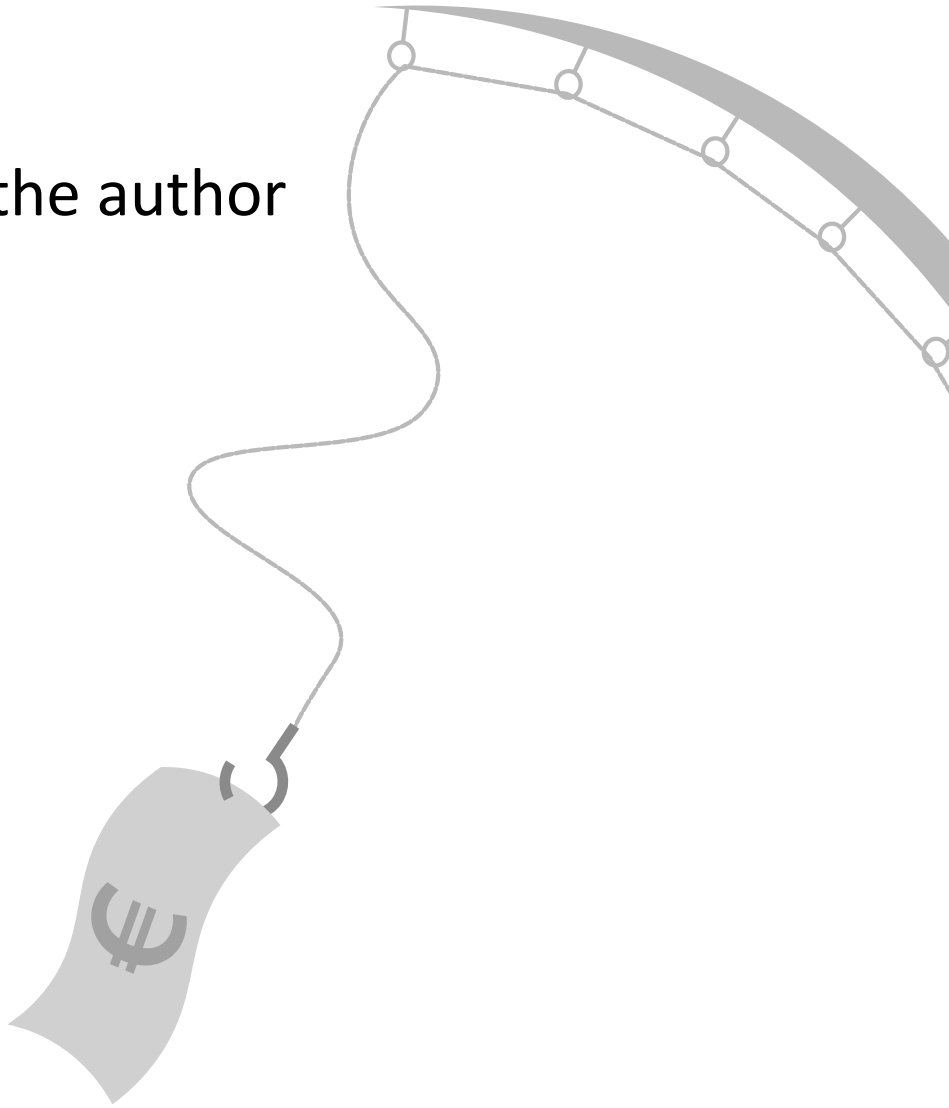
Tijmen, inmiddels ben je niet meer mijn 'kleine broertje' en heb je een grote mensenhuis, een mooie baan en uiteraard Thea de camper waar menig uurtje aan geklust wordt. Dat hele promoveren is dan misschien niets voor jou, maar inmiddels ben je ook ambtenaar (wie had dat gedacht!) en wonen we in dezelfde woonplaats wat ik heel erg gezellig vind.

Pap en **mam**, dank jullie wel voor alles wat jullie de afgelopen jaren voor ons hebben gedaan. Zonder jullie had ik niet alle ballen in de lucht kunnen houden. Altijd interesse in hoe het met mijn promotie ging en altijd bereid om bij te springen als het nodig was.

Lieve **Paul**, vanaf de eerste dag dat ik aan dit project begon stond je naast me. Nooit heb je geklaagd als ik weer eens een extra dag moest werken of in de avond de laptop weer open sloeg. Zonder jou had ik dit niet kunnen doen. Dankjewel voor jouw onvoorwaardelijke liefde, steun en de rust die jij brengt. Waar ik alles op 200% van mijn kunnen wil doen, mag ik bij jou ook 50% zijn. Ik hou van je en kijk uit naar alles wat we nog samen gaan doen.

Lieve **Amber**, **Julie** en **Rens**, jullie zijn de kers op onze taart! Jullie verrijken alle drie op jullie eigen manier mijn leven en ik kan niet wachten om samen met jullie nog veel meer van de wereld te gaan ontdekken.

About the author



Claudia Molema was born on 10 December 1989 in Amstelveen (the Netherlands). After completing her Atheneum at Veenlanden College in Mijdrecht in 2007, Claudia started her study Biomedical Sciences at the VU University. In 2010 she received her Bachelor's degree and started the Master Health Sciences with the specialization Health Policy and Organisation of Health Care. She graduated in 2011. In 2012 Claudia Molema started as researcher at the National Institute for Public Health and the Environment. In 2013 she continued her career by starting her PhD project about financial incentives and combined lifestyle interventions at Tilburg University (Tranzo Scientific Center for Care and Welfare) and the National Institute for Public Health and the Environment (Rijkinstituut voor Volksgezondheid en Milieu (RIVM)). After completing her PhD project, Claudia started working at the Flevoziekenhuis in 2018. In 2019 Claudia started working at the Dutch College of General Practitioners (Nederlands Huisartsengenootschap (NHG)).

Claudia lives in Houten with her husband Paul and their children Amber, Julie and Rens.