

Evaluating community-based health promotion

The application of a holistic evaluation approach to the Healthy Youth, Healthy Future programme



Irma Huiberts

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Colofon

The research presented in this thesis was conducted at the Amsterdam University Medical Center and Mulier Institute.

The research was supported by the national JOGG organisation, funded by the Dutch ministry of Public Health, Welfare and Sport. The national JOGG-organisation had no role the study or writing of the manuscript.

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ISBN: 978 94 93431 22 5

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Printed by Proefschriftspecialist | proefschriftspecialist.nl
Layout and design: Jeroen Reith, persoonlijkproefschrift.nl

VRIJE UNIVERSITEIT

EVALUATING COMMUNITY-BASED HEALTH PROMOTION

The application of a holistic evaluation approach to the Healthy Youth, Healthy Future programme

ACADEMISCH PROEFSCHRIFT

ter verkrijging van de graad Doctor of Philosophy
aan de Vrije Universiteit Amsterdam,
op gezag van de rector magnificus
prof.dr. J.J.G. Geurts,
volgens besluit van de decaan
van de Faculteit der Geneeskunde
in het openbaar te verdedigen
op maandag 7 april 2025 om 11.45 uur
in de universiteit

door

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geboren te Oss

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TABLE OF CONTENTS

Chapter 1	General introduction	7
Chapter 2	Evaluation proposal of a national community-based obesity prevention programme: a novel approach considering the complexity perspective	21
Chapter 3	Untangling the complex implementation process of community-based health promotion: a multiple-case study in the Netherlands	43
Chapter 4	A qualitative exploration of the coordinator's role in an intersectoral childhood overweight prevention programme in the Netherlands: 'a lot is expected from one person'	65
Chapter 5	Uncovering the key working mechanisms of a complex community-based obesity prevention programme in the Netherlands using ripple effects mapping	83
Chapter 6	Evaluating the contribution of a scaled up community-based overweight prevention programme in the Netherlands to children's health behaviours and BMIz	109
Chapter 7	General discussion	129
Chapter 8	Supplementary files per chapter	149
Appendices	Summary	188
	Samenvatting	194
	About the author	202
	Portfolio	204
	List of publications	205
	Dankwoord	210



Chapter 1

General introduction

Many issues faced in society can be considered *wicked problems*. Examples include climate change, inequitable healthcare access and homelessness. Wicked problems continuously change and lack clear boundaries due to their inter- and intra-connectedness with other problems (1,2). Wicked problems are difficult to define and solve. There are no simple solutions for them; they are resistant to change and associated with the conflicting values of the many actors involved. Moreover, there is no definitive solution for wicked problems since it is unclear when the problem is 'solved', and there is always room for improvement.

Public health issues such as the increasing prevalence of obesity, sedentary lifestyles and health disparities are increasingly recognised as wicked problems and driven by numerous interacting social and environmental influences at different levels. In response, public health programmes that target these issues have shifted from solely focusing on individual health behaviours to additionally addressing the social and environmental context in which people live (3–5), including their family and peers, the neighbourhood and institutions that they live and work in, culture and available public services. For example, improving dietary behaviours among children might involve healthier school meals and restrictions on advertising unhealthy foods. Specifically, community-based health promotion programmes are a popular approach for public health promotion (6,7).

COMMUNITY-BASED HEALTH PROMOTION PROGRAMMES

Community-based health programmes target multiple levels and settings in local communities (8,9). They involve different interventions and stakeholders that are relevant in these settings, such as local government, media outlets, public institutions (e.g. schools) and private institutions (e.g. food retailers). Different types of community-based health promotion programmes exist (6,10) and can be broadly divided into two categories based on their main focus (Table 1.1). The first category includes programmes in which the setting or level of interventions is *community-based*, but they primarily target individual behaviour and often employ individual behaviour change strategies. Alternative terms that are commonly used for these programmes include multi-setting or multi-level programmes. The second category focuses on changing the community system itself – such as existing structures, policies and stakeholder practices – rather than only individual behaviours. A key strategy of this type of programme is to build community capacity to address health issues by raising awareness and ownership of a problem in the community and by providing community stakeholders with the support, skills and resources needed to develop solutions and take collective action (11–13).

Given the many interacting factors that affect health outside of the individual, community-based programmes that focus on changing the (community) system are likely to be more effective at addressing population health issues than community-based programmes that primarily focus on individual behaviour change (14). Additionally, these programmes tend to be more sustainable, as the changes that they establish become embedded in the structures of the community system (11,14–16). This thesis centres on community-based programmes that focus on changing the community system.

Table 1.1 Types of community-based health promotion programmes

Type of programme	Main focus	Description
Multi-setting	Individual behaviour change	Interventions implemented in multiple settings (e.g. schools, healthcare and neighbourhood)
Multi-level		Interventions implemented at multiple levels (e.g. individual, community and policy level)
Multi-component		Different types of interventions implemented (e.g. organised sport activities, campaigns and education and policies)
Integrated, intersectoral	Individual behaviour change, community system	Integration of prevention efforts with other actions, policies and business as usual in the health sector and other sectors
Community-based, whole-of-community	Community system	Targeting of multiple levels and settings in the community system through community capacity building
Whole-system approach	The entire complex adaptive system that drives health (including the community)	Focus on the system in which the programme is introduced and directly intervening on the system's structures and goals

The complexity of implementing community-based health promotion programmes

The implementation of community-based health promotion programmes is inherently complex (17). The process of changing the community system is unique to each context, as existing community structures, stakeholder knowledge, attitudes, capacity and relationships vary. Moreover, the process is dynamic and adaptive (18,19), with programme efforts interacting with local stakeholders and evolving in response to changing needs, challenges and opportunities in the community. Outcomes emerge over time throughout this dynamic process. Consequently, the pathways from implementation to change in the community system and individual-level effects consist of many unpredictable and sometimes long and non-linear cause-and-effect chains that may differ across contexts.

Current evidence base for community-based health promotion programmes

Community-based health promotion programmes are considered promising for promoting population health. Previous research has shown that high levels of community engagement in health promotion are associated with improved health outcomes (20) and the sustainability of health promoting environments (21–23), which have in turn been associated with improved health behaviours (24–27). However, the effects of community-based programmes on population health outcomes have often been reported as modest (6,28).

Over the past few years, several best practice principles for community-based health promotion programmes have been identified. First, it is considered essential to build and foster collaboration (29–31) within a diverse, cross-sectoral group of public and private organisations (11,32,33). A common goal, trust and high-quality relationships between these stakeholders are critical for successful collaboration (32–34). In order to successfully foster collaboration, there must be a clear

structure for programme management (11) which clarifies roles and responsibilities (29,35) and maintains regular communication between stakeholders (31). Collaborative partnerships require a coordinator or leader (30,32,33) who is knowledgeable and skilled in fostering collaboration and building capacity among stakeholders (29).

Second, to spur action from stakeholders, it is essential to raise awareness, commitment and ownership for the programme and its goals (29,30,32,33). This should occur at different levels: strategic (political), tactical (organisational) and operational (practitioners; (29,31–33). It is crucial to build the necessary skills, knowledge and capacity among stakeholders to implement actions (11,29,33). Moreover, to sustain actions it is important to embed these into an organisation's policies and regular working processes (11,32). National leadership in intersectoral public health policy can facilitate the involvement of stakeholders or sectors outside of health (35).

Third, programme plans and actions must be sensitive to the local context (33). Plans must be adapted to the community's unique characteristics, needs and available resources (11) and the target group (11,33). In addition, it is crucial to link the programme to other initiatives within the community (11). It should be flexible and continuously adapt to changing needs, opportunities and challenges within the community (11,32,33).

Lastly, several conditions are considered essential for successful implementation of the programme. Financial and human resources should be mobilised and sustained (29,30,33). In addition, programmes should be implemented over the long term, have a realistic timeframe (33) and outline a clear theory of change, with all actions based on the best available evidence (11). Finally, continuous monitoring and evaluation are considered essential for accountability, building evidence (11,29,32) and supporting the adaptive implementation process (33).

CHALLENGES IN EVALUATING COMMUNITY-BASED PROGRAMMES

Community-based programmes that aim to tackle wicked health problems are typically larger in scale and implemented over a longer period of time than simpler interventions that aim to achieve individual behaviour change. Therefore, they require significant investments in human and financial resources. Evaluation and a solid evidence base are essential for determining whether such investments are worthwhile, identifying areas for improvement and scaling up successful programmes.

Despite their potential to address public health issues and wide use in practice, significant gaps in the evidence base on community-based health promotion programmes regarding their effects and working mechanisms remain (6,14,36–38). These gaps are primarily attributable to the unique challenges associated with evaluating community-based programmes, which stem from their complexity. These challenges are discussed below.

Challenge 1: Suitable research designs

Randomised controlled trials (RCTs) are considered the gold standard for evaluating health interventions due to their ability to minimise bias (36,37). However, RCTs, are ill-suited to studying community-based health promotion programmes (36,38). There are several practical issues related to the long term that is required for outcomes of these programmes to emerge, including contamination, insufficient resources and the ethics of randomly assigning or not assigning participants to a potentially beneficial programme over a long period of time (38). More importantly, RCTs have limitations with regard to external validity. They do not account for the fact that the effects of community-based programmes result from the interactions between the programmes and their context (39–41), which may vary across contexts. Thus, while RCTs may measure the individual health outcomes of a community-based programme, they do not adequately assess its effectiveness in real-world conditions (38), which results in evidence that no longer reflects the reality of practice.

Challenge 2: Narrow focus on individual health outcomes

Evaluations of community-based health promotion programmes often solely focus on individual health outcomes (36,40). For example, community-based programmes that are aimed at obesity prevention may be evaluated based on changes in community obesity levels or related health behaviours (e.g. physical activity or dietary behaviour). However, this narrow focus overlooks outcomes and impacts related to the main focus of community-based programmes: changing community systems to promote health.

Although there is recognition that health promotion evaluations should consider broader outcomes and research designs (18,39,40), the current evidence base rarely includes such evaluations. Research on population health promotion programmes remains embedded in a medicalised paradigm that favours RCTs as an evaluation design (40,42). Meanwhile policy makers implement the programmes that are backed by high-quality evidence on visible individual health outcomes (36,40,43). Consequently, simpler individual behaviour change strategies dominate research and practice, as these programmes yield the most univocal results in experimental studies, despite the recognised need for a broader focus on the system that drives health (44,45).

Challenge 3: Understanding the process of community-based health promotion

Evaluating the process from programme implementation to outcomes and impact is important for strengthening causal inferences and evidence related to the programme's contributions (36,46) and is essential for further programme development and for supporting successful implementation (41). However, the complex process from implementation to outcomes and the long-term impact of community-based health programmes has not been extensively investigated (36,40,47–50).

Although process evaluations are employed (40), current practices are often limited to outcome measures such as reach, dose and fidelity (51–53) or changes in predefined outputs (e.g. environmental changes; (36) and have a simplistic and linear representation of the change process (19). Their main focus on predetermined outcomes and programme components leaves little room

for gaining insight on how the programme creates change and interacts with the context in which it is introduced. As a result, current studies provide limited insight on the *how* and *why*: the underlying process, dynamics and contextual conditions that are necessary for changing the community system (14,36,50,54).

ADDRESSING CHALLENGES: A MORE HOLISTIC EVALUATION APPROACH

A more holistic approach to evaluation which considers context, emerging outcomes and the processes that drive changes to the community system is necessary to address the abovementioned challenges and bridge current gaps in the evidence base on community-based health promotion programmes (36,39,40,45). A holistic evaluation approach must be more creative and integrate various research methods. Non-randomised designs such as natural experiments may be used to gain insight into a programme's contributions to individual health outcomes. Furthermore, other methods should be applied to strengthen the evidence base and go beyond questions about individual health outcomes (36,40,41,54), including rigorous qualitative studies that can deepen our understanding of how changes to the community system occur (54) and quantitative or mixed-method approaches that can effectively capture unanticipated and emerging outcomes (40,41). Additionally, a holistic approach requires the use of alternative methodologies that are less common in public health, such as ethnography (19) and case study research, which adopt a more exploratory perspective to comprehend how programmes operate within complex realities.

Although the need for a holistic evaluation approach has been widely acknowledged, there remains a lack of clear guidelines for conducting such evaluations. Indeed, guidance on how to explore whether an intervention works in a given context, how it can be improved and adapted over time (40) and how to integrate various types of research and evidence into a more holistic conclusion is only beginning to emerge (55,56).

COMMUNITY-BASED HEALTH PROMOTION IN PRACTICE: THE JOGG APPROACH

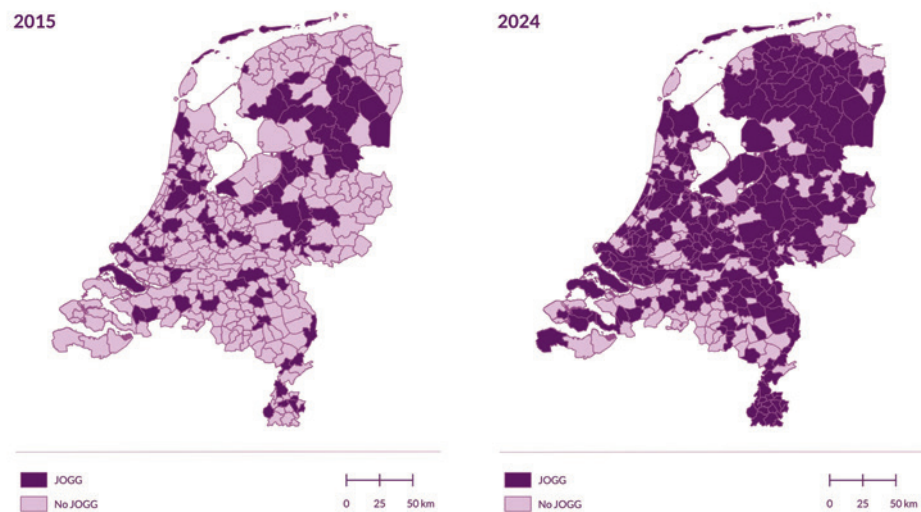
Currently, a widely implemented community-based programme in the Netherlands is the Healthy Youth, Healthy Future (JOGG) approach. JOGG targets children and youth (0–18 years) and aims to create an environment that promotes healthy dietary behaviours and physical activity, thereby preventing overweight and obesity. As a national organisation, JOGG supports local implementation through training and advice. Local coordinators implement the approach in municipalities by building community capacity for child health promotion among local stakeholders across the public and private sectors.

The introduction of JOGG

In 2010, the ministry of Public Health, Welfare and Sport initiated the national healthy weight agreement, a partnership between government, private and public partners that aims to halting the increasing trend of overweight and obesity within the Dutch population. As part of this agreement, the JOGG approach was introduced to target children and youth. It was adapted from an existing community-based programme called EPODE (57–59), which is based on a methodology that was found to be successful at reducing the prevalence of overweight in two French intervention towns (60).

The JOGG approach was deemed promising because it involved coordinated actions across multiple sectors through different types of interventions and in collaboration with local stakeholders. This multi-faceted approach was considered essential, given the wide recognition of overweight as “wicked problem” driven by numerous interacting social and environmental factors (4,61,62). Additionally, JOGG’s foundation in an existing programme backed by several scientific studies (58,60) strengthened its reputation as a promising and evidence-based approach.

Figure 1.1 JOGG municipalities in the Netherlands



Scale-up

The JOGG approach was first implemented in five municipalities in 2010. Over the years, it has significantly expanded (63). In 2015, 91 municipalities implemented the approach; this number reached 214 in 2024, which represents approximately two-thirds of municipalities in the Netherlands. Along with the rise in participating municipalities, the national JOGG organisation grew, and the national government’s investment in the JOGG approach increased (63). Over time, JOGG continued to develop their strategy and expand their support structure. In addition, they further developed the content of the programme, including the core components from the original

EPODE programme. As part of these developments, which are further explained in Chapter 1, JOGG began to place a greater emphasis on community capacity building and programme complexity.

Evaluating the JOGG approach

The JOGG approach faces all of the previously described evaluation challenges. Policymakers have placed significant emphasise on assessing its effects on health outcomes, particularly in preventing childhood overweight (the initial goal of JOGG). As a result, evaluations have primarily focused on these outcomes. They have produced mixed results (64–66) and highlighted various methodological and data-related challenges. Additional process evaluations have mainly assessed implementation fidelity (67–69).

In 2018, several researchers who were involved in advising the JOGG organisation noted the organisation's evaluation challenges and called for the need to consider complexity in the evaluation of their approach (70). They emphasised that, as a community-based programme, the JOGG approach aims to drive changes in the community system to achieve embedded, sustainable actions for obesity prevention. This may involve changes to policies, processes or collaboration structures. Moreover, the nature of these community changes may vary across different contexts and evolve over time.

Given the complex nature of the JOGG approach, the researchers recognised that a more holistic approach to its evaluation was needed. Such an evaluation would not only provide a broader perspective on the programme's potential contribution to population overweight prevention but also offer insights that would support future implementation efforts, including improved understanding of the process of community system change, working mechanisms and conditions necessary for the success of the JOGG approach.

AIM OF THE THESIS

The main aim of this thesis is to gain insights on the implementation, working mechanisms, outcomes and impact of the JOGG approach, which are important for informing its further development and improvement. Additionally, they may inform other community-based health promotion programmes. To consider the complex nature of the JOGG community-based health promotion programme, we adopted a holistic evaluation approach. Throughout this thesis, we illustrate this approach and lessons learned about this approach. By sharing these, we aim to contribute to the development of feasible guidance for the holistic evaluation of other community-based health promotion programmes to enable other researchers, policymakers and programme planners to learn from our insights.

THESIS OUTLINE

In Chapter 2, we present the evaluation framework for this study and discuss how it takes into account the complex nature of the JOGG approach and is therefore suitable for evaluating community-based health promotion programmes. Chapter 3 describes how the JOGG approach interacts with the community context and how different key events have shaped its implementation process over the years. In Chapter 4 we focus on the local JOGG team's role in the implementation process and competencies that contribute to successful implementation. Next, we explore the outcomes and working mechanisms of the JOGG approach in detailed case studies of five JOGG communities in Chapter 5. In Chapter 6, we present findings from a natural experiment approach to evaluate the JOGG approach's contributions to children's health behaviours and weight status. In the general discussion in Chapter 7, we reflect on the impact and outcomes of the JOGG approach based on the study findings in the different chapters. In addition, we share lessons learned on the holistic evaluation approach and discuss potential challenges related to the generalisation of the study results and implementation. Based on the conclusions and lessons learned we formulate recommendations for policy, practice and research.

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Chapter 2

Evaluation proposal of a national community-based obesity prevention programme: a novel approach considering the complexity perspective

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Published in:

International Journal of Behavioral Nutrition and Physical Activity. 2022; <https://doi.org/10.1186/s12966-022-01271-7>

ABSTRACT

Community-based obesity prevention programmes are considered an important strategy to curb the obesity epidemic. The JOGG (Youth At a Healthy Weight) approach is a large-scale community-based programme for childhood obesity prevention in the Netherlands that has been implemented over the past ten years. Practice-based development of the programme, both at the national and local level, increasingly poses challenges for its evaluation. One considerable challenge is the increasing acknowledgement of the complexity in the JOGG-approach, characterized by (a) objectives that vary locally, (b) adaptations to the programme over time in response to a community's shifting needs, challenges and opportunities, and (c) emergent outcomes and non-linear causality.

We propose an evaluation framework that highlights elements of the complex local practice, including the local programme theory, implementation, adaption, the influence of context and feedback loops and intended as well as emergent and unintended outcomes. By studying each of these elements in practice, we hope to learn about principles that guide effective obesity prevention across contexts. The results of the proposed evaluation will inform both practice and research.

Considering complexity in evaluation is a relatively new challenge in public health and therefore an emergent research area. The proposed framework for complex evaluations allows to retrospectively evaluate a programme that was implemented and developed in practice, and enables us to learn from practice-based experiences. Following the ISBNPA Dare2Share initiative, we kindly invite other researchers in the field to share their ideas and experiences regarding integration of complexity in evaluation.

BACKGROUND

Worldwide, obesity is considered a pressing health concern, with immense consequences for population health and economy (1). Over the past decades obesity and overweight prevalence has continued to rise (2,3). In order to stop this increasing trend, a large variety of programmes have been introduced to promote healthy dietary and physical activity behaviours and consequently prevent obesity (4–8).

The strategy of obesity prevention programmes in the population strongly evolved over the past decades. Early strategies were aimed at individual behaviour change (9–11). Informed by socio-ecological frameworks of behaviour, later strategies of obesity prevention acknowledged the importance of environmental factors as drivers of unhealthy behaviour (12,13). Consequently, many prevention programmes implemented multiple interventions aimed at both individual and environmental drivers of obesity in multiple settings in which people live (e.g. neighbourhoods and schools). Community-based obesity prevention (CBOP) programmes (14) became a popular strategy targeting drivers of unhealthy behaviour at the local level, in which local stakeholders play an important role. Interventions in CBOP programmes are developed with and implemented by community stakeholders.

In response to the growing awareness of the complexity of obesity prevention (15), the design of CBOP programmes became increasingly complexity-oriented over the past years (16). In this perspective, complexity refers to the context in which a programme is implemented, rather than (only) a property of the programme itself (17–20). This context is considered a complex system of interdependent and constantly evolving elements. Within this complexity perspective it is acknowledged that the outcomes and impact of a programme are likely to vary between contexts and emerge as the programme interacts with the context. This means that even apparently simple programmes and interventions can result in varying outcomes in different local contexts (17). The extent to which this complexity perspective is integrated within CBOP programmes ranges from dynamic programme adaptations in response to the community's changing needs, possibilities and challenges, to mapping and leveraging the characteristics of the context in order to change the whole obesity driving system (5).

Appropriate study designs for the evaluation of complex programmes are needed. Until recently, evaluation designs for CBOP programmes were commonly (quasi-) experimental designs that solely focus on the effect of the programme or specific programme components on health behaviours or obesity (21). Experimental evaluation designs pose several challenges for complex CBOP programmes (20,22–24), including a strong focus on predetermined and linear causal outcomes and processes, and to a lesser extent on programme development over time and context. As a consequence, much is still unknown about how CBOP programmes impact communities and obesity prevalence, and which mechanisms underly success or failure of such programmes (5,7,21).

In order to address these challenges and support future development of CBOP programmes, an evaluation approach is needed that considers complexity in the evaluation (20,24,25). This approach requires novel types of research questions, a shift in thinking about how a programme contributes to behaviour change and obesity prevalence, and different (application of) research methods to study process and impact. So far, evaluation designs that consider complexity in its research questions and approach have been relatively uncommon in public health evaluation (20,26,27). Some alternative approaches that do provide insight in working mechanisms of complex programmes and the interaction with local context, have been developed in other disciplines, including realist evaluation (28), developmental evaluation (29) and systems approaches (30,31). To the best of our knowledge, their use in the evaluation of CBOP programmes is still limited (21,26).

In this paper we use a practical example of a CBOP programme to explain why alternative approaches to evaluation are sometimes more suitable than commonly used effect evaluations. In addition, we present and share our evaluation approach that considers the complexity of CBOP and actively invite other researchers to deliberate on this. By doing this we aim to contribute to the debate on how alternative evaluation approaches and methods can be applied in the evaluation of complex public health programmes.

We developed the evaluation approach presented in this paper for the evaluation of a national CBOP programme in the Netherlands, the JOGG (Youth At a Healthy Weight) approach, which has been implemented and developed in practice over the past ten years. Evaluation of this programme aims at gaining a better understanding of how the programme successfully contributes to obesity prevention in practice.

COMMUNITY-BASED OBESITY PREVENTION: THE JOGG-APPROACH

Background and core components of the JOGG-approach

The JOGG-approach was based on the French EPODE programme, which had showed promising results for CBOP (32,33). EPODE describes four core components that should be implemented in collaboration with community stakeholders: i) generating political commitment, ii) establishing public-private partnerships, iii) using social marketing techniques and iv) monitoring and evaluation (32,34). Each local JOGG-community used these core components to support community engagement and collaboratively create a more 'healthy environment', thereby stimulating children's healthy lifestyle in order to prevent childhood overweight and obesity. Community stakeholders were to be involved even they do not have a specific objective in public health (e.g. spatial planning sectors in local government or restaurants) with the premise that health should be considered in all policies. See van Koperen et al. (34) for the full logic model of the EPODE programme. The JOGG-organisation added the component 'connecting prevention and care' to this model, to encourage JOGG-communities to link interventions and stakeholders involved in the care for overweight children to overweight prevention efforts in the community.

Much is still unknown about how and for whom these EPODE-based or similar CBOP programmes work. Recent studies show mixed results (4,7,8,35,36), which may be due to the large heterogeneity between the programmes, the diversity of contexts in which they were implemented, and heterogeneity in evaluation designs and research methods. The core components of EPODE were at the time developed based on existing theories (37) and practice (34). Few studies have since then focussed on further studying the core components or causal links between the core components and intended outcomes (21,38).

Organisation structure: A national JOGG-organisation and local JOGG-communities

The JOGG-approach is planned and implemented both at the national and local level, which enables influencing both macro-environmental structures (e.g. policies within the national sports sector or food sector) as well as local environmental settings (e.g. in schools and local government). The national JOGG organisation, funded by the Dutch government, creates awareness about childhood overweight and a healthy lifestyle, develops partnerships, lobbies and implements actions at the national level. In addition, the national organisation is responsible for the strategic development of the local JOGG-approach.

At the local level a JOGG-team, consisting of a local JOGG-manager and policy officer, coordinates the development and implementation of the JOGG-approach. A local action plan is developed that fits the local context, challenges and possibilities (for example local demographics or political environment). This action plan is developed in collaboration with community stakeholders (e.g. schools, welfare organisations, sports clubs or private partners).

JOGG-communities are supported by the national organisation. Support structure includes personal support from JOGG advisors and coaches, ready-made communication and campaign materials, road maps and knowledge exchange in an online portal, training sessions and network meetings. The national organisation does not provide financial support, the local JOGG-team is responsible for mobilizing their own (financial) resources.

Development of the JOGG-approach: 10 years in practice

The JOGG-approach was first implemented in 2010 in the Netherlands as part of a national healthy weight agreement, a partnership between government, private and public partners, initiated by the ministry of Public Health, Welfare and Sport. To date, JOGG is an independent organisation and more than 170 Dutch municipalities are implementing the JOGG-approach.

Since the start in 2010, the national JOGG-organisation has continued to develop the JOGG-approach based on (1) practice-based experience in different communities, (2) knowledge exchange within the EPODE international network, and (3) collaboration with scientific partners. Over the years, the JOGG-approach developed from a multi-component programme into a CBOP programme, that builds on a socio-ecological model of health, community capacity building and

recognizes the complexity of the context in which it is implemented. These changes reflect the development of CBOP programmes overall.

From targeting children individually to targeting children's environment

Over time, the national JOGG-organisation gradually shifted focus from targeting the individual child to targeting children's environment. The first years, the JOGG-approach mainly included implementing standardized social marketing materials (e.g. campaigns, events and activities that raised awareness and knowledge about health behaviours) in order to accomplish behavioural changes at the individual level. Later, the national JOGG-organisation started focussing on identifying and targeting environmental properties that drive children's health behaviours at the local level such as schools food and drink policies and neighbourhood playgrounds. JOGG removed the core component 'using social marketing techniques' from their programme logic model. Creating the healthy environment became the core aim of the approach.

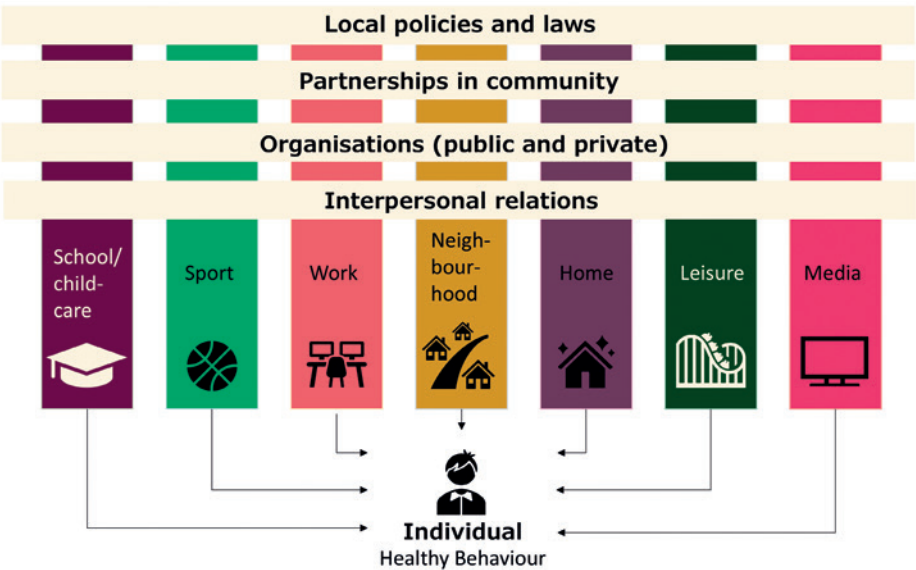
To date, the JOGG-organisation defines seven **settings** in children's environment: family, school and child care, neighbourhood, sports clubs, leisure time settings (e.g. playgrounds or parks), work and media. The national JOGG-organisation recognises different **levels** of influence within these settings (see Figure 2.1), which correspond with existing ecological models for health promotion (39). The first level is the individual level: children's behaviour, awareness, knowledge, attitudes and skills. Children's direct social connections, for example family, peers and professionals (e.g. teachers) form the second level. The third level includes the formal and informal organisations which are present in children's environment (e.g. schools, health services, voluntary agencies or religious organisations) and their policies and practices. The fourth level, the community level, is the community structure in which these organisations operate. For example the role of each organisation in the community, resource distribution, relations and collaborations between these organisations. This structure influences practices within the organisations, for example whether children at risk for obesity are identified and referred to fitting care. Lastly, the community and its organisations operate in a wider context of local policies and laws, the fifth level. Practices and processes on each level are inherently related and are ideally considered collectively when targeting children's environment.

From collaboration in partnerships to community capacity building

From the first years onwards, stakeholders in the community (e.g. schools or food retailers) were involved in the implementation of activities, interventions and campaigns planned by the local JOGG-team (40). Over the past five years, the JOGG-approach focus shifted to more structural community involvement through community capacity building, as shared ownership was added as a new core component in the approach. Community capacity building includes creating awareness and shared ownership of a problem in the community and providing stakeholders with support, skills and resources to develop solutions and take action together (41–43). By building capacity among enthusiastic leaders within local stakeholder organisations in children's environment, enthusiasm and ownership is spread, and thereby capacity for action can diffuse through whole organisations. Ideally, community stakeholders do not solely support or implement actions, they

initiate, develop and manage actions from or within their own organisation, based on their insights and experiences. This ensures that the approach fits the local needs and challenges and that actions are sustained. Implementation of the JOGG-approach by the JOGG-team changed from implementing activities and interventions to community capacity building: creating a network of community stakeholders, encouraging and facilitating them to take action and maintaining an overview of the network and its (collaborative) actions to ensure coherence and contribution to the overall goals of the local approach.

Figure 2.1 settings and levels in the healthy environment targeted by the JOGG-approach



A growing recognition of complexity

The EPODE logic model on which the JOGG-approach was based (34) illustrates a linear theory of behaviour change. Over time, the JOGG-approach integrated a growing recognition of complexity: it appeared to be not only tailored to the local context in the design phase of the local programme, it also adapted over time. The local JOGG-team is increasingly encouraged to be responsive to changing needs, opportunities, challenges and (unintended) outcomes and to adapt the approach as needed (40). As a consequence the local JOGG-approach is continuously changing and new objectives and actions emerge over time.

In line with this, the complex causality between the JOGG-approach, the context in which it is implemented and changes they aim to bring about throughout different settings and levels of children's environment is recognised by the national JOGG-organisation (44). The stakeholders and organisations within these settings are not passive or isolated recipients of the JOGG-teams efforts. They exist within a wider context and interact with each other. Consequently, the causal pathway

from planning and implementation to individual-level effects consists of many, unpredictable and sometimes long mutually reinforcing and non-linear cause-effect chains, that may differ across contexts.

EVALUATING THE JOGG-APPROACH

An appropriate evaluation approach

As is the case with many other CBOP programmes (5,7,21), evaluations of the JOGG-approach have so far consisted of summative and formative evaluations, with research questions mainly directed at monitoring implemented activities, evaluating whether programme components were implemented as intended (45,46) and evaluating whether the programme worked to accomplish the predefined outcomes, specifically on overweight and obesity prevalence (47–49). Such evaluation approaches are less appropriate for the current evaluation, which aims to gain a better understanding of how the programme works in practice. First of all, because these evaluation approaches produce limited information on how the programme works. The main focus on predetermined outcomes and programme components hardly leaves room for building an understanding of why a local programme's implementation is or is not successful and learning from practice-based programme development.

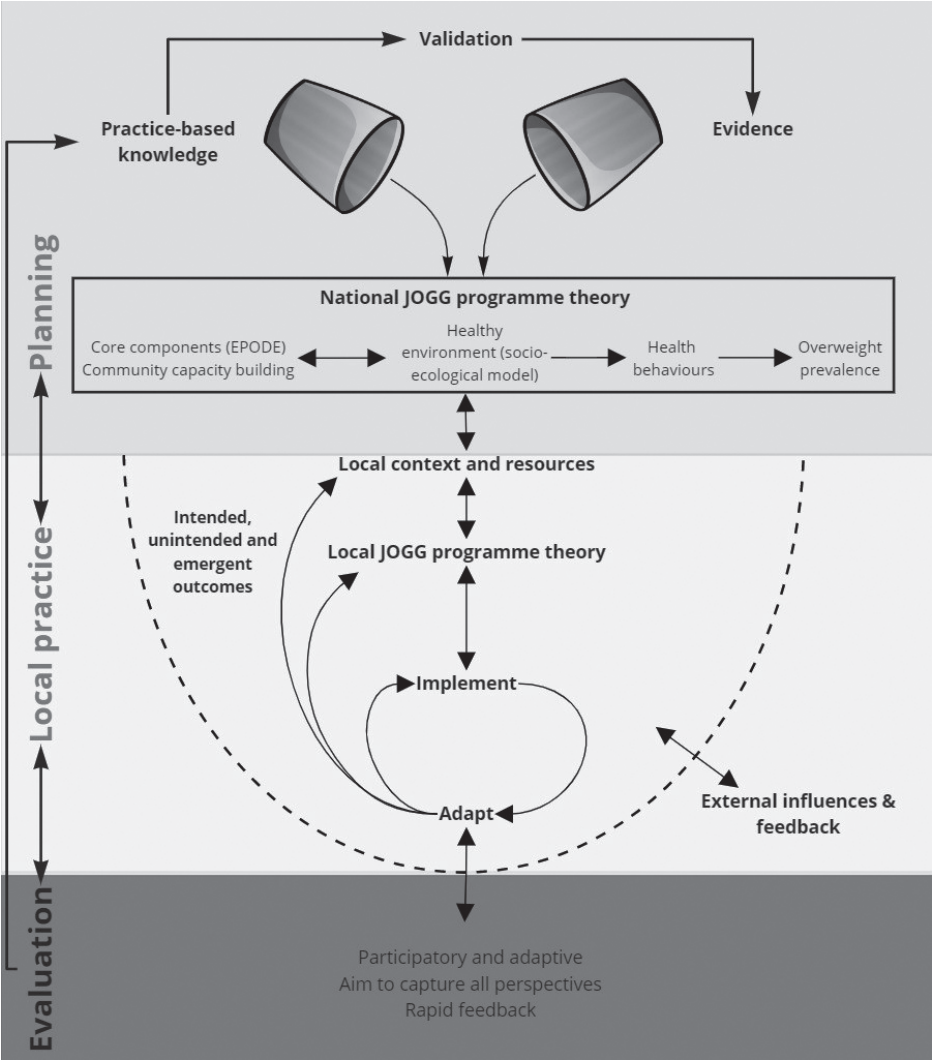
Second, past evaluations have done little justice to the inherent complexity of the JOGG-approach. Specifically, programme development at the local level and necessary adaptations during implementation were not acknowledged in evaluation. An evaluation approach and corresponding research questions that values adaptive implementation as a key component of the JOGG-approach and enables learning from local successes and failures is more suitable.

Further, the focus on solely predetermined outcomes and programme components is not sufficient. Due to the adaptive nature of the programme and varying contexts in which it is implemented, it may focus on issues or objectives that are no longer relevant and overlook unanticipated programme developments or outcomes. A broader perspective is required to consider all potential consequences of the JOGG-approach, on different levels in the community, including emerging or unintended outcomes and non-linear causal relations.

Evaluation framework

As a foundation for the evaluation of the JOGG-approach we use the conceptual model of Jolley (23). This model addresses the challenges of evaluating complex community-based health promotion, including the role of evaluation to support future development of a program, by building on theory based evaluation (50,51), complexity theory (18,52) and developmental evaluation (29). The model provides a framework in which the JOGG-approach is recognised as a complex and adaptive process, regardless of the complexity of the programme itself (Figure 2.2).

Figure 2.2 Evaluation framework of the JOGG-approach, adapted from Jolley (23)



The planning phase in the model specifies the overarching JOGG programme as intended by the national JOGG-organisation, which is based on scientific evidence and practice-based knowledge. In each JOGG-community (local practice) the national programme theory is tailored to the local context and resources and is then implemented. By 'implementation' in this framework we mean the implementation strategies (53), all methods or techniques, that are employed by the JOGG-team to bring the programme theory into practice, in order to reach intended outcomes. This is considered a continuous and adaptive process, influenced by external factors and feedback loops. Evaluation supports both local and national developments of the JOGG-approach. Rapid feedback

to stakeholders supports the adaptive implementation process at the local level. In accordance with Jolley's model, the evaluation aims to capture perspectives of all stakeholders involved in the local approach (e.g. policy officers, private partners, professionals, target groups). Their experience and knowledge is considered a valuable source of information about the implementation process and outcomes of the local JOGG-approach. Evaluation results from the local level will feed back to the national level to support further programme development through practice-based knowledge. Compared to Jolley's original model we added the 'validation' arrow from practice-based knowledge to evidence. When sufficiently validated, lessons from practice fill the 'evidence' bucket on which programme theories of CBOP programmes are based. Evaluation studies across different context contribute to the validation of practice-based knowledge (23,25,29).

Research questions, design and methods

Research questions, design and methods for the evaluation (Table 2.1) are derived from the components of the model in Figure 2.2 and its underlying theories. The evaluation of the JOGG-approach will consist of two phases. Phase 1 will focus on collecting knowledge from local practice. The second phase of the evaluation will then focus on validating practice-based knowledge.

Table 2.1 Research questions and methods for the evaluation of the JOGG-approach

Components framework	Research questions	Methods
National JOGG programme theory	Is the national programme theory based on the best available evidence and knowledge?	Document analysis
	Is the national programme theory likely to contribute to the intended outcomes?	Focus groups with national programme coordinators
Phase 1 Practice-based knowledge: multiple case studies		
Local JOGG programme theory	What is the local programme theory (outcome goals, how goals are to be accomplished, implicit and explicit assumptions about how the programme works)?	Interviews and focus groups with JOGG-team
	To what extent is the national programme theory translated into local programme theory?	Document analysis
	Is the local programme theory likely to contribute to the intended outcomes?	
Local context, resources	How did the local context and local resources influence the translation of the national programme theory into the local programme theory?	Interviews and focus groups with JOGG-team
Implementation	How does the local JOGG-team implement the JOGG-approach to accomplish goals? (strategy and concrete actions)	Interviews JOGG-team Critical Event Card
Adaption	In what way did the local programme theory and the local JOGG-teams implementation strategy change and emerge over time?	Interviews JOGG-team Critical Event Card
		Document analysis

Table 2.1 Continued

Components framework	Research questions	Methods
External influences and feedback	What key internal and external factors influenced implementation and adaption? What feedback loops influenced implementation and adaption?	Interviews JOGG-team Critical Event Card
Intended, emergent and unintended outcomes	Which planned outcomes at different levels in different settings of the healthy environment were accomplished and which were not? What outcomes emerged at different levels in different settings of the healthy environment over time? What were unintended outcomes at different levels in different settings of the healthy environment? What structural outcomes were realized at different levels in different settings of the healthy environment, and what outcomes were not sustained? What were the key internal influences, external influences and feedback loops that hindered or facilitated (structural) outcomes?	Ripple effects mapping Document analysis
Practice-based principles for effectiveness	How did the local JOGG-approach in practice (process of planning, implementation and external influence and feedback) contribute to the identified intended, emergent and unintended outcomes in the community?	Interviews JOGG-team Critical Event Card Ripple effects mapping Comparative analysis of findings in different local contexts
Phase 2 Validating principles for effectiveness		
Validation of principles for effectiveness	What principles guide effective action to accomplish a more healthy environment on different levels within JOGG-communities across different contexts?	To be decided

Phase 1 practice-based knowledge

Following the planning and implementation process in Figure 2.2, the first research questions in phase 1 of the evaluation focus on the feasibility and validity of the JOGG-approach's programme theory at both national and local level. Research questions include whether the national and (explicit or implicit) local programme theories are feasible, logical, likely contribute to childhood obesity prevention, based on the best available evidence and knowledge and what context and resource factors influenced the local translation of the national programme theory. The answers to these questions will provide insight in whether national programme theory successfully guided programme planning in local practice and whether a local programme is likely to yield results.

After this first step we address what lessons can be learned from local implementation and adaption and how they were influenced by external influences and feedback. Research questions appropriate for this step focus on what internal and external factors influenced the implementation process and in what way the local programme was adapted in response to emergent issues. The answers to these research questions will help us to unravel what (combination of) elements of the adaptive implementation process (e.g. adjustments to the approach, responses to internal or external factors) contribute to successful implementation and eventually outcomes in the community.

In order to gain insight in the impact of the JOGG-approach on the 'healthy environment' in the community, an essential aim in the national programme theory, the research questions focus on identifying outcomes on different levels in the healthy environment (policy, community, organisational). Intended outcomes as well as unintended and emergent outcomes are taken into account. Intended outcomes are the goals as defined in the national and local programme theory. Emergent outcomes are outcomes that emerge in response to external factors or during the implementation process, for example when new goals are developed through collaboration with stakeholders (54). Unintended outcomes can for example occur when the response to a programme depends on the context (18). Since the JOGG-approach aims for structural impact in the community, we specifically focus on structural outcomes of the JOGG-approach.

In the last step in phase 1 of the evaluation we focus on the extraction of practice-based principles for effectiveness, those elements of the local JOGG-approach and adaptive implementation process that contributed to the accomplished outcomes in the community. Taken together, the answers to the research questions in phase 1 provide insights in the success of the adaptive planning and implementation process, the external factors that played a role and the outcomes that were accomplished through this process. In this last step we critically review the JOGG-approach's contribution to these outcomes. The principles of effectiveness that are identified in this phase of the evaluation fill the 'practice-based knowledge bucket' from which the national JOGG-organisation informs their programme theory. Validating these principles across contexts is part of phase 2 in the evaluation

Design and methods

In order to answer the research questions in phase 1, we use a multiple case study design. Such a design is suitable for studying dynamic programme implementation and development within the real-life context, from multiple perspectives (55). The large number of communities using the JOGG-approach makes it possible to do multiple case studies, considering one community as a case, and to identify principles for effectiveness that work across a range of contexts. In the multiple case studies we will use qualitative methods to answer the research questions. Qualitative methods are well suited to collect new information on what happens and why (56). Iteratively, qualitative data will help us understand how the programme unfolded in a community and how it contributed to outcomes (57).

Research questions regarding the local programme theory will be answered applying document analysis of local programme documents and interviews with the local JOGG-team. Then, two recently developed methods will be applied to shape data collection and analysis to answer the research questions regarding implementation, adaption, external influences and outcomes, i.e. Ripple Effects Mapping (58) and the Critical Event Card (59,60). Both methods involve the participation of relevant stakeholders by sharing their knowledge and experiences, thereby providing insight in the complex interplay between implementation, context and outcomes. The Critical Event Card tool specifically provides insight into how and why the local JOGG-approach developed over time (59,60), through the analysis of the critical events that characterize the evolution of the complex and adaptive programme. Ripple Effects Mapping (58) focusses on the outcomes of the JOGG-approach. This method was specifically designed to evaluate both intended and emergent outcomes of community-based programmes, across different levels in the community. It involves a group session in which different community-stakeholders participate to provide their perspective on the outcomes and collaboratively explore the contribution of the JOGG-approach.

Analysis: explanation building and principles for effectiveness

From each case community, practice-based principles for effectiveness will be formulated: the underlying principles that contributed to effectiveness in the local context and may provide guidance for effective action in other contexts (23,29). These can be formulated through the process of explanation building, which constitutes building a causal explanation about how and why certain outcomes have occurred in a case (61). The answers to the research questions in the framework regarding local programme theory, implementation, adaption, outcomes and context, resources, external influences and feedback loops at play in each case study help build this explanation. Explanations can be visualized using a systems-based logic model (62–64), which provides insight into the complex causal relations between programme components, outcomes and their interaction (with context). By iteratively comparing explanatory propositions and the logic model from a case with findings from new cases, we expect to be able to gradually refine the model, for example by adding or unpacking components or processes (62).

The principles for effectiveness form a set of hypothesis that can be validated in the second phase of the study. Principles should eventually provide simple and pragmatic guidance for action (65) for effective community-based obesity prevention across contexts (29). This means identifying those (combinations of) programme components that underly significant and/or structural impact in communities, for example because they set into motion a reinforcing feedback loop. To be generalizable across contexts, principles should describe the function of a programme component or action, rather than the exact form (18,66–68). For example, rather than formulating the action ‘organising stakeholder meetings’ a principle should provide insight in the function of this action, for example ‘building a trusting relationship with and among community stakeholders’. The exact formulation of principles for effectiveness remains to be debated and we believe it is relevant to further discuss, share ideas and experiment with different approaches. Principles could for example be formulated as simple guidance for action (e.g. ‘ensure visibility of stakeholders’ successes to other

stakeholders') or include more complex hypothesis on the causal relations between programme components, context factors and outcomes (e.g. as a causal loop diagram or parts of the systems-based logic model).

Phase 2 validating principles for effectiveness

The second phase of the study focusses on the validation of the formulated principles for effectiveness. In this phase, additional qualitative or quantitative data may be collected. Principles may be validated using more traditional summative evaluation questions and methods. The decision on the specific methods for the second phase of the evaluation will be taken depending on the results of phase 1. The evaluation approach itself is in this way responsive to the emerging understanding of the programme through evaluation (23,29,67). It remains to be debated how to adequately consider complexity in this phase of the study, especially when applying more traditional summative methods for evaluation.

DISCUSSION

We have proposed an evaluation approach for the JOGG-approach, a large scale community-based programme for childhood obesity prevention in the Netherlands. The evaluation of comparable programmes has been challenging, given their complexity. Which is characterized by objectives that vary locally, adaptive programme developments over time, emergent outcomes and non-linear causality. We argued that with the aim to learn about the programme components that successfully contribute to obesity prevention, the focus on only predetermined programme components and outcomes in evaluation is insufficient. The current evaluation proposal therefore focusses on the whole adaptive implementation process. The presented evaluation framework includes research questions that focus on the national and local programme theory, implementation, the interaction with local context, both intended and unintended outcomes and adaption. By focussing on these components, using complexity sensitive qualitative research methods (e.g. Ripple Effects Mapping), we aim to extract practice-based knowledge about effective principles of the programme. We expect that these principles can be used to further develop the programme and further research can focus on validating these principles for effectiveness.

The framework will be applied retrospectively, which comes with some limitations. Indeed, it is subject to several threats to the validity, including recall bias in stakeholders and selection bias due to poor documentation or staff turnover (61). Clearly, the risk of bias increases when the period covered in the framework increases. As some communities have implemented the JOGG-approach for over ten years, this may result in spurious causal inferences about the contribution of the JOGG-approach to outcomes in the community. In order to mitigate potential biases, several methodological elements are incorporated in the framework. First, combining data sources and methods (document analysis and interviews with different and purposively selected stakeholders) aims to increase the accuracy, as different perspectives on the same event they can be checked against each other (61). Second, the use of timelines within the interviews helps situating participants in the past (59) and the use of the Critical Event Card tool within analyses allows

to separate material evidence of events from stakeholders' experiences and compare these (60). Further, when identifying principles for effectiveness, cross-case analysis and explanation building are important analytical techniques to make evidence based and correct causal inferences in case studies (61). The second study phase is explicitly aimed at validating formulated principles for effectiveness.

Despite the limitations of retrospective research, the application of the proposed framework provides valuable information. Given the fact that much is still unknown about the factors underlying success and failure of such programmes (5,7,21) and the impact and sustainability of these programmes in the long run (69), the expected results of the proposed evaluation, i.e. the principles for effectiveness, address some highly relevant gaps in the body of evidence of CBOP programmes. The evaluation of the JOGG-approach, which has been implemented in many different community contexts over the past 10 years, provides a unique opportunity to unravel these factors and their complex interplay (with context).

The application of a complexity perspective on the evaluation of public health programmes and interventions is not new. Over the past years different approaches and methods have been developed and applied (26,30), for example system mapping and modelling, network analysis and the use of a complexity perspective as a lens in qualitative data analysis (57). The proposed evaluation of the JOGG-approach however, does differ from what has been developed so far in several ways. First, existing complex evaluations mostly build on the premise that the programme was or will be designed with a complexity perspective in mind (70,71). Like many other CBOP programmes however, the JOGG-approach was originally designed as a 'simple' programme, in which over time a greater acknowledgement of complexity was integrated. The proposed evaluation provides an opportunity to evaluate the JOGG-approach, a programme that was not specifically designed from a complexity perspective. The proposed evaluation approach may therefore be relevant for many other CBOP programmes.

Second, most existing evaluation methods and approaches that consider the complexity perspective, require to follow changes in a community system from before the start of the programme to draw conclusions about system changes over time. However, as programmes and policies are also developed in practice, without involvement of researchers in its development and implementation, other methods are also needed (25). The proposed evaluation of the JOGG-approach is suitable to evaluate a programme that, like the JOGG-approach, was developed in practice and learn from the adaptive implementation of the programme.

Third, existing complex evaluation methods and approaches that consider the complexity perspective rarely facilitate the translation of the findings to programme planners and decision makers (26). The proposed evaluation of the JOGG-approach is specifically aimed at generating results that inform programme planners, policy makers and health promotion practitioners to further improve the programme as well as scientist to inform the development and implementation of other CBOP programmes.

CONCLUSION

The evaluation proposal described in this paper takes into account the complexity of a CBOP programme and is designed to provide insight in how the programme works. Such approaches to public health evaluation have not been given much priority in the past, and only limited guidance exists in how to apply such perspective (27). By sharing our evaluation approach we aimed to contribute to the necessary debate and progress in this area.

Our approach is yet to be tested, and requires further specifications and developments, for example on how principles for effectiveness can best be unravelled and validated. We therefore call on other researchers to share their ideas, trials, reflections and lessons. The evaluation of complex CBOP programmes, or complex health promotion in general is not easy and relatively new, sharing ideas, approaches and lessons will support the development of appropriate and feasible evaluation approaches and methods.

Abbreviations

CBOP: community-based obesity prevention

JOGG (Jongeren Op Gezond Gewicht, Dutch): Youth At a Healthy Weight

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Chapter 3

Untangling the complex implementation process of community-based health promotion: a multiple-case study in the Netherlands

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Published in:
Health Promotion International. 2024;
<https://doi.org/10.1093/heapro/daae005>

ABSTRACT

Community-based programmes are a widely implemented approach for population health promotion. Due to the context dependent and dynamic nature of these programmes, evaluating their implementation is challenging. Identifying key events in the implementation process in evaluation could enable us to support future implementation, while acknowledging the complexity of real-world implementation. We studied the nationwide implementation of the Dutch Healthy Youth, Healthy Future (JOGG) approach, a community-based programme for childhood overweight prevention. The aims of our study were (1) to gain insights into the implementation process of the JOGG approach, and (2) to identify key events that influenced said process. In nine communities, we conducted interviews ($n = 24$) with coordinators and stakeholders involved in the implementation of the JOGG approach and collected documents on the programme's implementation. We applied the analytical tool 'Critical Event Card' to identify key events in the implementation process. Results showed that in 5–10 years of implementing the JOGG approach, communities have undergone different phases: preparation, upscaling, resource mobilisation, integration with other policy initiatives, and adaptation of the implementation strategy. Key events influencing the implementation process included national policy developments (e.g., new health programmes), framing of the JOGG approach in local policy, staff turnover, and coordination teams' experiences and actions. Furthermore, changes in implementation were often triggered by the destabilisation of the implementation process and linked to opportunities for change in the policy process. The identified key events can inform future implementation of the JOGG approach as well as other community-based health promotion programmes.

BACKGROUND

Community-based health promotion programmes are a widely implemented approach for population health promotion (1,2). The aim of such programmes is to mobilise community stakeholders from various sectors as well as community members to (co-)create actions for health promotion that fit the local situation (2,3). A profound element of community-based programmes is community capacity-building (3), which involves creating awareness and shared ownership for health promotion among community stakeholders and facilitating them to take action (4,5).

The 'Healthy Youth, Healthy Future' (JOGG) approach is a nationwide community-based health promotion programme that has been implemented in the Netherlands since 2010 (6–8). The JOGG approach is aimed at preventing childhood overweight and promoting physical activity and healthy diet. JOGG engages relevant stakeholders in children's environments (e.g., schools, sports clubs, and neighbourhoods) and supports them in taking ownership and developing actions for health promotion. Currently, the national JOGG organisation supports over 200 communities, in which a local coordination team is responsible for implementing the JOGG approach.

The implementation of a community-based health promotion programme, such as the JOGG approach, is a complex process, as opposed to the delivery of fixed programme elements (9). The national programme is tailored to the local resources and context. The context includes all of the characteristics and circumstances in which the programme is embedded (10), such as the political, cultural, and organisational contexts (e.g., collaboration structures). Community capacity-building is an iterative process that involves trial and error and adaptations to changing needs, opportunities, and challenges in the community context. Health promotion actions that result from community capacity are developed with local stakeholders.

Since the implementation of community-based programmes is complex, critical elements are challenging to identify and evaluate (11,12). The implementation – that is, the entire process through which a programme is operationalised in a community, from the decision to adopt the programme to its sustainment (10) – differs for each community. What can be defined as a successful implementation depends on the context as well as changes throughout the implementation process. Consequently, much is still unknown about how to support the optimal implementation of community-based programmes (13,14).

Evaluation approaches for examining the complex implementation process of community-based health promotion programmes are currently relatively scarce (15,16). Evaluations of the implementation of these programmes have commonly focused on measures such as reach, dose and fidelity (12,17,18). Such evaluations consider implementation to be a fixed delivery, as opposed to a dynamic process, and context to be a background variable, as opposed to being inherently related to programme implementation (12,17). Consequently, such evaluations are less suitable for studying the complex implementation process of community-based health promotion programmes (15). To gain an enhanced understanding of the implementation of such programmes,

acknowledging their context-dependent and dynamic nature is vital. This perspective can help to determine how the implementation process can be supported and optimised (9,15).

A potentially suitable evaluation approach for gaining insights into this complex implementation process is the Critical Event Card (CEC), an analytical tool developed by Figueiro et al. (19). The CEC aims to provide insights into how the interactions of a programme and context shape a programme's implementation and transform through a series of critical events. Through identifying critical events, this tool may provide an enhanced understanding of how the programme has been implemented over time – in interaction with the context (12,20).

This study aimed (1) to gain insights into the complex implementation process of the JOGG approach, and (2) to identify key events that have influenced its implementation.

METHODS

Study design and analytical approach

We followed a multiple-case study design, for which the CEC and its concepts formed the basis. Drawing from actor network theory (21) the CEC conceptualises the programme and the context as dynamic networks composed by intertwined human actors (i.e., people or groups of people) and non-human actors (e.g., resources). The programme and the context in which it is implemented continuously interact, resulting in changes in both. The CEC aims to identify and analyse critical events that mark and generated changes to the implementation process, in order to gain a better understanding of how and why implementation has changed (Figueiro et al., 2017). During data collection we therefore focussed on changes in the implementation process over time.

The CEC is an analytical tool that is originally applied in two steps. First, critical events in the programme's evolution are identified. Second, the identified events are analysed using the following seven categories of the CEC (19,22): (1) actors (human and non-human) and their interests; (2) controversies: conditions that destabilize routines and relations among actors; (3) interactions between actors; (4) actions performed by actors; (5) mediation: the transformation of a situation; (5) consequences for implementation; (6) materialisation of the event (e.g., in a document); and (7) location and time. We applied the CEC as part of our analysis, though we adapted the application of the tool and added extra steps. These adaptations enabled us to compare events and processes across communities.

Participating JOGG communities

At the local level, JOGG is initiated by municipal government and then implemented in (part of) the municipality. In the remainder of the paper, a 'community' refers to an individual municipality in the Netherlands that implements the JOGG approach. To explore the implementation of the JOGG approach over the long term, we first generated a list of communities that had implemented the JOGG approach for at least five years ($n = 89$). We then purposively sampled for maximum variation

to gain insights into the implementation in different contexts. We randomly selected communities that were diverse on the following three sample characteristics: population size, the implementing organisation, and working hours per week appointed for JOGG coordination. These characteristics have previously been identified as relevant indicators for variation in implementation between communities (23,24). The national JOGG organisation provides municipalities with the advice to appoint a coordinator for at least 16 hours per week at a public organisation. Since municipalities themselves can choose for how many hours per week the coordinator is appointed and at which organisation this coordinator will be employed, the implementing organisations and working hours per week vary largely between communities.

We first stratified communities according to working hours appointed for JOGG coordination per week (1' < 12 hours, 2' 13–23 hours, 3' > 24 hours) and implementing organisation. We employed the stratified random sampling technique to select communities from each unique combination of these characteristics. We aimed to include approximately 10 communities to allow for sufficient variation: at least one community from all existing combinations of working hours/implementing organisation. We additionally checked selected communities for variation in population size.

Six JOGG communities declined participation because of staff turnover ($n = 3$), lack of time ($n = 2$) or without providing a reason ($n = 1$). Each time a coordinator declined, we randomly selected a new community that had similar characteristics to the community that had declined. Once we included nine participating communities, no new communities were invited because the participating communities were sufficiently diverse in terms of sample characteristics (see Table 3.1).

Table 3.1 characteristics of participating JOGG communities

Case	Population size of the municipality*	JOGG start year	Implementing organisation	Hours per week appointed for JOGG coordination	No. of participants interviewed
1	Small	2010	Municipal government	12	4
2	Small	2011	Social welfare organisation	0	4
3	Small	2015	Sport service organisation	0	7
4	Small	2016	Public Health service	24	5
5	Medium	2012	Public Health service	13	4
6	Medium	2012	Sport service organisation	20	8
7	Medium	2012	Social welfare organisation	32	4
8	Large	2012	Sport service organisation	>36	2
9	Large	2014	Municipal government	28	3

*Small (<50,000 residents), medium (50,000–100,000 residents), large (100,000–170,000 residents)

Data collection

In accordance with methodological guidelines for applying the CEC, we collected data from different sources (19,22,25): documents and interviews.

Documents

In each community, we asked the coordination team to collect documents on the implementation process, including programme plans, logbooks, meeting notes, policy plans on JOGG, and communication materials (e.g., press releases and newsletters). We extracted information regarding resources, staff, the policy context, programme theory, objectives, implementation strategy, planned activities and implemented activities from the collected documents.

In preparation for the interviews, IH thoroughly read the information extracted from the documents and identified changes and milestones in the implementation process. Changes and milestones that were mentioned in multiple documents or explicitly described as important were included in a draft timeline of the implementation process for each community. Observations and questions about the implementation process that arose while drafting the timeline were included in the interview protocol.

Online interviews

In each community, the local coordination team – which consists of a programme coordinator at the implementing organisation and a policy officer – participated in an interview. We conducted additional interviews with other individuals who, according to the documentation, had been closely involved in the implementation of the JOGG approach. We additionally asked the coordination team for suggestions about other individuals who were closely involved in the implementation of the JOGG-approach. How many other individuals were actually involved in the implementation varied largely between communities. Additional interview participants included: previous JOGG coordinators and policy officers, other local JOGG staff in the implementing organisation (e.g. sport coach who managed a specific project), and partner organisations who were involved in a JOGG steering group (one school principle and professionals from Public Health service and Sport service). Lastly, we interviewed the community advisor from the national JOGG organisation, who in most cases had been advising the community for several years (except for community 8, due to staff turnover at the national JOGG organisation). Table 3.1 depicts the number of participants per community. In total, we held 24 interviews with 41 participants (one to four participants per interview).

As a basis for the interviews with the local coordination team we used the draft of the timeline we had created based on the document analyses. We shared the timeline through the online whiteboard application Miro (26). The timeline assisted interviewees in placing developments and events in chronological order (25,27) as well as facilitated discussions of these events (28). In the first part of the interview, we focused on the implementation process over the years as well as changes in said process and key events related to these changes, including turning points and prominent successes/failures. New key events were added to the timeline, while events that were not key – according to participants – were removed. In the second part of the interview, each event on the timeline was discussed in depth. In additional interviews, we focused on specific events on the timeline that the participant(s) had been involved in. The topic lists can be found in supplementary file 3.1.

All interviews were conducted online by one member of the research team (IH), duration varied between 29 and 120 minutes. Interviews were conducted between August 2021 and October 2022, spanning maximum four months for each community. In community 8, we conducted a follow-up interview in February 2023 to discuss significant developments that had transpired since the first interview. Written informed consent was obtained from all the participants in this study before starting the interviews. The study was carried out in accordance with relevant ethical guidelines.

Analyses

First, analyses focussed on how programme implementation changed over time in each community, in order to later be able to compare the implementation processes across communities. Two researchers (IH and MH) independently reviewed the documents and interview transcripts to identify phases of change in the implementation process. Identified phases were discussed and compared to develop the definitive description of the implementation process in each community and identify common phases across communities. The six common phases that we identified served as the foundation for structuring further analysis and results description.

Second, for each common phase of change, IH and MH coded the interview transcripts and documents in each community according to the forementioned seven CEC categories. These analyses helped us to understand the interactions between the programme and context that led to changes in implementation and thereby to identify events that were critical in shaping the overall implementation process. We defined a critical event as an event or combination of conditions that generated consequences and led to the reconfiguration of the programme (19,22), regarding the phase of change as the reconfiguration of the programme. Therefore, events listed on the timeline at the end of the interview were not automatically designated as 'critical events'. Our approach deviates from the CEC approach in previous studies (19,22), which first identify critical events and then analyses these according to the CEC. An example of how the CEC was applied in this step of the analysis can be found in supplementary file 3.2.

Third, the coded implementation phases in each community and critical events in these phases were compared to identify and explain commonalities and differences between communities (29). We did this per common phase that we had identified in the first part of the analyses. For example, one common phase that we identified was 'upscaling', which happened in 5 communities. We compared upscaling for these five communities. This provided insights into the critical events that appeared relevant across contexts for each common phase of change. Because we consider the term 'critical events' to be too context specific for describing the more abstract events that are relevant across contexts, we talk about 'key events' in the remainder of the paper. We define key events as: events and interactive processes, that had a similar role in different contexts.

RESULTS

We identified the following six common phases of change in the implementation of the JOGG approach in the nine communities: (1) preparation; (2) initiation of JOGG; (3) upscaling; (4) integration with other policy initiatives; (5) resource mobilisation; and (6) adaptation of the implementation strategy. An overview of the implementation process and phases of change in each community can be found in supplementary file 3.3. This overview shows that not all communities went through all of the six phases and that in each community these phases occurred in a different order, had different timelines and slightly differed from each other.

In each common phase of change in the implementation process we identified several key events in communities that interacted to create this change. The remainder of the results section presents the different key events identified for each of the common phases and highlights differences and similarities between communities. Often, a combination of events and programme/context elements, rather than a single event, shaped the implementation process. Table 3.2 presents a summary of the key events.

Preparation

The first phase in the implementation process was the preparation phase prior to initiating the JOGG approach. All communities were driven to take action on overweight prevention by two key events: (1) attention to the prevention of overweight was increasing in national and local health policy; and (2) local policy officers were signalling a high overweight prevalence in the community. Communities all considered JOGG an evidence-based, and therefore suitable approach, for childhood overweight prevention.

The motivation for initiating JOGG varied between communities and appeared key for the implementation process in the first years. For some communities, the main reason for initiating JOGG was to accomplish a reduction in the prevalence of overweight in a cost-efficient manner. In some of these communities, initiating JOGG was a way for political stakeholders to show that they acted to prevent overweight.

JOGG communities that expected a cost-efficient reduction of overweight, experienced several difficulties during the initial years of implementation. Local governments did not provide resources, because they expected local stakeholders to contribute. However, these stakeholders were not yet involved at the initiation of JOGG. Coordinators experienced limited support from these local stakeholders:

'At some point I was bombarded to be the JOGG coordinator for this community. And I was not yet familiar with what that would comprise exactly. In the chosen neighbourhood, nobody knew anything about it. So that was some starting phase... It was just a top-down decision to become a JOGG community and what neighbourhood it would start in [...]. It required a lot of energy to elicit people's enthusiasm.' – Coordination team, C6

Table 3.2 Summary of key events in each implementation phase of the Healthy Youth, Healthy Future (JOGG) approach

Preparation	- Increasing importance of prevention in national and local health policy - Indication of high prevalence of overweight and/or low levels of physical activity in the community - Implementation of another health promotion programme before JOGG was initiated (Political) motivation for implementing JOGG: - To (cost efficiently) accomplish a decrease in the prevalence of overweight - To display action for overweight prevention - To follow-up/strengthen an existing programme
Initiation of JOGG	- The JOGG policy officer framed the JOGG approach in local policy as - a programme with activities and campaigns to create awareness of the issue - a way to shape intersectoral collaboration - Framing was influenced by vision of the JOGG policy officer on JOGG and health promotion - The policy sector from which JOGG was initiated
Upscaling	- Upscaling was planned in the initial local JOGG plan - Lobbying of the JOGG policy officer for upscaling - Timing: opportunity for change (e.g., a new policy term) - Political support for JOGG/upscaling was facilitated by - a growing urgency for prevention in society and national policy - the communication of positive results
Resource mobilisation	- Upscaling caused a need for additional resources - Staff turnover: a new coordinator noticed and discussed the necessity for increasing resources - A policy officer lobbied for additional resources - Lobby was successful in facilitative context: - Political support and available budget - A good relationship and trust within the coordination team
Integration with other policy initiatives	- Developments in national and local policy: new health/sport programmes - Depends on the policy sector from which JOGG was implemented - Overlap between different health programmes in the community - Timing: an opportunity for integration in the (policy) process
Adaptation of the implementation strategy	- Staff turnover: different vision and skills in the coordination team - Experiences from the coordination team during implementation: - Learning about what does or does not work - With different implementation strategies - Events that triggered new experiences (e.g., COVID-19) - New opportunities or challenges for implementation caused by - Upscaling - Policy developments (e.g., increased political attention to health equity) - Changing needs of partners

By contrast, other communities had an extensive preparation phase which motivated the initiation of JOGG. Most of these communities had a health or sport programme in place in the years before they initiated the JOGG approach. JOGG was implemented as a follow-up for these existing programmes. The main reason for these communities to initiate JOGG was the theoretical model, support and tools that JOGG offered, which could help them further shape their efforts.

Notably, communities that initiated JOGG as a follow up on previous efforts seemed to have had a head start in the implementation of JOGG. They were able to build upon existing programmes and experienced strong (political) support for its implementation. In addition, their network was already accustomed to intersectoral collaboration, which was beneficial for the implementation:

'They were actually already working on that [integrative thinking]. I think that this is a real difference with other communities that started the JOGG approach, where that way of thinking, that way of collaborating, that is something that must still become routine in the community.'

– National advisor, C5

Initiation of JOGG

During the initiation phase, two events appeared key for further implementation, the first of which was framing. When initiating JOGG, the involved policy officer framed it within local policy according to their own vision of health promotion. The JOGG approach was either framed as (1) a programme with activities and campaigns for creating awareness of childhood overweight/healthy lifestyle, or (2) a way to shape intersectoral collaboration. The focus of the implementation over the years (on activities or on intersectoral collaboration) was strongly impacted by how JOGG was framed in local policy and the local JOGG plan.

Second, the sector from which JOGG was initiated affected the further implementation process, specifically the collaborations and activities implemented over the years. In communities where the JOGG approach was implemented from health policy, the JOGG network and activities were centred around health (care). By contrast, in communities where JOGG was implemented from the sport sector, JOGG was more focussed on physical activity.

Upscaling

In most communities the JOGG approach was scaled up after a few years. Often, in their initial JOGG implementation plan, communities had already stated that the JOGG approach would start in one neighbourhood and then later be scaled up to other neighbourhoods. In communities where this was not the case, the coordination team lobbied for upscaling. This lobbying was facilitated by increasing political support for JOGG, which resulted from the increased attention to health promotion in society as well as the efforts of the local coordination team in communicating positive results. The idea was that each child should be able to benefit from JOGG:

'I remember that in the three JOGG neighbourhoods, overweight decreased, and that was the reason for scaling up. And also because people, well, administrators, did not solely want to

focus on deprived neighbourhoods. [...] Overweight was a problem in the whole community, especially among youth. So, I think politically they did not want an exception for certain neighbourhoods, they just wanted to focus on the whole community' – Coordination team, C7

Notably, the timing of formal upscaling depended on opportunities for change, such as at the start of a new policy period or with the extension of the contract with the national JOGG organisation.

Resource mobilisation

Upscaling was often followed by the mobilisation of additional resources and was used to lobby for more budget. One interviewee stated: *'So I think that it was really politically framed so to say. We scale up to the whole city, so we just need extra hours for that'* (coordination team, C8). In several communities, the mobilisation of additional resources was set in motion by staff turnover, since the new JOGG coordinator noticed and then discussed that there were insufficient resources for performing the tasks they were hired to do.

Several elements in the context appeared key for mobilising additional resources. A good relationship and trust between the local coordinator and local policy officer was required, because the policy officer was the one who could lobby for resources with the local government. In addition, political support and availability of resources for prevention in local government were a prerequisite for being able to gain additional resources. In two communities, a bad relationship between the policy maker and coordinator and decreased political support for JOGG after political turnover resulted in loss of resources.

The availability of more financial – and especially human – resources was viewed as essential for further implementation:

'For me, that was a real turning point. [...] that is when you really get to something. You can become more visible and get real results. Before that, I felt that I did not have enough hours to really achieve something. You have to play chess on so many boards. It just did not work' – Coordination team, C8

Integration with other policy initiatives

In multiple communities, new (national) policy initiatives in the sport and health sector appeared a key event in the implementation of the JOGG approach, because these initiatives were connected to or integrated with JOGG. Policy developments in the sector from which JOGG was implemented appeared to be most influential.

Connecting to national policy initiatives

An important national policy initiative for the JOGG approach was the introduction of community sport coaches. Specifically, national government provided municipalities with financial support to employ a community sport coach. These sport coaches connected different sectors (e.g. schools) with sport providers and motivated community members to participate in sports (30). Community

sport coaches strengthened the JOGG approach in various ways. In several communities, they became strongly involved in the implementation of projects and activities, which allowed the JOGG coordinators to shift their focus to building and coordinating the network. In other communities, the coaches became an important link to children:

'Community sports coaches provided her [the coordinator] with extra ways to connect to schools and manage things. For example, the kids run. In one year, 30 children participated, and in the next year, 1200 children. And that was just because we had asked the community sports coaches to go and train for it at their school and participate.' – stakeholder, C6

The relation with the sport policy sector was key for if and how community sport coaches and JOGG in the community were connected. A strong connection between JOGG and the community sport coaches was established in communities where a strong collaborative or personal relationship existed with sport policy, or where JOGG was implemented from the sport sector. In other communities, it was difficult to make a connection:

'We [health policy officers] were not allowed to interfere in sports policy. At that moment, we did not have a strong colleague there. The sport service organisation had a certain position. It was partly financed by us, but they also had their own duties [from sport policy]. And when we wanted to add something to those duties, they were like "Who are you?" And JOGG did not have a positive image at that time, there was some negativity in the media and they had picked up on that.' – Coordination team, C5

Integration with other local (health) programmes

Some communities fully integrated the JOGG approach with another local programme for health promotion. A key event for this integration was the increasing overlap between different health programmes implemented in the community, which led to double work and confusion regarding the different programmes among external organisations. A coordination team explained how this led them to argue that it would be more efficient to integrate different programmes:

P1: 'At some point we [different programme coordinators] discovered that a large overlap existed between our tasks, and also between collaboration partners, and at some point we had so many labels...'

P2: 'Also from our municipality's point of view, a large overlap appeared to exist between the different tasks that we had given the sport service organisation. So we thought maybe we should make that a joint task.'

P1: 'So that is when we started looking at our ambitions and goals and how we could merge those into one big programme.' –Coordination team, C3

Similar to upscaling, the official integration of JOGG was often linked to an opportunity for change, such as at the start of a new policy period or at the start of a new programme with similar goals.

Integration always had diminishing consequences for the implementation of the JOGG approach as such. Although still inspired by JOGG, no specific JOGG programme plans were made after integration. The JOGG name was replaced with a more generic name, such as 'healthy lifestyle' and the focus of the programme broadened (e.g., additional age groups and health themes). Interviewees experienced positive consequences of integration; by embracing broader aims it became easier for the coordination team to involve new partners and gain resources, which increased the reach, scope and intensity of the programme.

Adaptation of the implementation strategy

All communities adapted their implementation strategy at some point. In many communities for example, the focus on developing and implementing activities was replaced with a focus on creating ownership for action among community stakeholders.

Adaptations to the implementation strategy were driven by several key events. The first was staff turnover in the coordination team. New staff inherently changed the implementation strategy, especially when they had different skills; for example, in several communities a new coordinator was installed who was skilled at networking and motivating partners, which became a strong focus during implementation. In another community, a new policy officer brought the opportunity to change various aspects at the policy level:

'You need the right people at the right place—the right policy officer. Before, I worked with [name] and we had good contact; however, she did not dare to address this issue with the alderman. Then [name] came in her place, and I already knew her from another function in the municipality. And on day one I was at her desk, like listen, I have a good idea and I think you can score with that.' – Coordination team, C2

Second, upscaling to other neighbourhoods caused the coordinator to adopt a different strategy to deal with the growth in the network:

'I had 18 hours a week. Well, I can tell you, that this is not enough for the whole city. [...] So I was really using my hours as networking hours, to look at who I would need in my network and which partners to involve.' – Coordination team, C8

A third key event for adaptations to the implementation strategy was an event that elicited a positive experience towards another strategy. Some communities participated in a national health policy pilot in which they received resources for supporting bottom-up initiatives. Due to positive experiences with this pilot they wanted to pursue this approach. Another example is COVID-19, which resulted in positive experiences with intersectoral collaboration.

Furthermore, national and local policy developments were a key event for adaptations to the implementation strategy. For example, reforms in the social sector led the coordination teams to rethink the position of the JOGG approach within the community. New policy plans then formed an opportunity to frame the JOGG approach in a new way and to make major changes to the implementation.

In addition, coordination teams continuously examined how they could adapt their strategy to fit the need of partners:

'Years ago, we started with a steering group, which eventually became a stakeholder group, which has now been integrated into the prevention meeting. So that is how, over the past years, we have continuously tried to go along with developments in the community. To look at what partners are doing and look for the most logical place to exchange ideas with them. To not tightly hold on to our plan from 2016 for how we would organise our network'. – Coordination team, C3

Lastly, JOGG-teams adapted how they implemented JOGG according to their experience of what works and what does not.

Increased focus on health equity

Between 2019 and 2022 multiple communities made a similar adaptation to their implementation strategy. Specifically, the target group changed from 'all children' to 'the most vulnerable youth' to focus on improving health equity. A key event for this adaptation was health equity becoming a more important theme in both national health policy and practice:

'Over the years you start looking for more depth in your JOGG approach. In the beginning, you try to reach as many schools as possible and, with your activities, as many children as possible. And at some point, you get together and think, "A lot is happening, and we reach a lot of people, but do we reach the people that we really want to reach?"' – Coordination team, C6

While attention for health equity had increased prior to COVID-19, it did not immediately lead to an extra focus on vulnerable groups. An event was required to trigger such change. For some communities, this event was their participation in a project(s) on health equity. For example, one community participated in a pilot programme of the Youth Breakfast Foundation, in which the health and social sectors collaborated to provide a healthy breakfast for youth growing up in poverty. The positive experiences and new collaborations that resulted from that project stimulated further action. For several communities, COVID-19 was the event that created the urgency to focus on health equity, as health inequity became more prominent during this period.

DISCUSSION

The nine communities included in the present study had undergone several common implementation phases during the 5-10 years they had implemented JOGG: preparation, initiation, upscaling, resource mobilisation, integratio

n with other policy initiatives and adaptation of the implementation strategy. The timeline and exact content of these phases differed between communities, and not every community went through all these phases. We identified several key events that appeared to have shaped each specific implementation phase and influenced the further implementation process. The form of these key events varied slightly across contexts, though their function in shaping the implementation process was similar.

In the preparation phase, communities that initiated JOGG with the motivation to follow up existing efforts appeared to have had a head start in implementation compared with communities that implemented JOGG solely as a cost-efficient manner to decrease overweight. During the initiation phase, how JOGG was framed in local policy and the policy sector from which it was initiated (e.g., health or sport) impacted the focus of the JOGG approach. Key events that played a role in later phases included developments in national and local policy (e.g., new programmes and attention to a theme), the experiences, skills and actions of the coordination team, changing political support, and opportunities for change in the policy process. In addition, in accordance with the actor network theory (19,25), we found that adaptations to the implementation strategy often followed a disruption of the normal state of affairs. For example, integration with another policy programme, COVID-19, upscaling and staff turnover all destabilised routines and triggered changes to the implementation strategy. Moreover, how these disruptions changed the implementation strategy was largely dependent on the actions of the coordination team.

Some of the identified key events match the facilitators and barriers to implementation identified in previous JOGG implementation studies (7,31), which focussed on implementation fidelity to the local action plan. Our findings provide a more dynamic perspective on these facilitators and barriers. To illustrate, the previous studies identified the availability of (financial) resources and political support as crucial facilitators for implementation. Our findings suggest that these resources and political support change over time in response to actions of the coordination team, upscaling, opportunities for change in the policy process and national policy attention.

Furthermore, several key events, have similarities with results of previous international studies on obesity prevention policy (32), including the role of timing (opportunities for change), framing and the key role of the coordinators and their personal vision and skills. Such interactions with the policy context appeared essential for available resources, adopted implementation strategies, scaling up and sustainability of the programme. These have not been identified in previous studies on the implementation of community-based health promotion programmes (33). This finding highlights

the importance of taking into account processes and theories of policy decision making (32,34), in studying the implementation of community-based health promotion.

In this study we focussed on higher level changes in the implementation process, such the strategies of the implementation team, shifting priorities and changes in available resources. These provided insight into how a community-based programme was successfully scaled up, integrated into local policy and sustained. In the current study, we did not examine implementation outputs, such as network growth or developed actions and interventions. Future studies could examine the interactive process of attaining such implementation outputs, to gain deeper insights into successful implementation.

Implications for practice

This study's findings have several implications for optimising the implementation process of the JOGG approach and other community-based programmes. First, our findings demonstrate that the coordination team is an essential actor throughout the implementation process. Initially the policy officer in the team influences how the programme is framed in local policy. During implementation, the coordination team plays a large role in maintaining political support and adapting the implementation strategy as required. Turnover in the coordination team often preceded a new phase in the implementation process. This implies that the coordination team must be appointed with care as well as supported in the adaptive implementation process. In addition, it may be useful to employ members with specific skills in the coordination team when a new implementation strategy is required.

Second, we found that formal changes to implementation only occurred when opportunities for change, such as a new policy period, were leveraged to push for change. Therefore, the coordination team having the skills and knowledge to recognise opportunities for change and then being able to use these opportunities to strengthen the programme seems crucial. Informing coordination teams about upcoming national opportunities for change could help them to recognise and act on opportunities in time.

Third, the adaptation of the implementation strategy appeared to be an important phase. This finding accords with the idea that a community-based programme needs to continuously adapt to changes in the context and through learning from successes and failures (9,35). Notably, adaptations to the JOGG approach were often driven by informal experiences of the coordination team, rather than by formal evaluation practices. The implementation of community-based programmes could be enhanced by ensuring more systematic monitoring and evaluation of the factors that influence implementation, the changing context, and the emerging outcomes (9).

Lastly, the policy context and national political and policy developments appeared to greatly influence the implementation at the local level. Therefore, it seems vital to follow relevant developments and to use them to strengthen implementation. Coordination teams can be supported in dealing with new national policy programmes (e.g., whether and how to integrate

them with JOGG) and in using policy attention to a certain theme (e.g., health equity) to strengthen the implementation with new resources and collaborations. Our findings also imply that it is important to carefully consider the policy sector where the programme is implemented, as policy developments in this sector appear to be the most influential.

Strengths and limitations

A strength of this study is the application of the CEC, which helped us to consider the interconnectedness between programme and context, to go beyond studying isolated facilitators and barriers to understand how they influence implementation in the context. By doing this we identified potential leverage points that can inform future communities in implementing community-based programmes.

Another strength of this study was the long time period over which we examined the implementation process (i.e., 5-10 years). Considerable time and effort were required to involve relevant stakeholders, gain political support, scale up, mobilise resources and sustain the JOGG approach. This finding resonates with the idea that community capacity-building requires a long timeframe (3,12,20) and highlights the need to follow the implementation process over a long period to be able to identify events that lead to success or failure (12).

Our study also has limitations. A 'critical event' is an abstract concept that could be interpreted and used in different ways, which complicated the identification and analysis of critical events. Several trials and discussions within the project team were required to reach a consensus on an application of the CEC that would fit our study, which differed slightly from previous studies (19,22). Instead of identifying critical events and coding them according to the CEC, we chose to first distinguish larger implementation phases and subsequently analyse them according to the CEC. This approach helped us to gain insights into the multiple interactive events that shaped implementation phases and compare key events across different communities.

Notably, the retrospective design produced several threats to validity (29). Selection bias may have played a role. Communities that declined participation may have experienced more difficulties in implementing the JOGG approach than the participating communities. In addition, in some communities we found limited documentation about a phase, which could indicate difficulties in the implementation process that we were not able to capture. Recall bias may also have played a role, especially when interviewees were discussing events from several years ago. However, by combining data sources and triangulating the data from interviews with different stakeholders and documents, we attempted to mitigate this bias.

CONCLUSION

Our findings highlight the relevance of considering the interaction of programme and context over time when studying the implementation of community-based programmes. By identifying

the key events that were essential in shaping the implementation process, we can guide future implementation of JOGG in other communities. Taking this approach in evaluation could benefit future evaluations of community-based programmes. Key events identified in the implementation process of the JOGG approach may also guide the implementation process of other community-based programmes.

Acknowledgements

We would like to thank Jennifer Campmans for her contribution to data collection and transcription during her internship. In addition, we would like to thank all coordination teams that participated in the study.

Abbreviations

JOGG – Healthy Youth, Healthy Future

CEC - Critical Event Card

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Chapter 4

A qualitative exploration of the coordinator's role in an intersectoral childhood overweight prevention programme in the Netherlands: 'a lot is expected from one person'

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Published in:

BMC Health Services Research. 2024;
<https://doi.org/10.1186/s12913-024-12019-3>

ABSTRACT

Background: Intersectoral collaboration is crucial for successful community health promotion, and its success relies heavily on strong coordination. However, the training and support needs of coordinators in the community can vary significantly due to the diverse organizational contexts in which they operate. To date, there is limited insight into how coordinators tasked with building intersectoral collaboration in a community apply their role given their specific organisational context. A more detailed understanding of this process will provide valuable guidance for training and supporting local coordinators. In the current study we focussed on coordinators involved in building intersectoral collaboration within the 'Healthy Youth, Healthy Future' (JOGG) approach in the Netherlands. The organisational contexts in which these local coordinators operate vary considerably. The aim of this study was to explore how local coordinators of the JOGG approach apply their role in building intersectoral collaboration and the competencies they require, taking into account their organisational context.

Methods: We conducted interviews with twelve local JOGG coordinators and two focus groups with eight community advisors from the national JOGG organisation. Data was analysed both inductively and deductively.

Results: JOGG coordinators appeared to take on seven different roles over time: implementer, project manager, networker, matchmaker, linchpin, politician and programme manager. These roles required different competencies and varied according to the organisational context, including: available resources, the position of the employing organisation in existing local stakeholder networks, the coordinators' responsibilities in their employing organisation and professional background. In addition, the coordinators role depended on the implementation phase of the JOGG approach. During the first phase, roles at the operational level were more prominent, since they were important for engaging stakeholders and facilitating collaboration. In later phases, coordinators took on roles at a tactical and strategic level in order to mobilise their network.

Conclusions: This study highlights the diversity in how JOGG coordinators apply their role. Our findings highlight the importance of careful consideration of the organisation where coordinators are employed, as this influences their possibilities. In addition, our study provides directions for recruiting coordinators for an intersectoral health promotion approach and supporting them, taking into account the phase of the approach and organisational context.

BACKGROUND

Given the fact that community health is driven by a wide range of interacting determinants within different sectors of society(1), community health promotion requires collective intersectoral action(2). Intersectoral health promotion can be defined as *"a recognised relationship between (parts of) different sectors of society which has been formed to take action on an issue to achieve health outcomes or intermediate health outcomes in a way which is more effective, efficient or sustainable than might be achieved by the health sector acting alone"* (3). The assumption is that better results can be achieved with collaborative action, then when working in isolation(4).

Although intersectoral collaboration for health promotion is promising(2,5), it has been found to be challenging. Because sectors have diverging interests(6) and often work in a pre-existing collaboration structures and cultures(7,8), a wide range of barriers can hamper intersectoral collaboration. Reported barriers include competing priorities, budgets and procedures (9), low quality of communication(7,9) and lack of trust(10).

To achieve successful intersectoral health promotion, coordination or leadership of the intersectoral collaboration is deemed essential(7,11–15). Coordinators engage potential partners(16) and can help overcome the barriers of intersectoral collaboration by bridging the gap between different sectors that are involved(11,12,17,18).

Previous studies have demonstrated that a coordinator's success in building intersectoral collaboration is significantly influenced by the organisational context in which they operate (7,19). Success depends on the organisation's existing relationships and social capital in the community. More importantly, sufficient organisational capacity is essential for successfully coordinating intersectoral collaboration (19,20), including organisational level resources and support structures as well as individual level coordinators' competencies (skills, knowledge and capabilities). Previous research shows that competencies associated with the success of coordinating intersectoral collaborations for health promotion include being inspiring, innovative and committed to their vision(6,13,21). Furthermore, studies suggest that in order to facilitate collaboration between organisations from different sectors, coordinators need soft skills (e.g. communicative skills)(7,21,22) and specific integrative competencies(8,18). These integrative competencies involve understanding an organisations' identity, interests and collaboration structures, and how these can be leveraged to foster intersectoral collaboration.

With the increasing popularity of intersectoral collaboration for community health promotion (20,23), many different local organisations and individuals are tasked with building intersectoral collaborations(24). For example, in the Netherlands a widely implemented intersectoral health promotion programme is the Healthy Youth, Healthy Future (JOGG) approach(25,26). In this programme, local coordinators are tasked to build intersectoral collaboration within a community. The national JOGG organisation supports these coordinators with advice, training and tools. The organisational context in which the local JOGG coordinators work varies widely between

communities. Depending on the community, coordinators have different amounts of resources to their availability and can be employed by various public organisations. In addition, coordinators have different backgrounds, often not specifically related to the task of coordinating intersectoral health promotion. Examples are health policy maker, health care practitioner or sport coach.

To ensure success in building intersectoral collaboration, it is essential to provide training and support to local coordinators(27,28). Given the diverse organisational contexts in which coordinators operate, training and support needs of coordinators may vary widely. However, much remains unknown about these variations. While it is well established that the organisational context significantly influences the success of building intersectoral collaborations (7), few studies comprehensively have assessed this process. Existing literature on building successful intersectoral collaboration (7,29) predominantly focusses on the process of building the collaboration itself, rather than the organisational context in which this process is embedded. Additionally, few studies have focussed on the implementation of intersectoral collaboration at the local level (24,28). Consequently, there is limited insight into how local coordinators tasked with building intersectoral collaboration apply their role within their specific organisational context(7) A more detailed understanding of this process can provide valuable guidance for training and supporting local coordinators to effectively build intersectoral collaborations.

The aim of this study was to explore how coordinators of the JOGG approach apply their role in building intersectoral collaboration and the competencies they require, taking into account their organisational context. Insights from this study can be useful for recruiting, training and supporting JOGG coordinators and may also provide direction for coordinating other local intersectoral health collaborations.

METHODS

Study setting: the JOGG approach

JOGG aims at preventing childhood overweight by creating a health promoting (social and physical) environment (25,26). The core of the JOGG approach consists of building intersectoral collaboration between relevant community stakeholders in settings where children live, play and learn (e.g. schools, sports clubs and supermarkets), on different levels (e.g. local government, health practitioners, private organisations).

Design

Since we aimed to gain a more detailed understanding of how coordinators applied their role we conducted a qualitative study. The study consisted of two phases. First, we conducted interviews with local JOGG coordinators to gain insight into how they applied their role and the competencies required. Second, we validated and refined findings of the interviews with advisors from the national JOGG organisation. These advisors are responsible for supporting local coordinators in the implementation process. Given their overview perspective, we expected that advisors could

offer additional insights on the coordinators experiences. We followed the consolidated criteria for reporting qualitative research (COREQ) guidelines (30), which can be found in Supplementary file 4.1.

Recruitment and sample

To be able to study a diverse group of JOGG coordinators and contexts, we purposively sampled for maximum variation (31). Throughout this process we considered relevant characteristics of the organisational context, including: the experience of the coordinator (in years), their employer and working hours per week appointed for the JOGG approach. In addition, we took into account population size and start year (duration of JOGG implementation) because these were hypothesized by the national JOGG organisation to be significant in explaining differences among coordinators.

In total, 174 communities implemented the JOGG approach at the time of the study. In each community one coordinator is responsible for local implementation. To select interview participants, we asked the national JOGG organisation to compile a shortlist of 20 to 25 coordinators who had served in this role for at least one year and varied in the characteristics described above.

We initially aimed to include 12 to 16 local coordinators, to ensure sufficient variation in characteristics. We e-mailed sixteen coordinators an invitation to participate in the study. Twelve agreed to participate, one coordinator did not respond after several reminders and three participants declined participation due to lack of time ($n=1$), a job change ($n=1$) or without providing a reason ($n=1$). As no new insights emerged in the last of the 12 interviews, indicating data saturation, no new invitations were sent out. An overview of participant characteristics can be found in Table 4.1. Participating coordinators ranged in age from 20 to 50 years old, with ten female participants and two male participants. In the second phase of the study, our objective was to validate and refine findings of the interviews by incorporating additional insights from national JOGG advisors. We recruited these advisors through an open call to the team of eleven national JOGG advisors. Seven JOGG advisors and one team member responsible for recruiting and advising new JOGG communities (including advice about employing a coordinator), participated in two focus groups of five and three participants.

Table 4.1 Characteristics of interview participants

ID	Start year of JOGG approach in the community	Population size JOGG community*	Years of experience as a JOGG coordinator	Working hours appointed for coordination (per week)	Employer**
1	2013	Large	5	32	Municipal government
2	2014	Small	2	30	Sport service organisation
3	2014	Small	1	8	Social welfare organisation
4	2014	Medium	3	30	Sport service organisation
5	2014	Medium	6	16	Municipal government
6	2016	Large	1	22	Sport service organisation
7	2016	Medium	4	24	Social welfare organisation
8	2017	Medium	1	16	Sport service organisation
9	2017	Small	2	18	Municipal government
10	2017	Medium	1	14	Sport service organisation
11	2018	Small	2	16	Public Health Service
12	2019	Small	1	16	Municipal government

*Small (<50.000 residents), medium (50.000-100.000 residents), large (>100.000 residents)

** Municipal government or public organisations

Data collection

Phase 1: interviews with JOGG coordinators

We developed a semi-structured interview protocol (Supplementary file 4.2), which consecutively focussed on (1) how coordinators implemented the JOGG approach (2) how coordinators experienced and applied their own role in the JOGG approach and (3) the competencies that the coordinators required to successfully fulfil their role. The interview protocol facilitated exploration of the rationale behind the coordinators approach and the barriers and facilitators they encountered. By doing this we aimed to gain a deeper understanding of the organisational context within which coordinators operated.

Two researchers (IH and JS) conducted the interviews with JOGG coordinators in September and October 2020. The first two interviews were conducted by the two researchers together, in order to check and refine the interview protocol and consistency in its use. The other ten interviews were conducted by either IH ($n = 5$) or JS ($n = 5$). All interviews were conducted online via Microsoft Teams. Audio was recorded and transcribed verbatim. Interview duration varied between 60 and 90 minutes.

We obtained informed consent from all participants before starting the interviews. At the start of the interview we emphasized main points from the informed consent, including anonymity in analysing and reporting results.

Phase 2: focus groups with advisors from the national JOGG organisation

The aim of the focus groups with advisors from the national organisation was to validate and refine the themes that had emerged from the interviews with coordinators. The protocol for these focus groups was developed by IH and JH and focussed on 1) discussing themes that emerged from the interviews (interpretation, clarity exhaustiveness), 2) discussing competencies coordinators required. The focus groups were conducted online through Microsoft Teams by IH and JS in June and July 2021. Informed consent was obtained from all participants before starting the focus groups. The focus groups lasted 75 and 88 minutes. Audio recordings were transcribed verbatim.

Analysis

We analysed the data with MAXQDA 2020 software for qualitative data analysis. We conducted thematic analysis to identify key elements in the coordinators' role application and identify and describe differences and similarities in the experiences of coordinators. We followed the approach outlined by Braun and Clarke (32): (1) IH and JS familiarised themselves with the data and discussed potential ideas. (2) JS inductively coded the data and (3) sorted the codes into potential overarching themes and subthemes. (4) IH and JH independently reviewed the potential themes in relation to the coded data extracts and entire dataset. (5) Potential themes were discussed among IH and JH, named and refined. (6) JH finalised the analysis for these refined themes and wrote a description of each theme.

Since the discussions in the focus groups centred around the themes that had emerged from the interviews, we adopted a deductive approach to analyse focus group results. Both IH and JS independently coded the results of the two focus groups, based on the previously emerged themes and then jointly reviewed and discussed results. The results of the focus groups offered a more detailed understanding and description of previously emerged themes. JS finalised the analysis by refining the themes and their description.

RESULTS

The themes that emerged from the analysis represent seven distinct ways the coordinators applied their role, each associated with specific competencies and factors in the organizational context. First, we describe the seven identified roles, followed by a reflection on the required competencies and role of the organizational context.

Seven roles of the JOGG coordinator

Overall, JOGG coordinators perceived their task to coordinate intersectoral collaboration as diverse and complex:

'When purely looking at the JOGG coordinators function you have to be a jack of all trades. You have to communicate to and collaborate with diverse stakeholders, which is quite complex. I think that it differs from person to person, what someone is good at and what someone actually does. A lot is expected from one person.' – JOGG coordinator 8

We identified seven different roles of JOGG coordinators in the intersectoral collaboration. The seven roles notably ranged from an operational level to a more tactical and strategic level. Table 2 summarises the identified roles and competencies.

Table 2. Summary of the themes: seven coordinator roles and competencies associated with each role

Role	Description	Competencies
<i>Implementer</i> (operational)	• Implements activities and provides practical support • Aims to become familiar in the community	<i>Organising</i> <i>Supervising</i> <i>Intrinsically motivated</i> <i>Enthusiastic</i>
<i>Project manager</i> (operational)	• Manages and facilitates projects in which (potential) partners collaborate • Ensures the collaboration is successful	<i>Planning</i> <i>Organising</i> <i>Decision-making</i> <i>Creative</i> <i>Result oriented</i> <i>Perseverant</i> <i>Entrepreneurial</i>
<i>Networker</i> (operational/tactical)	• Creates and expands the local JOGG network • Is an ambassador for the local JOGG approach • Promotes the JOGG approach and ensures that the JOGG approach is well known within the municipality • Approaches and engages relevant stakeholders • Creates awareness of the goal of the JOGG approach among potential partners • Explores possibilities for collaboration	<i>Communicating on different levels</i> <i>Inspiring</i> <i>Proactive</i> <i>Persuasive</i> <i>Perseverant</i> <i>Intrinsically motivated</i> <i>Enthusiastic</i> <i>Entrepreneurial</i> <i>Sensitivity to needs and interests</i> <i>Patient</i> <i>Confident</i> <i>Familiarity with relevant stakeholders and community structures</i>
<i>Matchmaker</i> (operational/tactical)	• Incidentally connects partners • Matches partners with a specific need to (potential) partners who can meet this need	<i>Flexibility</i> <i>Taking initiative</i> <i>Listening</i> <i>Stimulating collaboration</i> <i>Communicating on different levels</i> <i>Sensitivity to needs and interests</i> <i>Patient</i> <i>Intrinsically motivated</i> <i>Enthusiastic</i> <i>Entrepreneurial</i>

Table 2. Continued

Role	Description	Competencies
<i>Linchpin</i> (tactical)	- Keeps partners in the network engaged - Stimulates and facilitates collaboration in the network - Stimulates ownership among network partners - Maintains an overview of the network and actions from network partners - Monitors progress towards the goals of the approach	<i>A helicopter view</i> <i>Sensitivity to needs and interests</i> <i>Knowledge about effective health policies and interventions</i> <i>Listening</i> <i>Strategic thinking</i> <i>Communicating on different levels</i> <i>Confident</i> <i>Entrepreneurial</i> <i>Intrinsically motivated</i> <i>Patient</i> <i>Familiarity with community structures</i> <i>Collaboration skills</i>
<i>Politician</i> (strategic)	- Follows national and local policy developments and trends - Aligns (municipal and national) policy and practice	<i>Political sensitivity</i> <i>Convincing</i> <i>Confidence</i> <i>Visionary</i> <i>Perseverant</i> <i>Patient</i> <i>Strategic thinking</i> <i>Knowledge of policy processes</i> <i>Communicating on different levels</i> <i>Sensitivity to needs and interests</i>
<i>Programme manager</i> (strategic)	(Strategic) management of the local JOGG approach in reaching a long term goal - Leads a team of professionals in the community - Delegates implementation tasks to the team of professionals - Manages the (project) budget	<i>Leadership and management skills</i> <i>Strategic thinking</i> <i>Knowledge about effective health policies and interventions</i> <i>Entrepreneurial</i>

First of all, four coordinators indicated that they implemented activities, interventions in the community or provided practical support for their implementation (e.g. distributing posters to schools). Two other coordinators implemented activities, but explicitly mentioned only doing this to engage relevant stakeholders or to familiarize with them. In both focus groups JOGG advisors pointed out that the role as 'implementer' was preferably delegated to other professionals.

Other JOGG coordinators acted as project manager for (collaborative) health promotion projects. In the role of project manager, coordinators fostered connections and engagement by gathering (potential) partners in a collaborative project and managing this project, to ensure successful collaboration. A coordinator explained:

'You really need someone who carries the projects, sends the emails, sets meetings and makes notes. You know, at the beginning that is really your role, to facilitate everyone as well as possible. Which eventually leads to creating concrete actions together.' – JOGG coordinator 4

Almost all coordinators indicated that they had a role as networker. In order to engage organisations in the intersectoral collaboration, JOGG coordinators acted as ambassadors for health promotion and actively approached persons or organisations to join and collaborate in the network:

'With some people you just have to be bold enough to just ask for a meeting. And then I tell something about JOGG, and about what we do in this community. And then I try to inspire them, with what we do but also with what their role could be. 9 out of 10 times I get an enthusiastic response' – JOGG coordinator 2

Another role was the matchmaker. In this role, coordinators facilitated connections in the intersectoral network. They actively matched a partner with a specific need, to a partner that could meet this need. For example, matching a school in need of a healthy food supplier with a local supermarket.

'I often ask partners: what can I do for you? Do you have any problems that I can help with? And then I start looking for a solution. I ask around in my network: this partner needs help with this, could you help out? That is how we try to help each other' – JOGG coordinator 4

Coordinators agreed that once a network of engaged partners was formed, their main role was to be the linchpin in the network. As linchpin the coordinators made sure that more could be achieved through collaboration in the network than by each partner individually. In order to assure this, the linchpin tried to keep partners engaged, stimulated ownership, stimulated connections in the network and facilitated collaborative projects.

'I think it is important to keep an overview and boost the collaboration. As long as I keep asking people things like: hey we had this plan, how is that going? Can I help you with anything? Do you want something else or do you have other ideas? That's how I create new energy. Otherwise people forget. Because it is never their core business to think about children's health' – JOGG coordinator 1

Furthermore, coordinators described that they took on the role of politician. In the role of politician, coordinators invested in intersectoral health promotion by following the trends and developments in (national) policy and aligning these with practice. For example, by keeping an overview of available funds that stakeholders can apply for. On the other hand, they identified issues in practice and advocated for these issues in municipal government.

The last role that emerged was the programme manager. JOGG advisors identified this role specifically in larger communities and communities where the JOGG approach had been

implemented for a longer period of time. Programme managers were responsible for strategic development and management of local intersectoral health promotion. They delegated responsibilities and implementation tasks to other professionals in the community (e.g. sport professionals or youth workers).

Need for a diverse set of competencies

JOGG coordinators and advisors described many different competencies they required, which could be associated with roles that they fulfilled (Table 2). For example, for the role of project manager, coordinators described they needed creativity and organisational skills. As networkers, they needed to be inspiring and sensitive to partners needs and interests. Strategic roles required the coordinators to be visionaries strategic thinkers and to have some knowledge of policy processes.

Some competencies were found to be relevant for multiple roles. Overall, participants described a competent JOGG coordinator as an intrinsically motivated, enthusiastic, entrepreneurial, confident, perseverant and patient person. Listening and communicative skills were considered essential to engage stakeholders and keep them engaged:

'I think it works best to talk to people on their level. So when you talk to an alderman you talk to them in a different way about the JOGG approach than when you talk to a child care professional. One is more practical or pragmatic, while when you talk to an alderman or school principal you talk more about integral and structural things. I think it is important that a coordinator can do that.' - JOGG coordinator 6

Organisational context

JOGG coordinators differed in how they perceived their role. Most of the coordinators did not take on all of the seven roles described in the previous sections, but fulfilled a few of these roles. Differences between coordinators could be explained by the way coordinators acted in relation to their organisational context.

Analysis revealed four contextual conditions that influenced which roles the coordinators took within the JOGG approach. First of all, the roles that were taken depended on implementation phase. Roles at the operational level were considered to be the most important in the first phase of the intersectoral collaboration, because these were needed to become familiar in the community and engage potential stakeholders.

'As the coordinator you often act alone in the beginning and you are working on an operational level. You are the one standing at the helm in order to get things done. After that it is important to start connecting all those stakeholders. The operational role is unavoidable, at the beginning you will visit schools and speak to parents.' – advisor national JOGG organisation

After the first phase in which an active network with different stakeholders was formed, the focus gradually shifted to roles on a more tactical and strategic level. In the roles of linchpin and programme manager, the coordinator mobilised the network partners for health promotion. The roles of politician and networker were perceived as important during all phases of the JOGG approach.

Second, the competencies and professional background of the coordinators themselves influenced their roles. For example, one coordinator described:

'My background is in teaching and such. So I have been an implementer in my previous jobs, but I am a little bit above that now. But I notice that sometimes I find it hard to not act at that operational level.' - JOGG coordinator 10

Third, available resources determined which role was taken by the coordinators. In multiple interviews, JOGG coordinators mentioned that they had insufficient hours to fulfil all relevant roles. This led them to take on the role that fitted them best. Consequently, some coordinators focussed only on the operational level. In contrast, others experienced that the limited amount of time forced them to take on roles on a more tactical or strategic level:

'In the beginning I took on every task. I was working sixty hours a week. I could not keep that up... You have to try to coordinate, instead of implement yourself.' – JOGG coordinator 5

Finally, the coordinator's employer appeared relevant. This organisation usually had their own role in the community structure (of health promotion) and existing relations with other stakeholders. This influenced the coordinator's position and opportunities in collaboration with other stakeholders, for example:

'What I notice now is that there are quite some coordinators working for a sport service organisation. By definition you then have a different role. I know how that relationship is. Even if you are a good coordinator, you have a different influence on policy sectors in municipal government. The financial dependency matters.' - advisor national JOGG organisation

Additionally, coordinators often took on roles that fit in with their other job responsibilities. For example, coordinators working at a sport service organisation, an organisation usually responsible for organising neighbourhood sport activities, often acted as an implementer and project manager in their role as JOGG coordinator.

DISCUSSION

Coordinators in the JOGG approach applied their role in building intersectoral collaboration in varying ways. Overall, we identified seven different coordinator roles: implementer, project manager, networker, matchmaker, linchpin, politician and programme manager. The coordinators' role depended on several conditions in the organisational context and roles changed as the intersectoral collaboration within JOGG in a community progressed. At the start of implementing the JOGG approach in a community, coordinators engaged stakeholders, by taking on roles as an implementer, project manager, networker and matchmaker. Once a network of stakeholders was formed, coordinators mobilised this network by taking on roles on a tactical and strategic level, including the roles as linchpin in the network and programme manager.

Previous studies have examined the various skills necessary for successfully coordinating intersectoral collaboration (7,8,13,18,21,22), which are similar to those described by the JOGG coordinators in the current study. Our findings suggest that required competencies change as the collaboration progresses. Therefore, training and support needs may also change. In the initial stage of network formation, coordinators require skills for planning, organising, communicating and creativity. As the collaboration develops, coordinators require more strategic competencies in order to mobilize and sustain the collaboration, similar to integrative competencies described in leadership theories (8,18). These encompass understanding community structures, sensitivity to needs and interests of organisations and political and strategic thinking.

In this study, we identified several conditions in the organisational context that explained differences in how coordinators applied their role in building intersectoral collaboration. This finding is consistent with results of prior research, that demonstrated the importance of adequate organisational capacity (19) and the organisation's position within the community network (6,8,10) for successful intersectoral collaboration. The results of our study provide a more nuanced understanding of how the coordinators operated within their organisational context. We observed that coordinators' priorities and competencies were shaped by their professional background and usual responsibilities within their employing organisation. For example, coordinators whose background was geared towards organising and implementing activities, applied these in their role as coordinator of intersectoral collaboration. Moreover, due to time constraints coordinators prioritized the roles that aligned best with their competencies, rather than taking the role that would be most effective.

Furthermore, our findings suggest that key elements of the organisational context (19) are closely intertwined. Available resources, staff responsibilities and competencies were inherently related to the position and role of the employing organisation in the community network. For example, several coordinators were employed at a sport service organisation. The primary objective of this organisation, i.e. stimulating sport participation in the community and organising sport activities, demands vastly different skills than those required to build intersectoral collaboration. Consequently, coordinators that were employed at a sport service organisations often felt limited

to taking on operational roles, as these roles aligned with the professionals background that was inherent to their position. The resources available at these organisations may not be adequate to hire staff with more strategic competencies for building intersectoral collaborations, as these competencies typically fall outside the scope of their staffing needs.

Implications for practice

Our findings highlight the need to carefully consider where the coordinator of a local intersectoral collaboration will be employed and to provide adequate funding. In general, within the JOGG approach coordinators are hired by local municipalities. Although the national JOGG organisation provides a potential job description to guide the recruitment process - emphasizing necessary planning, networking and strategic competencies - the local recruitment procedures vary considerably. The pivotal role of coordinators' competencies in fostering intersectoral collaboration success implicate that stricter oversight over these procedures is necessary. In addition, providing adequate funding will enable to hire staff that can focus full-time on building intersectoral collaboration (27,28) as well as hire staff that is specifically trained to apply a strategic role in building intersectoral collaboration and possesses the required strategic competencies.

Moreover, the results of this study have several implications for recruiting, training and supporting coordinators in JOGG approach, which may also inform other programmes that focus on building intersectoral collaborations for health promotion. First, our results suggest that coordinators should be recruited in accordance with the phase of the intersectoral collaboration and should receive the training and support to apply new roles as the intersectoral collaboration progresses. Alternatively, as the collaboration progresses, there may be a need to recruit a coordinator with different, more strategic competencies.

Second, training and support should be tailored to suit the organisational context in which the coordinator operates. Important considerations are the current role and staffing of the organisation. Coordinators operating within a public organisation that is usually oriented towards organising community activities or coordinators with a professional background in such work may require training to transition into more strategic roles. For instance, they may require guidance to understand and leverage the needs and interests of other stakeholders effectively to foster intersectoral collaboration. While, coordinators that are employed by a more strategically oriented organisation or municipal government may require additional support to initially engage other community stakeholders.

Strengths and limitations

A strength of the current study is that we interviewed a heterogenous group of coordinators in terms of experience, employer, working hours appointed for coordination and community characteristics. In addition, we gained insights into coordinators' roles from different perspectives. From the coordinators' own experiences and from the perspective of national JOGG advisors. This outsider perspective facilitated our interpretation of coordinators' experiences and enabled us to explain differences between coordinators.

By selecting the local coordinators through the national JOGG organisation, we were able to recruit a diverse group of coordinators. However, a limitation of this approach was the reduced control over the selection process, thereby increasing the chance of selection bias. This might have led to an overrepresentation of successful JOGG coordinators. While we provided selection guidelines to the organisation, it remains unclear whether additional criteria influenced the selection process and how this might have impacted results. Nonetheless, we believe that the national organisation was highly motivated to ensure an appropriate and diverse selection. We observed significant variation in both the organisational context as well as coordinators roles and competencies.

Furthermore, the sample size of our study was relatively small. Even though no new insights emerged in the final interviews, more interviews may have elicited additional themes.

Due to the explorative and qualitative nature of this study, generalisability of the results is limited. The study was conducted in the Dutch context and more specifically in the context of the JOGG approach. Although intersectoral health promotion has a central role in the JOGG approach, other contexts may yield different results. Nevertheless, since organisational contexts varied widely between coordinators, the results did provide insights into significant elements of the organisational context.

In the current study we focussed on how coordinators perceived their own role. However, it remains unclear whether perceptions of coordinators about their role matched their actual practices. In addition, from this study, we cannot draw conclusions about best practices in the coordination of an intersectoral health promotion approach. Future research should therefore verify the findings with a larger sample of coordinators and in other health promotion approaches and could test the extent to which the different organisational contexts and competencies affect the success of intersectoral health promotion.

CONCLUSIONS

In the JOGG approach coordinators take on diverse roles. How coordinators perceive and fulfil their role is influenced by the phase of the intersectoral approach, and organisational context, including the organisations role and resources and the coordinators' professional background and additional responsibilities for their employing organisation. This study highlights that the need to carefully consider where the coordinator of a local intersectoral collaboration will be employed and that coordinators should receive training and support suited to the organisational context and implementation phase. Implications from this study can inform and improve the recruitment of and support for coordinators of intersectoral collaborations.

Abbreviations

JOGG (Gezonde jeugd, Gezonde toekomst, Dutch): Healthy youth, Healthy future

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Chapter 5

Uncovering the key working mechanisms of a complex community-based obesity prevention programme in the Netherlands using ripple effects mapping

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Published in:
Health Research Policy and Systems. 2024;
<https://doi.org/10.1186/s12961-024-01182-y>

ABSTRACT

Background: Much remains unknown about how complex community-based programmes can successfully achieve long-term impact. More insight is needed to understand the key mechanisms through which these programmes work. Therefore, we conducted an in-depth study in five communities that implemented the Healthy Youth, Healthy Future (JOGG) approach, a Dutch community-based obesity prevention programme. We aimed to identify perceived outcomes and long-term impacts among local stakeholders and explore potential causal pathways and working mechanisms.

Methods: We used ripple effects mapping (REM), a qualitative participatory method to map outcomes and identify causal pathways, in five communities. We involved 26 stakeholders, professionals and policymakers affiliated with the local JOGG approach, spread over eight REM sessions and conducted individual interviews with 24 additional stakeholders. To uncover working mechanisms, we compared outcomes and causal pathways across communities.

Results: Over five to nine years of implementation, participants perceived that JOGG had improved ownership of local stakeholders, health policies, intersectoral collaboration and social norms towards promoting healthy lifestyles. Causal pathways comprised small initial outcomes that created the preconditions to enable the achievement of long-term impact. Although exact JOGG actions varied widely between communities, we identified five common working mechanisms through which the JOGG approach contributed to causal pathways: 1) creating a positive connotation with JOGG, 2) mobilising stakeholders to participate in the JOGG approach, 3) facilitating projects to promote knowledge and awareness among stakeholders while creating successful experiences with promoting healthy lifestyles, 4) connecting stakeholders, thereby stimulating intersectoral collaboration, and 5) sharing stakeholder successes that promote healthy lifestyles, which gradually created a social norm of participation.

Conclusions: the JOGG approach seems to work through activating initial stakeholder participation and bolstering the process towards ownership, policy change, and intersectoral collaboration to promote healthy lifestyles. Key working mechanisms can inform further development of JOGG as well as other complex community-based prevention programmes.

BACKGROUND

Childhood overweight and obesity are a worldwide health concern (1,2) with vast consequences for children's health and well-being(3–6) as well as population health and the economy(1,7). Implementing community-based obesity prevention programmes has been an important strategy for overweight prevention in the population (7–9). These programmes address the environmental drivers of unhealthy behaviours by involving community stakeholders in the development and implementation of actions that fit the local situation.

In the Netherlands, a widely implemented community-based programme is the Healthy Youth, Healthy Future (JOGG) approach, which is currently active in more than two-thirds of the municipalities in the Netherlands. JOGG aims to promote a healthy lifestyle among children and youth (0–21 years old) as well as prevent obesity by creating a health promoting environment in different settings (school, childcare, sport clubs, and neighbourhoods). To do this, JOGG employs a community capacity-building approach, creating awareness and shared ownership of the problem while supporting local stakeholders' actions (10–13). To foster the transformation towards a health-promoting environment, JOGG implementers continuously adapt their strategy to the changing local context, the response of stakeholders, and emergent outcomes (10,14). Successful implementation is therefore considered to vary between contexts and over time.

Much remains unknown about the working mechanisms of complex community-based obesity prevention programmes, such as the JOGG approach. Although some key elements and principles for best practices have been identified (11,13,15), few scholars have extensively investigated the complex process from implementation to outcome and long-term impact (16–20). Process evaluations of community-based programmes to date have focussed on measuring implementation (such as exposure and fidelity) or changes in predefined outcomes (such as environmental changes) (17) and therefore provide limited insight into *how* the programmes produce outcomes (21). Additionally, most researchers have not considered complexity of the implementation of community-based programmes: the unintended and emergent outcomes (22)(14,23), long-term impact, the complex causal chain through which the programme interacts with the context (17,23,24) and how outcomes, impact and successful implementation strategies consequently vary between contexts and evolve over time (14,25).

Gaining insight into the complex causal chain through which community-based programmes contribute to outcomes and impact could significantly improve the understanding of how they work (17,21) and how lasting results are achieved. This involves examining which outcomes emerge over time – including those that extend beyond intended programme outcomes – and studying the interactive implementation process through which different programme elements, contextual elements, and outcomes eventually lead to long-term impact (10,14,23,24). Since local stakeholders play a key role in community-based programmes, involving them is essential to gain a better understanding of how the programme works (26).

A promising method for identifying emergent outcomes, long-term impact, and the series of events through which these are accomplished is ripple effects mapping (REM) (27–29). REM is a qualitative participatory method that engages stakeholders who are involved in or affected by the programme in mapping the intended and unintended outcomes and impacts or ripples. Instead of attributing outcomes to the programme, REM focusses on the contribution of programme implementation to outcomes and impacts within the context. Consequently, applying REM can elucidate how outcomes on different levels and settings are related (30) and how combined efforts (from the programme as well as other initiatives in the community) work synergistically to support long-term impact (27).

Therefore, in this study, we applied REM to identify the outcomes and long-term impacts of the JOGG approach as perceived by local stakeholders and to explore potential causal pathways to these outcomes and impact. By gaining insights into the causal pathways in different contexts, we can identify the key working mechanisms of the JOGG approach, which can inform further development of the JOGG approach and other community-based obesity prevention programmes (10).

METHODS

We applied a qualitative study design based on REM guidelines (27,28). We conducted this study in five JOGG communities, which we defined as an area where the JOGG approach has been implemented, usually one or more neighbourhoods in a municipality in the Netherlands. A local JOGG team, which comprises a policy officer and programme coordinator, is responsible for implementation. Further details regarding methodology are available in Supplementary File 5.1.

Participants

Potential JOGG communities for this study were randomly selected from a list of those where the JOGG approach had been implemented for at least five years prior to our study ($n = 89$). We purposively sampled for maximum variations in population size, the coordinator's employing organisation, and working hours per week appointed for the JOGG approach. These characteristics have previously been identified as relevant factors for variations between communities (31,32). Previously we conducted case studies in nine communities (for more detail, see (33)); of these, we invited the six communities that implemented JOGG as a distinct programme to participate in REM. One community declined because of a lack of time and staff turnover. We chose to exclude the three communities that integrated JOGG fully into another programme because the focus of the programme in these communities had undergone substantial changes over the years, and the implementation of JOGG as such and use of the JOGG name had diminished (33). Therefore, gaining insight in JOGG outcomes and causal pathways would have been more difficult and required a different approach. Table 5.1 presents the characteristics of the five participating communities.

For each community, we composed a list of organisations or persons who had been involved in the JOGG approach, through a local JOGG partnership or collaboration with the local JOGG

team in the past, using existing programme plans and suggestions from the local JOGG team. These stakeholders were invited to participate in a REM session. Table 5.1 also presents the number of participants per session in each community. Participants included professionals from schools, childcare, youth work, health service organisations, sport service organisations, private organisations (e.g., supermarket) and policymakers. After each REM session, we asked participants to suggest other stakeholders whom they considered relevant to improve our understanding of the JOGG implementation process in their community. Suggested stakeholders were then invited to participate in an additional individual interview. In total, 54 people were invited to participate in either an REM session or interview; four declined participation due to a lack of time.

Table 5.1 Characteristics of participating JOGG communities

Case	Start year of JOGG in the community	Population size of JOGG community ^a	Implementing organisation ^b	Hours appointed for JOGG coordination (per week)	Number of participants
1	2016	Small	Public health service	24	REM Session 1: $n = 5$ REM Session 2: $n = 4$ Additional interviews: $n = 2$
2	2012	Medium	Social welfare organisation	32	REM Session 1: $n = 3$ REM Session 2: $n = 3$ Additional interviews: $n = 8$
3	2014	Large	Municipal government	28	REM Session 1: $n = 3$ Additional interviews $n = 4$
4	2012	Medium	Sport service organisation	20	REM Session 1: $n = 2$ REM Session 2: $n = 3$ Additional interviews $n = 5$
5	2015	Small	Sport service organisation	0	REM Session 1: $n = 3$ Additional interviews $n = 5$

^aSmall (< 50,000 residents), medium (50,000–100,000 residents), large (100,000–170,000 residents)

^bMunicipal government or public organisations

Data collection

All data was collected between February and August 2022. We conducted eight REM sessions with 26 participants in total and 24 additional individual interviews. All REM sessions and interviews were conducted online, initially because of the coronavirus disease (COVID-19) regulations and later to maintain consistency in research methods as well as to accommodate participants' schedules. We performed the REM sessions in small groups to facilitate online discussion, and we aimed to include between three and six participants in each session, which resulted in one or two sessions in each community.

REM sessions lasted between 75 and 90 minutes and two facilitators were involved in each session (IH and MH). Additional interviews were conducted by one interviewer (either IH or MH) and lasted approximately 30 minutes. All sessions and interviews were audio recorded and transcribed

verbatim. Informed consent was collected from all participants before the REM session or interview. Protocols for the REM sessions and interviews can be found in Supplementary File 5.2.

Ripple effects mapping sessions

We developed the protocol based on REM guidelines (27,28), primarily following the theming and rippling method described by Chazdon et al. (2017). IH facilitated the discussions during all REM sessions. Meanwhile, MH mapped discussions onto the online whiteboard tool Miro (34). The whiteboard was visible for participants and we aimed for the mapping process to be a joint exercise. Therefore, participants were asked to review how their comments showed up on the map and share their suggestions for changing the map if it did not reflect what they said. In addition, the facilitators asked clarifying questions to verify how the map could illustrate the discussions.

The four steps in each session began with discussions regarding the outcomes of which participants were most proud (appreciative inquiry) and were most important from the JOGG approach in the community. Second, facilitators mapped the outcomes onto the online whiteboard and prompted participants to add other outcomes.(34)The map distinguished direct outcomes, indirect short-term outcomes, and indirect long-term outcomes. Participants were also prompted to consider unintended or negative consequences. Actions undertaken by the JOGG team were added to the map when mentioned by participants. Third, facilitators and participants discussed the relationships between outcomes and the ripple effects of these outcomes. Finally, facilitators asked the participants to reflect on the most interesting facets of the map, noting any missing elements and possible improvements as well as next steps in the local JOGG approach.

Each REM session resulted in a complete map. After each session, facilitators tidied the map and checked it against the audio recordings to ensure the map accurately described the discussions throughout the session. In the communities in which we conducted two REM sessions we combined the two maps. New information from the second map was incorporated into the first map. We clustered similar outcomes and processes, while retaining the original wording from both maps. After all REM sessions in the community, the (combined) map was sent to the participants to verify whether the map adequately illustrated their ideas. We directly incorporated the minor adaptations that we received from participants into the map.

We refined the REM protocol after each session. For example, we noticed significant variations in the extent to which participants were involved in the JOGG approach. This prompted us to add further differentiation in the interview protocol. For those participants who were substantially involved in the JOGG approach, we followed the theming and rippling method to gain insight into the broadness of all JOGG outcomes. For those participants who had been involved in the JOGG approach to a limited extent (i.e. in one small project), we assumed an in-depth approach, asking them to share their stories and outcomes to create more detailed descriptions.

Additional interviews

As suggested by Chazdon et al. (2017), we conducted additional individual interviews with stakeholders who were not present in the initial REM sessions to acquire further details regarding certain parts of the maps. In these interviews, we focussed on discussing the ripples in which the stakeholder had been involved. First, we asked participants to report the outcomes that produced the most personal pride, and the most important outcomes of JOGG in the community. Second, we asked participants to share their stories about these outcomes and specific parts of the map in which they were involved. We added the input from the additional interviews to the ripple effects map where necessary.

Analyses

The REM sessions and the additional interviews resulted in one map per community, which comprised the merged maps from the two REM sessions with further details from the additional interviews. IH coded the transcripts from the REM sessions and interviews according to the completed maps, using the MAXmaps function in MAXqda, which enables graphic data representation. The result of this coding phase was a tidy map with underlying data segments for each community. These maps formed the starting point for analysis.

Following recommendations from Nobles et al. (2022) and Peterson et al. (2019), data analysis was an inductive and iterative process. First, IH conducted a thematic analysis of the outcomes and long-term impact of JOGG as perceived by community stakeholders to acquire insight into the types of outcomes that participants associated with the JOGG approach. Second, we focussed the analyses on causal pathways, following the guidelines of Nobles et al. (2022) to identify and analyse 'impact pathways': chains of actions and outcomes within the REM maps. For each community, three members of the research team (IH, MH, DC) identified these pathways to long-term impacts and subsequently analysed how these long-term impacts were connected to other outcomes and JOGG actions to illustrate how the programme works (28,29).

Third, we conducted a cross-case analysis (35,36) to identify common patterns and to explain differences between communities. IH, MH, and DC used the maps and identified impact pathways from the five communities to jointly analyse and discuss (1) how outcomes related to each other to support each type of long-term impact identified by the thematic analysis in the first step (2) JOGG's role in accomplishing outcomes and impact and (3) feedback loops in the process. During analyses and discussion, we iteratively compared the cases, gradually generating overarching causal pathways for each long-term impact. By moving to a higher level of abstraction, the final overarching pathways were applicable for all communities.

RESULTS

The results section first describes local stakeholders' perceptions regarding JOGG's outcomes and long-term impact. Then, we present causal pathways to these long-term impacts and we explain key mechanisms through which JOGG contributed to these pathways.

Outcomes and long-term impact of the JOGG approach

Table 5.2 summarises the outcomes and long-term impacts that participants perceived to be associated with the JOGG approach in their community. Outcomes that participants believed to be direct outcomes of the JOGG approach were divided into three themes: (a) the commitment of organisations, (b) the implementation of activities that were developed in collaboration with the local JOGG team, and (c) changes in children and parents. Participants for example, noted that children were more knowledgeable about healthy nutrition or drinking more water than they had been:

What we constantly emphasise is, 'guys, if you have a moment of rest or anything, don't grab cola or chips.' That was done initially, but now, there's just a water tap about a metre or two away, and it's being used a lot. When we have a break, they all line up and drink from the water tap. (sport service C3)

Participants also described numerous long-term impacts; sustainable changes that manifested over several years and to which they believed JOGG had contributed. These long-term impacts comprised four themes. First, stakeholders associated JOGG with strengthened intersectoral collaborations to promote healthy lifestyles, especially between public organisations in the community (e.g., youth work and public health service). Second, according to participants, JOGG had contributed to a level of ownership for promoting healthy lifestyles in relevant community organisations. Third, participants associated JOGG with developed policies both at the municipal level and within organisations to promote health, such as school nutrition policies. Fourth, participants noted that JOGG had contributed to a change in social norms regarding the promotion of healthy lifestyles. Participants explained that some health promotion actions had become routine within their organisation or within the community overall and that an increasing number of organisations now assumed responsibility for promoting healthy lifestyles:

In practice, we really see that drinking water, eating vegetables, it's becoming more of a norm, especially at events and sports days. But also, at children's healthcare centres it is a more discussed topic. More and more childcare organisations and schools are getting involved.
- health service C1

I remember when we had just started with JOGG. We organised a school soccer tournament, and they were distributing lemonade and chips and all kinds of unhealthy stuff. That is unthinkable now. - school C2

In none of the five communities participants had mentioned negative outcomes of the JOGG approach. However, they did reflect on areas for improvement. For example, participants expressed doubts about whether the actions implemented by stakeholders effectively reached the children who needed it the most.

Table 5.2 Summary of JOGG outcomes and long-term impacts according to participants

Themes	Identified outcomes
Stakeholder commitment (public and private)	Familiarity with JOGG Support of JOGG's goals Awareness of their role in promoting healthy lifestyles Knowledgeable about health and why promoting healthy lifestyles is important Motivation and enthusiasm to participate in JOGG Willingness to promote healthy lifestyles
Implementation of actions to promote healthy lifestyles	Implementation of activities to promote knowledge and awareness about physical activity and healthy nutrition in children and parents Implementation of activities to promote physical activity and motor skills Implementation of interventions aimed at children with overweight
Individual-level outcomes	Increased awareness and knowledge among parents and children about a healthy lifestyle Healthier food and drink choices and increased participation during organised neighbourhood events for children Increased water consumption among children
Themes	Identified long-term impacts
Intersectoral collaboration for promoting healthy lifestyles	Increased awareness of and contact with other organisations regarding health promotion Reduced overlap between similar organisations New collaborative projects that promote a healthy lifestyle Strengthening existing projects (e.g., by better connecting different projects)
Stakeholder ownership for promoting healthy lifestyles	Stakeholders' knowledge of their status as role models Stakeholders' integration of healthy lifestyles into their daily work Stakeholders' active encouragement towards healthy lifestyles across the community
Policies that promote healthy lifestyles	Policy changes in schools (e.g., about drinking water at school, fruit snacks, birthday treats) Policy changes in childcare centres and preschools (e.g., lunch meals, outdoor play, fruit snacks) Policy changes in sport clubs (e.g., changes to the canteen, drinking water, healthy snacks at events) Healthy lifestyle activities embedded in organisational routines Resources for promoting healthy lifestyles integrated in municipal health policy
Change in social norms regarding the promotion of healthy lifestyles	Increasing numbers of organisations promoting healthy lifestyles Normalising responsibility to promote healthy lifestyles

Causal pathways

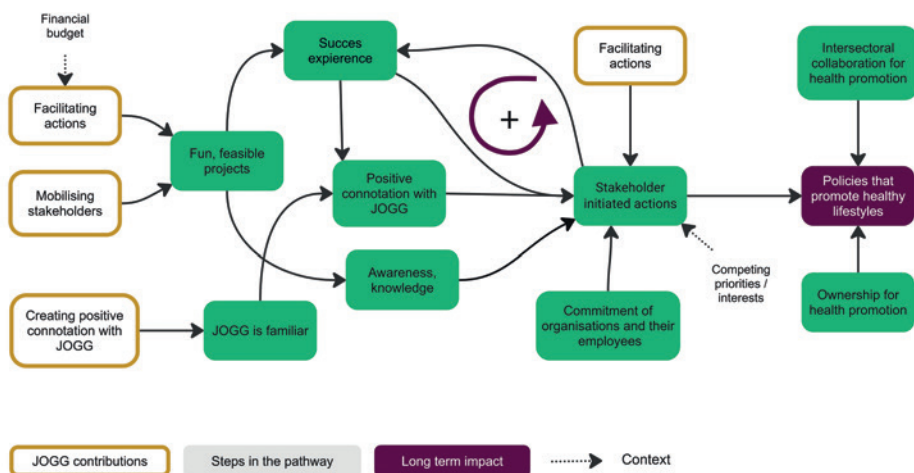
The ripple effects maps revealed how different outcomes rippled into long-term impacts, thus demonstrating the various series of smaller steps that are needed to create impact. We describe the causal pathways – the chains of interacting actions and outcomes – of the four long-term impacts: policy changes, stakeholder ownership, intersectoral collaboration, and social norm changes regarding the promotion of healthy lifestyles.

Causal pathway to implement policies that promote healthy lifestyles within stakeholder organisations

Figure 5.1 illustrates the pathway to policies within stakeholder organisations that promote healthy lifestyles. First, JOGG teams mobilised stakeholders by establishing initial contact and lobbying for participation in the JOGG approach or promotion of healthy lifestyles. Participants described that this contact had been essential to encourage their involvement in the beginning:

In the beginning, when JOGG was still small, the coordinator physically went to all the schools. So, I regularly had conversations with the coordinator. Just that aspect of awareness, even within ourselves, because we have to convey it to those children. So yeah, lobbying in the beginning and investing that energy in all those conversations, I think that has been very intense, but I think it has certainly been very good. - school C5

Figure 5.1 Causal pathway to implement policies that promote healthy lifestyles



Additionally, JOGG teams created a positive connotation with JOGG among relevant local stakeholders by, for example, being visibly present at events or communicating through social media. The increased familiarity with JOGG and positive connotation that this created furthered the JOGG team's efforts in establishing initial contact with stakeholders.

Second, after stakeholders were mobilised, the JOGG team facilitated a small project at the stakeholder organisation that were usually feasible and fun, a water-drinking day or a running event for example, so that it was easy for stakeholders to participate. Although such small and incidental projects alone would not immediately change children's lifestyles, they catalysed further actions by creating stakeholders' knowledge and awareness about healthy lifestyles and formed a stepping stone to continue their efforts regarding upcoming projects. A participant described this process as follows:

I think that JOGG is able to create an accessible entry point where the school starts to think and becomes aware that there's more to education than just teaching math and Dutch. They consider practical ways for the school to contribute to the health of the children. Drinking water is super tangible, very accessible, and actually very easy to implement. This brings about an awareness within the school to further explore how can we do things outside the regular curriculum for the well-being and health of the children. - health service C2

Third, organisations continued their efforts to promote healthy lifestyles. This ranged from participating in another project facilitated by JOGG to initiating projects themselves. An important condition for continuing efforts was organisational commitment to participate in JOGG and promote healthy lifestyles. Additionally, successful experiences were an essential mediator to continue efforts. Achieving successes created a positive connotation with JOGG and the benefits of healthy lifestyles. For example, one participant explained that their school now pays the costs to sustain the project after first experiencing the benefits:

I'm now using that lifestyle coach again, but the school now has seen that it benefits us, so now we also pay her. [...] When the school notices that hey, this works, or we really benefit from this, you see that the school also allocates budget for it. Whereas if that hadn't been the case, if I had approached them saying, 'Oh, there is a lifestyle coach who wants to work with us, but it costs so much', then the school would have said, 'We don't have space for that now; maybe next year'. - school C3

Successful experiences initiated and reinforced a feedback loop, thereby increasing stakeholder motivation and commitment to participate in new projects, which created new successful experiences. To attain success, proper project facilitation by JOGG was essential because the goal needed to suit stakeholders' needs and routines, and budgets were needed to organise the project.

Fourth, after multiple successful experiences, stakeholders moved from incidental projects towards organisational policy changes. This was described as a slow process that comprised small steps. For example, one participant stated the following:

That is gradual, you know. Thinking like, okay, first, let's focus on water, and then afterward, we'll look at making the sandwiches a bit healthier too, instead of just white bread with chocolate spread. So, I think that's really the next step we need to start working on. - childcare C3

Policy changes were facilitated by intersectoral collaborations and organisational ownership. Intersectoral collaborations provided the means to implement policies; for example, sport organisations could structurally organise physical activities at school, whereas organisational ownership for promoting healthy lifestyles was essential to implementing policy changes. As one stakeholder stated,

If you want to move away from juice boxes and transition to drinking water, it takes a few years; you cannot suddenly say, 'Let's change'. Teachers also need to understand why that is important, just like eating fruit or physically active learning, they just need to experience it. - school C4

Causal pathway to encourage stakeholder ownership for promoting healthy lifestyles

Figure 5.2 Causal pathway to encourage stakeholder ownership for promoting healthy lifestyles

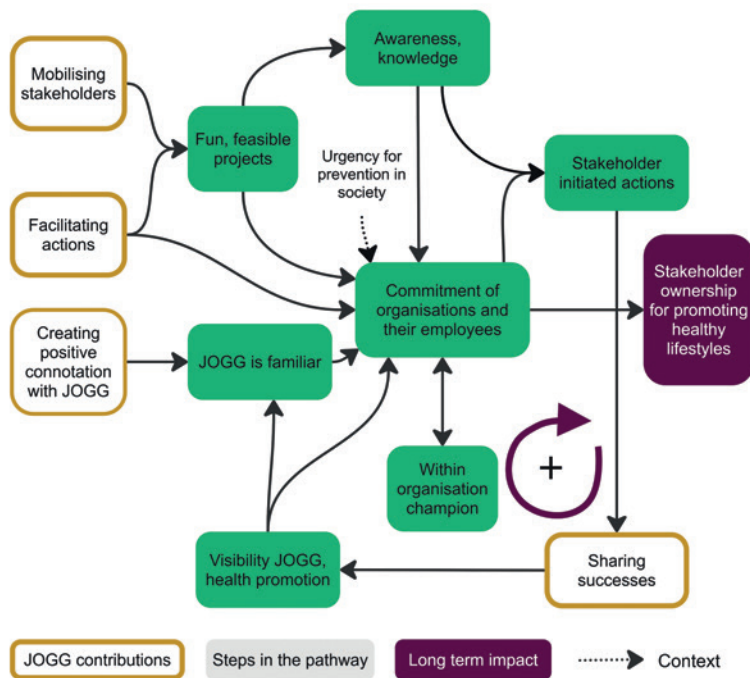


Figure 5.2 portrays the pathway to stakeholder ownership for promoting healthy lifestyles in children and youth. The first step in this pathway was the development of stakeholder awareness and knowledge, stimulated by the fun and feasible projects that JOGG facilitated. General knowledge and awareness of healthy lifestyles combined with knowledge about children's healthy lifestyles as well as familiarity with JOGG and their goals resulted in stakeholder commitment to participate in the JOGG approach. Several participants noticed that organisational participation in JOGG had

additionally increased over the years because of a growing urgency for prevention in society and national policy:

Look, 15 years ago you really did not stand a chance with sport clubs to implement a healthy sport canteen. [...]. They would have kept the door closed back then. But now, given the developments in society, they open the door. - sport service C4

Second, after commitment from one or several individuals within a stakeholder organisation, these stakeholders became champions who spread awareness within their organisations to achieve the commitment of all employees involved:

At one point, there was a teacher who was interested in the theme. When she started getting involved and the principal eventually began giving her space to work with JOGG, that's when things really started taking off. She became the contact person for the school; she also initiated various initiatives and implemented them. - sport service C4

Third, JOGG teams actively created visibility of stakeholders' actions to promote healthy lifestyles by sharing successes, thereby catalysing a reinforcing feedback loop. For example, they celebrated the opening of a healthy canteen or water tap with an official visit from a local politician, and they published stories about initiatives in local newspapers. The visibility of JOGG and stakeholders' actions to promote healthy lifestyles stimulated other stakeholders to participate. Different stakeholders stated that they learnt about other stakeholders' actions through newsletters or social media, which normalised engagement in promoting a healthy lifestyle. As one participant related,

Those newsletters are really comprehensive; they contain everything they do. For instance, if a school achieves a certificate, they mention that. Recently, in November, it was about the drinking water lessons, and they also mentioned that we did those lessons, you know. [...] You can also see it happening in other schools and even in secondary education. So, I have a feeling that it's becoming more and more normal, so we can try to achieve that within our school as well. - school C2

The more stakeholders were committed to and participated in promoting children's healthy lifestyles, the more visibility they received, and the more other stakeholders became aware of their role in promoting healthy lifestyles.

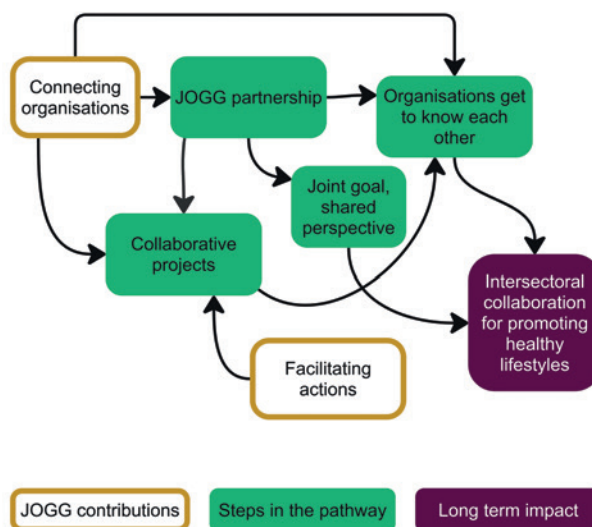
Fourth, stakeholders' commitment and awareness of their role in promoting children's healthy lifestyles eventually evolved into ownership, which meant that employees within the stakeholder organisations actively assumed responsibility to promote healthy lifestyles. One participant described the following:

Without me specifically asking for it, all the treats that were made during the Saint Maarten event were healthy. So, at that point, I thought, 'Okay, I do not need to do anything anymore.'
- school C3

Similar to implementing policy changes, the pathway to ownership for promoting healthy lifestyles was described as a gradual development over the years.

Causal pathway to foster intersectoral collaboration for promoting healthy lifestyles

Figure 5.3 Causal pathway to foster intersectoral collaboration for promoting healthy lifestyles



The third causal pathway that we identified was the pathway to intersectoral collaboration for promoting healthy lifestyles (see fig. 5.3). This pathway was initially enacted when the JOGG team connected different projects and organisations, either directly or by involving various stakeholders in a collaborative project. The JOGG team then facilitated such collaborative projects by providing materials, budget, and expertise or by managing the project to ensure smooth collaboration. Another way they united organisations was by forming partnerships in which different stakeholders were involved and collaborated. This provided joint goals through a mission that connected the stakeholders, which heightened their motivation to promote healthy lifestyles and stimulated their collaboration. For example, one participant described a partnership meeting:

Yeah, that was really a moment when we thought, 'Wow, that's really cool'. The councillors were there, and all the policymakers were there, and everyone said, 'Yes, this is really what we find important.' I went home feeling inspired, thinking, 'Wow, we're all in this together.' - youth work C5

Participants explained that the most important result of connecting with other stakeholders was that they became aware of each other and each other's work. This in turn strengthened intersectoral collaboration, leading to new initiatives:

We easily contact each other and thereby organise activities. For example, the toddler evening walk event. We as a childcare organisation sponsor it, the sport service organises it, the supermarket is also involved. That is how we get a lot of children active. [...] and that connection between the organisers has already been established in the past [by JOGG], and we are now making use of it. JOGG is not involved in this activity itself. - childcare C2

Intersectoral collaboration, in turn, facilitated the implementation of health promotion actions within the individual organisations. For example, structural intersectoral collaboration between a supermarket and a sport organisation enabled the sport organisation to provide fruit during their activities.

Combined causal pathway to change social norms towards promoting healthy lifestyles

Jointly, ownership, policy changes, and intersectoral collaboration contributed to a healthy lifestyle becoming the social norm. Participants described that the social norms changed because numerous community stakeholders assumed ownership for promoting children's healthy lifestyles and embedded this in their policies. The more stakeholders demonstrated ownership and changed policies, the easier and more natural it became for others to participate as well:

When I look back at a few years ago, schools and sometimes parents were hesitant to say, 'Yes, my child has to drink water'. They found that very difficult. Well, now, if they know that it is also happening at school, you just hear them say, 'Yes, at school you have to, so we do that here too'. That broadening, that normalisation, really helped. - health service C2

Participants additionally recognised that policy changes needed to be implemented across numerous organisations in different sectors to impact health:

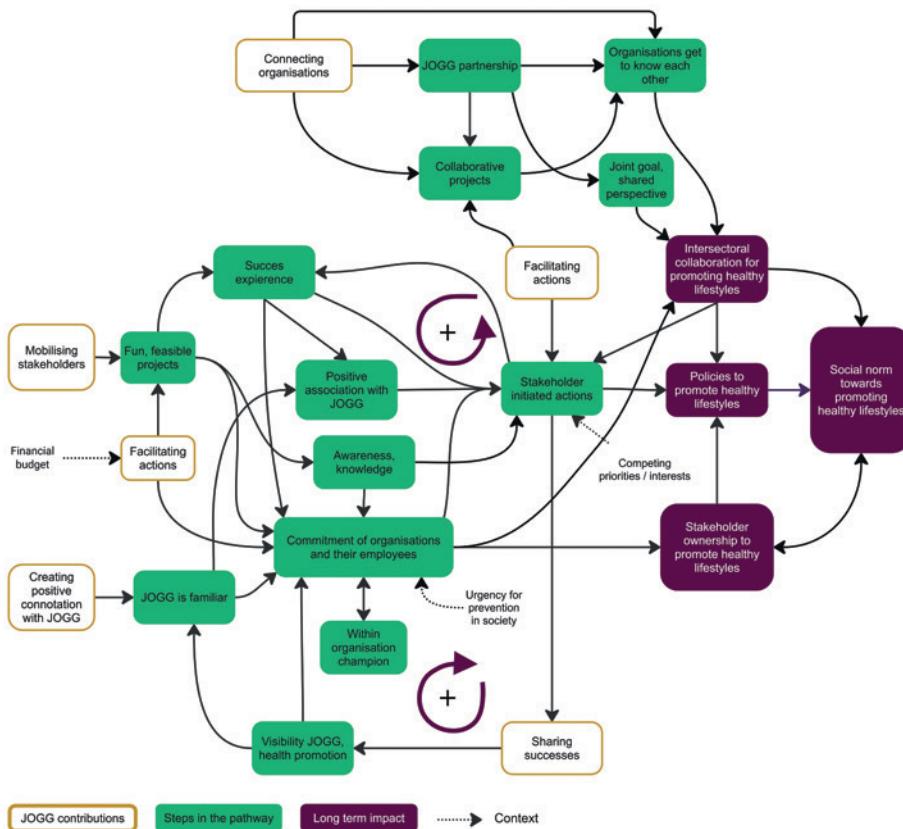
At [an after-school programme], they have really strict policies regarding healthy nutrition. But we all need to do it together, right? So, it is great that the after-school programme does not give too many unhealthy things, but if then, if we at five minutes before school ends, we give something like an ice cream with 299 calories, then we are not doing it right. - school C5

Key mechanisms of the JOGG approach

Figure 5.4 portrays how the causal pathways related to each other and the key mechanisms through which JOGG contributed to these pathways. We identified five key mechanisms: connecting organisations, facilitating actions, creating a positive connotation with JOGG, mobilising stakeholders, and sharing successes. These contributions are the key mechanisms that activate the impact pathways and enable the JOGG approach's success. We found that all key mechanisms

were present in all communities. However, JOGG teams varied in the mechanisms on which they focussed, as these were dependent on the community possibilities and the team skills.

Figure 5.4 Causal pathway to change social norms towards promoting healthy lifestyles



Actions that were implemented by the JOGG team to achieve each key mechanism varied. Table 5.3 presents the types of actions that were conducted for each mechanism. For example, creating a positive connotation with JOGG was achieved using communication materials (e.g., social media), organising a community-wide campaign, or by being visibly present at events or activities. Some actions achieved multiple key mechanisms; for example, by organising stakeholder meetings, the JOGG team connected organisations and mobilised them for action.

Table 5.3 Summary of key mechanisms and types of action for each key mechanism

Key mechanism	Implemented actions
Connecting organisations	Contacting and connecting stakeholders personally Maintaining an overview of community initiatives and stakeholders Coordinating working group meetings with organisations Being involved in other health initiatives Organising partnership meetings Organising a health week to which stakeholders contribute Promoting healthy lifestyles through ambassadors within one's own organisation
Facilitating action	Initiating collaborative projects Managing projects Providing resources (materials, finances, or sponsorships) Providing expertise Offering evaluations Communicating about potential resources (personally, through website, or concrete offers for schools)
Creating positive connotations with JOGG	Sharing activities and successes through fact sheets, newsletters, and social media Organising partnership meetings Organising campaigns Organising a health week to which stakeholders can contribute Being visibly present at events by, for example, distributing fruit and water Promoting JOGG activities through ambassadors within one's own organisation
Mobilising stakeholders	Contacting stakeholders personally Organising partnership meetings Initiating collaborative projects Celebrating and sharing successes Conducting progress and needs meetings with schools Organising campaigns Organising a health week to which stakeholders can contribute
Sharing successes	Promoting the achievement of certificates or badges that are provided by the national JOGG organisation or other national organisations (e.g., national food centre or healthy school canteens) Celebrating successes by, for example, organising a party or event at the opening of a new water tap Sharing activities and successes through fact sheets, newsletters, and social media Using partnership meetings to allow stakeholders to promote their successes

DISCUSSION

In this study, we used REM to explore the outcomes, long-term impact, and causal pathways in a community-based programme for child health promotion and obesity prevention in the Netherlands (the JOGG approach). Local stakeholders perceived JOGG to contribute to four types of long-term impacts: 1) new policies that promote healthy lifestyles in organisations and local government, 2) increased ownership of healthy lifestyles among stakeholders, 3) improved intersectoral collaboration, and 4) increased positive social norms among stakeholders towards the promotion of healthy lifestyles. The causal pathway to these impacts comprised small initial

outcomes, such as stakeholders supporting JOGG's goals and participating in feasible projects. These created preconditions, for example, stakeholders' awareness and knowledge of their role in health promotion, that eventually enabled the achievement of long-term impact.

Although the exact actions that were implemented varied widely between communities, the underlying working mechanisms were similar. We identified five key working mechanisms through which JOGG activated and catalysed the process towards long-term impact across all five communities. Mechanisms that prompted initial participation in the JOGG approach included 1) creating a positive connotation with JOGG so that stakeholders were familiar and willing to participate, 2) mobilising stakeholders for participation, 3) facilitating projects to promote knowledge and awareness in stakeholders. After stakeholders were involved, it remained important to facilitate projects to enable successful experiences with promoting healthy lifestyles, which in turn increased willingness to do more. Other mechanisms that catalysed the process towards long-term impact included 4) connecting stakeholders to stimulate the intersectoral collaboration that is needed to effectively promote healthy lifestyles, and 5) sharing successes to make stakeholders' activities visible, which gradually created a norm of stakeholder participation and ownership to promote healthy lifestyles.

We found REM (27,28) to be a useful method to acquire an understanding of how the JOGG approach works. First, the participatory mind-mapping approach was useful to gain insight into participants' experiences, as it allowed participants to share their stories and reflect on outcomes and barriers that were important to them while concurrently and systematically discussing the JOGG approach as well as community health promotion. The element of appreciative inquiry created a positive energy in the sessions, especially with participants who had been closely involved with the JOGG approach since it allowed them to see how their efforts gradually unfolded.

Second, REM offered a systematic way to capture the various outcomes of the JOGG approach, including those that emerged over time. Outcomes of community-based programmes can vary significantly across communities (10). REM provided a broad picture of potential outcomes and impacts, which we would not have been able to capture when studying a predefined set of outcomes. For instance, while we observed policies that promoted healthy lifestyles across all communities, the nature of these policy changes varied widely. In one community, physical activity interventions were developed and structurally implemented by schools, whereas another community focussed on water-drinking policies in childcare centres, and yet another community integrated annual lessons to promote cycling to school.

More importantly, REM allowed us to improve our understanding of JOGG's working mechanisms. By capturing interactions between different outcomes and actions of the implementing team, REM provided insight into how JOGG contributed to the complex processes towards impact. We were thereby able to investigate how the JOGG approach stimulated changes to the system driving obesity by, for example, propelling feedback loops and implementing mutually reinforcing actions, rather than assessing how one action led to one specific outcome. Consequently, the working

mechanisms that we identify in this study extend beyond generalised best practices (11,13), barriers, and facilitators to implementation (37) that have been identified in previous process evaluations of community-based obesity prevention programmes. The working mechanisms that we identify can inform future developments in the JOGG approach and other community-based obesity prevention programmes (10) to improve, for example, guidelines for local implementation.

In our study, we added a new step to the REM output analysis to identify JOGG's key mechanisms across contexts. We first followed the approach of Nobles et al. (28) for identifying and analysing causal pathways to impact. Then, we studied the REM output across communities to compare impact pathways, using guidelines for comparative case study research (35,36), which enabled us to move the identified causal pathways to higher levels of abstraction and form more generalisable theories about how the JOGG approach works. This significantly improved our understanding of key mechanisms in the JOGG approach. Although the types of actions implemented in different communities varied, we believe that the function of these actions in the causal pathways was similar, which aligns with suggestions that complex programmes define the function of key programme elements instead of the specifying the precise form in which the programme elements should be implemented (24,38).

Strengths and limitations

This study has several limitations. First, most of the REM session participants were initially recruited by the local JOGG team, which may have introduced selection bias. Participants who had more negative or neutral experiences may have been less prone to participate and therefore underrepresented, which may have led to an overestimation of JOGG's positive outcomes. We attempted to mitigate these biases by asking participants to critically reflect on JOGG's contributions and potentially negative consequences. Additionally, we deliberately did not include the local JOGG team in the sessions so that we could capture the perspective outside of the programme implementers.

REM sessions were conducted online, partially due to COVID-19 regulations, which was both a strength and a limitation. Online sessions better accommodated potential participants' schedules, which improved their willingness to participate. Therefore, we may have been able to speak to more participants than would have been possible if we had conducted in-person sessions. However, as previous scholars note (39), stimulating interaction and discussion between participants is more challenging online. To facilitate these discussions, we conducted shorter REM sessions in smaller groups. Consequently, the ripple effects maps were generated in different subgroups and later merged by the researchers. We found that maps from different sessions often complemented each other, and we asked participants to verify the merged maps; however, this process may still have elicited different results than one large REM session in which participants jointly work towards a shared understanding (39).

Finally, the retrospective design allowed us to acquire insights into the long-term impacts of the JOGG approach and the processes that enabled these impacts; however, notable limitations of the

retrospective design are recall and selection biases (36). The longer JOGG had been implemented in a community, the more difficult it was for participants to recall events and the fewer participants we found who had been involved since the beginning. Consequently, JOGG's outcomes and contributions in the process may have been overestimated. As proposed by Nobles et al. (2022), REM sessions are ideally conducted multiple times over the years, which not only prevents recall and selection biases but also allows researchers to gain significantly more detailed insights into the process and aspects of the programme that did not lead to outcomes.

Implications for practice and future research

The results of this study provide a new way of understanding successful implementation of the JOGG approach. Rather than focussing on the exact actions that should be implemented, future JOGG teams should consider how their actions begin the process towards long-term community impact. The five key mechanisms identified in this study can be used by the national JOGG organisation to support successful local implementation. Since these mechanisms are defined on an abstract level of their function, they are applicable in diverse contexts. Thereby, the key mechanisms may inform future implementation of the JOGG approach as well as other community-based programmes for health promotion. Furthermore, the causal pathways towards the long-term impacts described in this study may be used to guide JOGG teams to better understand which small steps are needed to achieve long-term impact and to identify which steps are needed in the current situation.

Moreover, the results of this study provide guidance for monitoring and evaluation. The extent to which the key mechanisms are realised may be indicators for successful implementation. The outcomes that are identified in this study could be monitored to examine the effects of the JOGG approach, which could be supplemented with an examination of emergent outcomes. Notably, few participants associated the JOGG approach in their community with an outcome related to the overarching goals of the JOGG approach: healthier lifestyles and the prevention of overweight, although previous effect evaluations have focussed on such outcomes (40,41). It remains to be determined whether such outcomes can be expected from the current programme and whether these are appropriate indicators for the programme's effects.

In this study, we identified potential outcomes and key mechanisms through qualitative methods. Future researchers could use mixed-methods designs to strengthen the evidence by validating the key mechanisms and outcomes in different contexts (42,43). Qualitative studies can further unpack the key mechanisms and causal pathways that are proposed in the current study, while quantitative studies can validate the outcomes and key mechanisms across contexts by, for example, systematically monitoring the implementation of key mechanisms and potential policy changes in a larger number of communities.

CONCLUSIONS

The long-term impacts of the JOGG approach include stakeholder ownership, policy changes, intersectoral collaboration, and a change in social norms towards promoting healthy lifestyles. REM is a useful method to acquire insight into how the JOGG approach works, as it uncovers interactions between different outcomes and long-term impact as well as the JOGG approach's contributions to this process. By applying REM in five communities, we obtained insight into the causal pathways to impact and key mechanisms across contexts.

Abbreviations

JOGG – Healthy Youth, Healthy Future

REM - ripple effects mapping

COVID-19 - coronavirus disease

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Chapter 6

Evaluating the contribution of a scaled up community-based overweight prevention programme in the Netherlands to children's health behaviours and BMIz

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Under review

ABSTRACT

Community-based overweight prevention (CBOP) programmes are widely implemented, however, little is known about their effectiveness after scale-up. This study examines the contribution of a scaled up CBOP programme in the Netherlands: Healthy Youth, Healthy Future (JOGG) to children's BMIz, adherence to fruit and/or vegetable consumption guidelines, and minutes of moderate to vigorous physical activity (MVPA) per week. We used repeated cross-sectional data from 5-11- and 12-18-year-old participants in the annual Dutch national health survey (2006-2019) and applied two analytical methods for more robust inference. First, we applied linear mixed models to assess the association between JOGG exposure for at least 18 months ($n = 1,008$) vs no exposure ($n = 23,779$) and the outcomes and assessed whether this association differed across subgroups defined by age, socioeconomic position (SEP), or migration background. Second, we compared outcome trends in JOGG and non-JOGG municipalities using a difference-in-differences approach, to account for unobserved time-invariant confounders. Results showed no significant association between JOGG exposure and BMIz or MVPA. However, JOGG exposure was associated with higher adherence to fruit and/or vegetable consumption guidelines in 12- to 18-year-olds (log odds 1.82, 95%CI .23, 3.41). We observed no differential associations across subgroups and no differences in outcome trends between JOGG and non-JOGG municipalities. In conclusion, the scale up of JOGG in the Netherlands between 2010 and 2019 potentially contributed to higher fruit and vegetable consumption but not to BMIz or MVPA levels. Further examination of the implementation process may provide insight in underlying mechanisms and contribution of JOGG.

INTRODUCTION

Childhood overweight and obesity (hereafter referred to as *overweight*) are a worldwide and growing health problem (1) with significant consequences for children's physical and mental health as well as for population health and economies (2). The growing prevalence of childhood obesity is a complex problem driven by multiple interacting economic, social, physical, and political factors (3–5). Obesity levels are not equally distributed across the population; they tend to be higher among children in families with a lower socioeconomic position (SEP) (1,6).

Due to its complex aetiology, childhood overweight prevention requires a holistic and sustainable approach (7). Community-based overweight prevention (CBOP) programmes, which target multiple drivers of unhealthy behaviour in children's living environment with a community-wide approach (5,7), have therefore been suggested as promising (7–9). A key strategy in CBOP programmes is to build community capacity for overweight prevention by raising awareness and ownership for this problem in the community and by providing community stakeholders with the support, skills and resources needed to develop solutions and take collective action (10–12). Thereby, contributing to sustainable changes in the community that promote healthy behaviours.

Various CBOP programmes have been developed and found effective in decreasing overweight prevalence (13–15) and in promoting health equity (16,17) in intervention communities. Consequently, promising CBOP programmes have been scaled up and widely implemented (18); however, data are limited regarding the long-term effect of these programmes after scale-up (19–22). Additionally, it remains unknown whether scaled-up CBOP programmes affect existing inequalities in overweight levels (23), and there are concerns that some programmes may widen inequalities when socioeconomically advantaged groups benefit most from them (23).

We evaluated the effect of the nationwide implementation of a CBOP programme in the Netherlands: the Healthy Youth, Healthy Future (JOGG) approach (24,25). The JOGG approach was initially based on the successful French EPODE programme (26–28) and was first implemented in 2010 in five Dutch municipalities. By 2023, the JOGG approach had been scaled up to 210 municipalities. Previous studies examining the JOGG approach's effect on health behaviours and overweight in children in the Netherlands have reported mixed results and methodological challenges (29,30). Moreover, the JOGG's contribution to reducing inequalities has not been examined.

The JOGG approach has been scaled up by professionals and policymakers; consequently, there has been limited control over implementation, which poses challenges for determining the association between the programme and its outcomes. Once they are scaled up, CBOP programmes are best evaluated using study designs specifically suited to assess the contribution of interventions in which exposure and implementation are not controlled by researchers (31) – i.e. natural experiments (32,33). By combining multiple methods that address different sources of bias, these designs strive for the optimal estimate of the programme's contribution (32).

In this study, we examine the JOGG approach's contribution to the BMI and health behaviours of children aged 5 to 18 years. Additionally, we explore whether JOGG reduces inequalities by examining differential effects among subgroups targeted by the JOGG approach, which are defined by SEP and migration background. To support robust inference (32,34), we applied two approaches to assess the JOGG contribution: first, we estimated the expected difference in the outcomes of individual children who had been exposed to JOGG for at least 18 months compared to non-exposed children. Second, we used a difference-in-differences (DID) approach to examine trends in population average outcome levels over time among children living in municipalities that implemented JOGG compared to children in non-JOGG municipalities.

METHODS

The JOGG approach

The JOGG approach aims at promoting a healthy lifestyle and preventing childhood overweight by creating a health-promoting social and physical environment in different settings where children live, play, and learn (e.g., schools, neighbourhoods, sports clubs). Within a municipality, a local JOGG team builds community capacity with local stakeholders and stimulates them to collectively implement sustainable actions and policy changes within their organisations (24). Outputs vary between municipalities and neighbourhoods; they include, for example, health campaigns and activities, local lifestyle programmes, healthier sport canteens and school lunches, and childcare policies (25,35).

The national JOGG organisation – financed by the Dutch Ministry of Public Health, Welfare and Sport – supports local teams with training, materials, and advice. Teams are encouraged to target specific subgroups with a higher risk of overweight, including children from deprived areas, a lower SEP, and a migration background.

Data

We used repeated cross-sectional data from the Dutch national health survey (36) from 2006-2019 to assess the contribution of JOGG on children's BMI z-scores and health behaviours over time. The survey is conducted annually to follow health and lifestyle developments among the Dutch population; approximately 15,000 people of all ages from across the country are invited to participate, and between 60% and 65% typically respond. We chose not to include data after 2019 because the COVID-19 pandemic impacted programme delivery, data collection processes, and trends in health behaviours in the years that followed.

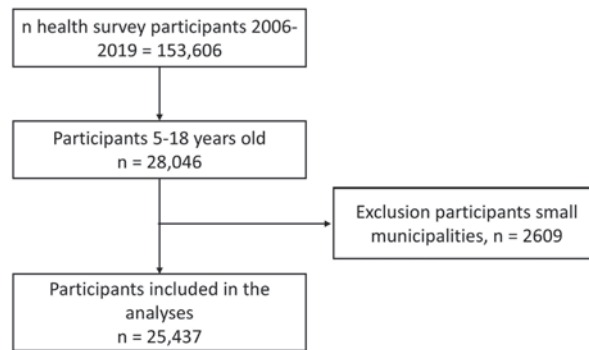
The survey questions for respondents under the age of 12 were answered by a parent or caretaker. Youth aged 12 years and older answered the survey questions themselves. Survey questions for the measures included in this study and the formulation of these questions were consistent across all study years.

Before 2010, the health survey was conducted as a face-to-face interview with an additional paper questionnaire. Since then, respondents have been asked to participate via internet, and those not responding via internet have participated through face-to-face interviews. This change in methodology did not lead to significant breaks in the trends on items included in the current study (37).

Study sample

Figure 6.1 illustrates our selection process for participants included in the analyses. We selected participants from 2006, 5 years before the first municipalities started implementing JOGG, to 2019, and we selected those who were 5 to 18 years of age during that period. We excluded people from municipalities with less than 40 participants between 2006 and 2019.

Figure 6.1 Study participants included in the analyses



JOGG municipalities and exposure

The JOGG approach is usually adopted by a municipality; a local government responsible for a population varying from 10,000 to 150,000 residents. JOGG is then implemented in one or more neighbourhoods in the municipality. Neighbourhoods where JOGG is implemented are often deprived areas. The national JOGG organisation provided information on the municipalities and neighbourhoods where JOGG was implemented (i.e., JOGG neighbourhood) between 2006 and 2019. As a neighbourhood's exact start month of the JOGG approach was often unclear, we considered them a JOGG neighbourhood from the first of January after the officially administered start year.

We defined participant's association with the JOGG approach in two ways. First, we examined whether participants lived in a JOGG neighbourhood at the year of measurement ($JOGG=1$) or lived in a non-JOGG neighbourhood, one that had not yet or never implemented the JOGG approach at the year of measurement ($JOGG=0$). Second, we calculated the number of months that participants had lived in a JOGG neighbourhood after the age of 4, based on current and previous living addresses (using data from Statistics Netherlands). We defined *JOGG exposure* as having lived in JOGG neighbourhoods for at least 18 months (1) versus never lived in a JOGG neighbourhood (0).

Table 6.1 provides an overview of the number of JOGG municipalities and neighbourhoods included in the study as well as the number of exposed and unexposed children.

Table 6.1 Number of JOGG municipalities and neighbourhoods in the Netherlands and number of children exposed to the JOGG approach between 2006 and 2019

	JOGG implementation		Participants		
	Municipalities	Neighbourhoods	JOGG	JOGG exposure > 18 months	No exposure
2006	0	0	0	0	1,698
2007	0	0	0	0	1,502
2008	0	0	0	0	1,693
2009	0	0	0	0	1,558
2010	0	0	0	0	2,882
2011	5	45	70	0	2,384
2012	10	63	91	28	2,253
2013	16	85	111	60	2,128
2014	23	75	92	68	1,489
2015	51	141	178	85	1,388
2016	62	185	223	122	1,254
2017	61	194	228	181	1,333
2018	81	267	307	186	1,162
2019	85	333	392	278	1,055

Measures

BMIz

Participants were asked to report their weight in whole kilograms (without clothes) and their height in centimetres (without shoes). BMI was calculated as weight (kg) divided by height squared (m^2) and converted to age- and sex-specific z-scores using the World Health Organization's reference curves (38). BMI scores below 10 or above 50 were considered biologically impossible and likely resulting from errors in height or weight; therefore, they were coded as missing values.

Physical activity

Physical activity was assessed in children of 12 years and older by the Short QUestionnaire to ASsess Health-enhancing physical activity (SQUASH)(39) in total minutes of moderate to vigorous physical activity (MVPA) per week. The SQUASH includes questions about the average frequency per week and duration per day that participants spend on different commuting, leisure time, and household activities as well as activity at work or school. We followed recommendations for calculations with the SQUASH (40); accordingly, values of more than 105 hours of total activity per week (over 15 hours per day) were considered unrealistic and coded as missing values.

Information was not available on physical activity for children aged 5 to 11 years.

Fruit and vegetable consumption

Since 2014, questions regarding fruit and vegetable consumption have been included. Questions regarding fruit consumption include the number of days per week that children eat fruit and the number of pieces of fruit they eat on those days. For vegetable consumption, children are asked how many days per week they eat vegetables and how many serving spoons they, on average, eat on those days. We calculated whether children adhered to the recommended daily fruit and/or vegetable consumption (0/1) based on the Dutch dietary guidelines for each age group (see (41)).

Covariates

The child's age, sex, migration background, and parental education level were collected via the national health survey. We categorised migration background in line with Statistics Netherlands (42): (1) Dutch — both the child and parents were born in the Netherlands; (2) Western — the child or one of their parents was born in a country in Europe, North America, or Oceania; (3) non-Western — the child or one of their parents was born in a country in South America, Africa, Asia, or Turkey. We categorised the parental education level (available only for children < 12 years old) from the highest educated parent as low, middle, and high, in line with Statistics Netherlands. Additionally, standardised household income was available from the registry data and was categorised by income quartiles for each participant.

Neighbourhood-level demographic data were available from Statistics Netherlands. The percentage of households at or below the minimum household income in the neighbourhood in each survey year was included as an indicator for neighbourhood deprivation.

Analysis

All statistical analyses were conducted using STATA version 16. The statistical significance level was set to $\alpha = 0.05$ in all analyses, and 95% CIs were calculated. In each model, children with missing values on the outcome or any of the covariates were not included in the analyses. See Supplementary file 6.1 for all model formulas.

Effect Estimate I: JOGG exposure and subgroup differences

We investigated the effect of JOGG exposure (i.e. lived in JOGG neighbourhood for at least 18 months) on children's BMI z-score and log-transformed MVPA (logPA) using linear mixed models. Similar analyses were performed for the dichotomous variable of adhering to fruit and/or vegetable consumption guidelines using a generalised logistic mixed model. Stratified analyses were performed by age group (5 to 11 and 12 to 18 years old) because the availability of covariates and reporting method (self- or parent-reported) varied between these age groups. Each model was adjusted for age (in years), sex, migration background, parent education level (available only for the 5- to 11-year-old group), household income, neighbourhood deprivation, and survey year. Additionally, models were adjusted for the interaction of JOGG exposure with age because the effect of JOGG may vary across ages and the chance of being exposed to the JOGG approach for at least 18 months was greater for older children. We included random intercepts in all models to account for clustering of the outcomes by municipality. We excluded participants who were exposed between 1 and 17 months from the analysis ($n = 690$).

Moreover, to study the differential effects of JOGG exposure between subgroups, we alternately included the interaction terms between JOGG exposure and migration background, parent education level, and household income in the adjusted models.

Effect Estimate II: DID

Additionally, we estimated the difference in trends of the average outcome levels over time for the group of participants living in JOGG a neighbourhood ($JOGG=1$) compared to the group of participants living in a non-JOGG neighbourhood ($JOGG=0$). This approach, also known as DID (43), examines JOGG's effects while allowing for structural differences between the JOGG and non-JOGG group, thereby reducing bias from unobserved time-invariant confounders (32,43). In the JOGG approach, such confounders might include the possibility that introducing JOGG reflects the presence of more extensive health policies or a response to higher prevalence of health problems in these neighbourhoods or municipalities.

We employed linear and logistic mixed models with an interaction term for *JOGG* and time (2006-2019) to examine whether introducing the JOGG approach affected time trends in outcome levels for 1) BMI z-scores, 2) logPA and 3) adherence to fruit and/or vegetable consumption guidelines. Participants of all ages (5-18 years) were included in the models and we included random intercepts for municipality to account for clustering of outcomes by municipality.

The core assumption in DID is that time trends of the outcome levels in JOGG and non-JOGG neighbourhoods would have been parallel had JOGG not been introduced (parallel trends assumption). To test this assumption, we examined whether time trends in outcome levels were parallel in the period before JOGG was introduced (2006-2010) by visualising the time trends and by using linear and logistic mixed models with an interaction term for living in a future JOGG neighbourhood and time. Potential biases in DID analysis can stem from changes in the composition of the groups over time (43) and from staggered programme introduction when its effects vary over time (44), which may be expected since time is required for outcomes to change after JOGG is introduced. Therefore, we examined whether covariate distributions between the JOGG and non-JOGG groups remained constant over time (43) (Supplementary file 6.2). Additionally, we conducted stratified analyses for each introduction year, which provide insight into the impact of compositional changes and staggered introductions on the overall effect estimate (44).

RESULTS

Descriptives

Table 6.2 presents the study sample's characteristics according to JOGG exposure. On average, the exposed group had higher BMI z-scores, lower MVPA levels, and slightly more frequent adherence to fruit and/or vegetable consumption guidelines than the non-exposed group. The exposed and non-exposed groups were similar in sex, age, and parental education. As expected, children who were exposed to the JOGG approach more often had a non-Western migration background and

lived in lower income households that were in neighbourhoods with higher deprivation levels. Supplementary file 6.2 includes the distribution of these characteristics between future JOGG and non-JOGG municipalities over time. These demonstrate that the number of children with a non-Western migration background from lower income households was structurally higher in JOGG municipalities even before JOGG was introduced, which indicates that the JOGG approach was more often introduced in neighbourhoods where families have lower income and migration backgrounds.

Table 6.2 Participant characteristics according to JOGG exposure

	Age 5-11 years		Age 12-18 years	
	No JOGG exposure <i>n</i> = 12,321	JOGG exposure > 18 months <i>n</i> = 490	No JOGG exposure <i>n</i> = 11,458	JOGG exposure > 18 months <i>n</i> = 518
BMI z-score				
Mean	-.1	.1	-.1	.0
<i>SD</i>	1.3	1.3	1.1	1.1
<i>N</i> missing	1,710	29	603	12
Minutes of MVPA per week				
Mean	-	-	950	877
<i>SD</i>	-	-	847	839
<i>N</i> missing	-	-	3,712	34
Adherence to fruit and/or vegetable consumption guidelines*	53% (<i>n</i> = 2,087)	56% (<i>n</i> = 246)	31% (<i>n</i> = 1,156)	36% (<i>n</i> = 172)
Sex				
Male	50%	53%	50%	46%
Female	50%	47%	50%	54%
Migration background				
Dutch	79%	57%	79%	58%
Western	7%	7%	7%	9%
Non-Western	14%	37%	14%	33%
Standardised household income				
Unknown	0.7%	-	1%	-
Quartile 1 (lowest)	21%	30%	19%	26%
Quartile 2	25%	25%	22%	26%
Quartile 3	28%	25%	30%	25%
Quartile 4 (highest)	24%	20%	28%	21%
Parental education				
Low	12%	15%	-	-
Middle	33%	32%	-	-
High	42%	45%	-	-
Unknown	14%	9%		
Neighbourhood deprivation: Percentage of minimum income households				
Mean	7.1	10.3	7.0	9.8
<i>SD</i>	4.8	7.3	4.7	7.5

* available only from 2014-2019

Figure 6.2 Descriptive outcome trends (2006-2019) for children in municipalities that never implemented JOGG compared to municipalities that implemented JOGG after 2010

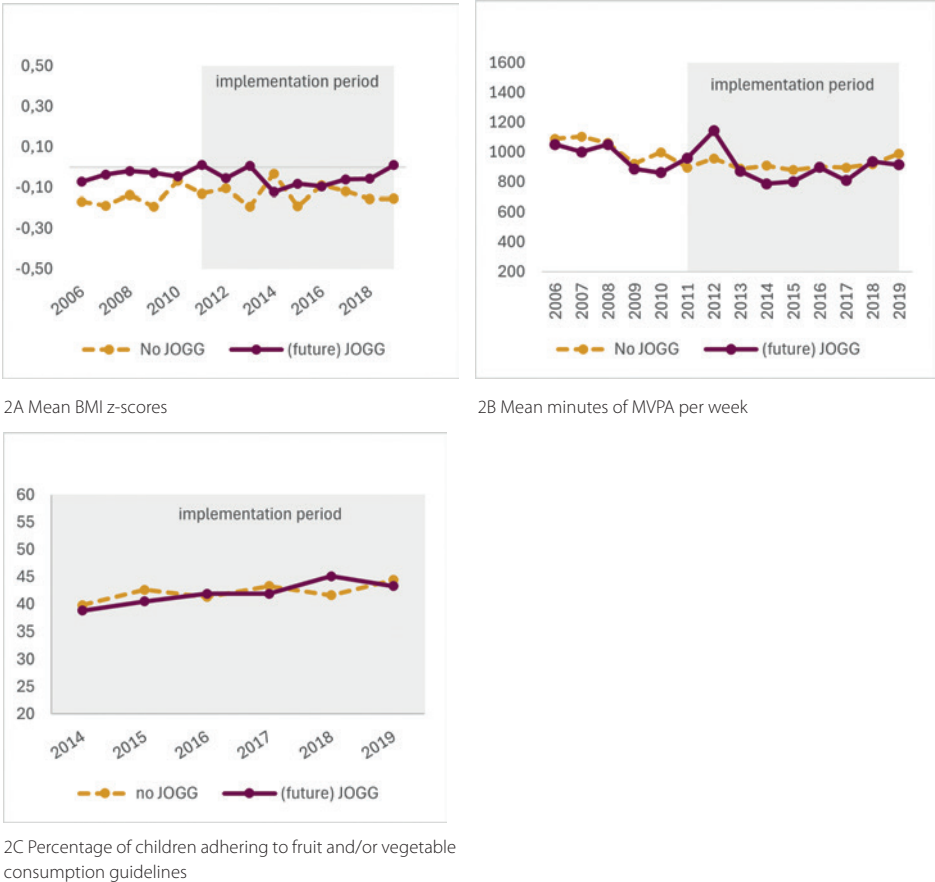


Figure 6.2 illustrates the outcome levels for each survey year according to whether children lived in a municipality that did or did not implement JOGG (in the future). The group of children living in JOGG municipalities had slightly higher BMI z-scores than children in non-JOGG municipalities but similar MVPA levels and adherence to fruit and vegetable consumption guidelines. For both groups, MVPA levels declined slightly over time. Adherence to fruit and vegetable consumption guidelines increased slightly over the years.

Effect Estimate I: JOGG exposure and subgroup differences

Table 6.3 presents the results of the linear mixed-model analysis for the 5- to 11-year-old group. No significant effect of exposure to JOGG was found in BMI z-scores or adherence to fruit and/or vegetable consumption guidelines, and effects did not differ according to migration background, parental education, or household income.

Table 6.4 provides the results for the 12- to 18-year-old group. No significant effects of JOGG exposure or differential effects across subgroups were found on either BMI z-scores or MVPA (logPA). Youth who were exposed to the JOGG approach at the survey time had significantly higher odds of adhering to fruit and/or vegetable consumption guidelines (log odds 1.82, 95% CI [.23, 3.41], $p = 0.03$) when age is zero. The beneficial effect of JOGG exposure decreased with age (log odds JOGG x age $-.12$ per year, 95% CI $[-.22, -.01]$, $p = 0.03$). To facilitate the interpretation of these results we calculated the Risk Difference (RD) between the exposed and non-exposed group, according to age (Supplementary file 6.3). The probability of adhering to fruit and/or vegetable guidelines for 12 year olds was 9.8% higher in the exposed group than in the non-exposed group (RD 0.098, CI [0.01], 0.18, $p=0.03$). This difference in probabilities diminished with age, reaching zero by age of 15.

Table 6.3 Effects of JOGG exposure (>18 months) on BMI z-scores and adherence to fruit and/or vegetable consumption guidelines in 5- to 11-year-old group

	BMIz <i>n</i> = 10,941			Adherence to fruit and/or vegetable consumption guidelines <i>n</i> = 4,305		
	ICC ^A	Estimate (95% CI)	<i>p</i>	ICC ^A	Estimate in log odds ^B (95% CI)	<i>p</i>
0 <i>Random effect of municipality</i>	0.01	-	-	0.03	-	-
1 JOGG exposure	0.00	-.06 (-.60, .47)	.81	0.01	-.58 (-1.50, .34)	0.21
JOGG exposure x age (in years)		.02 (-.04, .08)	.64		.05 (-.05, .16)	.32
2 JOGG exposure x migration background	0.00			0.01		
Dutch (ref)						
Western		-.14 (-.65, .37)	.59		-.54 (-1.38, .30)	.21
Non-Western		-.05 (-.32, .22)	.73		-.21 (-.69, .27)	.39
3 JOGG exposure x parent education level	0.00			0.01		
Low (ref)						
Middle		-.22 (-.61, .17)	.27		-.35 (-1.01, .31)	.29
High		-.07 (-.44, .29)	.69		-.43 (-1.06, .21)	.19
Unknown		.16 (-.41, .74)	.57		-.32 (-1.46, .81)	.58
4 JOGG exposure x household income	0.00			0.01		
Quartile 1 (lowest, ref)						
Quartile 2		.01 (-.33, .35)	.97		.07 (-.52, .65)	.82
Quartile 3		.23 (-.11, .57)	.18		-.17 (-.75, .40)	.55
Quartile 4 (highest)		.17 (-.18, .53)	.34		.08 (-.54, .70)	.81

Models 1-4 were adjusted for age, JOGG exposure x age interaction, sex, migration background, parental education, parental income, neighbourhood deprivation, survey year, and random effect of municipality

*Significant at $\alpha = .05$

^A Intraclass correlation coefficient: indicates the proportion of variability in the outcome that is attributable to municipality

^B Log odds < 0 indicate a negative effect on the outcome; > 0 indicate a positive effect on the outcome

Table 6.4 Effects of JOGG exposure (>18 months) on BMI z-scores, MVPA, and adherence to fruit and/or vegetable consumption guidelines in 12- to 18-year-old group

	BMIz <i>n</i> = 11,233		MVPA (logPA) <i>n</i> = 7,985		Adherence to fruit and/ or vegetable consumption guidelines <i>n</i> = 4,213	
	ICC ^A	Estimate (95% CI)	<i>p</i>	ICC ^A	Estimate (95% CI)	<i>p</i>
0 <i>Random effect of municipality</i>	0.00		0.01			0.02
1 JOGG exposure	0.00	.45 (-.27, 1.18)	.22	0.00	-.09 (-.71, .53)	.78
JOGG exposure x age (in years)		-.03 (-.08, .02)	.22		.00 (-.04, .05)	.83
2 JOGG exposure x migration background	0.00			0.00		
Dutch (ref)						0.01
Western		.35 (-.01, .70)	.06		.11 (-.20, .42)	.50
Non-Western		-.06 (-.27, .15)	.58		-.09 (-.27, .09)	.34
3 JOGG exposure x household income	0.00			0.00		
Quartile 1 (lowest, ref)						0.01
Quartile 2		.11 (-.15, .38)	.41		.06 (-.17, .29)	.62
Quartile 3		.04 (-.23, .30)	.79		.00 (-.23, .22)	1.00
Quartile 4 (highest)		-.07 (-.35, .21)	.61		-.03 (.27, .20)	.78

All models were adjusted for age, JOGG exposure x age interaction, sex, migration background, parental income, neighbourhood deprivation, survey year, and random effect of municipality

*Significant effect at $\alpha = .05$

^A Intraclass correlation coefficient: indicates the proportion of variability in the outcome that is attributable to municipality

^B Log odds < 0 indicate a negative effect on the outcome; > 0 indicate a positive effect on the outcome

Effect Estimate II: DID

There were no significant differences in JOGG neighbourhoods compared to children who lived in a neighbourhood where JOGG was never implemented in BMI z-scores or logPA trends in the pre-implementation period (2006-2010), which supports the parallel trends assumption. Because adherence to fruit and vegetable consumption guidelines has been measured only since 2014, we could not examine outcome trends in the pre-implementation period.

Table 6.5 presents the results of the DID analysis. Outcome trends in BMI z-scores and MVPA levels were not significantly different between children living in JOGG vs non-JOGG neighbourhoods between 2006 and 2019. Time trends for adherence to fruit and/or vegetable consumption guidelines were not significantly different between children living in JOGG or non-JOGG neighbourhoods between 2014 and 2019. Results of the stratified analysis for each JOGG introduction year consistently exhibited no JOGG impact on outcome trends (Supplementary file 6.4). Overall, the results indicated that JOGG implementation did not have a significant effect on BMI z-scores, MVPA levels, or adherence to fruit and/or vegetable consumption guidelines.

Table 6.5 Estimates for the difference in outcome trends between JOGG and non-JOGG municipalities

Outcome	Interaction parameter estimates JOGG x time	
	Beta (95% CI)	p-value
1) BMIz (2006-2019)	-.02 (-.05, .01)	.13
2) MVPA (logPA; 2006-2019)	-.02 (-.01, .05)	.22
	Log odds ^A (95% CI)	p-value
3) Adherence to fruit and/or vegetable consumption guidelines (2014-2019)	.01 (-.06, .08)	.75

All models were adjusted for the random effect of municipality

1) $n = 23,028$, 2) $n = 8,342$, 3) $n = 9,065$

^A Log odds < 0 indicate a negative effect on the outcome; > 0 indicate a positive effect on the outcome

DISCUSSION

Implementing the JOGG approach, a CBOP programme for children and youth in the Netherlands, did not significantly affect children's BMI z-scores or MVPA. We observed that youth 12 to 18 years of age who were exposed to the JOGG approach were slightly more likely to adhere to fruit and/or vegetable consumption guidelines than those who were not exposed. However, this effect decreased with age and this finding could not be confirmed by comparing average outcome levels over time among children living in JOGG municipalities to children in non-JOGG municipalities. We found no evidence for the differential effects of JOGG exposure across subgroups defined by SEP and migration background. Therefore, the JOGG approach appears not to widen or reduce inequalities in BMI or health behaviours.

Our findings are inconsistent with those of previous studies on CBOP programmes that were not scaled up, which predominantly suggest that these programmes can reduce overweight

prevalence (13–15). This inconsistency may be due to differences in each municipality's JOGG implementation. Programmes that were previously effective entailed a controlled, strategic, and intense combination of interventions and policy changes within one or a few communities (e.g., (45,46)). The JOGG approach, however, is implemented by local municipality teams that vary significantly in, for example, resources and local stakeholder attitudes towards the programme. Consequently, implementation differs widely (35,47), with some forms being more intense or effective than others.

Moreover, isolating JOGG effects from the broader context, especially from other policy measures within municipal health promotion (20), is nearly impossible. Most municipalities in the Netherlands implement some programmes that promote physical activity(48) regardless of their JOGG status. Consequently, the contrast between JOGG and non-JOGG municipalities regarding physical activity promotion may be minimal, thereby potentially explaining the lack of a JOGG effect on MVPA. However, fruit and vegetable consumption is not typically addressed in municipal or school policies (49). This issue may receive more attention in JOGG municipalities, which could account for the observed small contribution of JOGG to fruit and vegetable consumption.

Previous researchers have argued that a solid process evaluation could consider differences in implementation and context (50,51). However, selecting clear-cut indicators of successful implementation is difficult due to the complexity of the causal pathway from the implementation of a CBOP programme to health outcomes (24,50) because the programme's components interact with the context and each other (52), thus complicating the attribution of effects solely to JOGG. Additionally, the combinations of components that lead to success may vary between contexts (20,52). Therefore, we recommend further studies on the intermediate outcomes (e.g., policies and practices) (50,52) and the mechanisms through which the programme contributes to these outcomes (24,52). This may improve understanding of why and in what context the programme is effective (22,24) while also strengthening causal inferences (50).

We should note that it may be unrealistic for CBOP programmes alone to reduce the prevalence of overweight in the long term, because of the complex system of multiple factors that drive this problem (3–5). JOGG focusses on sustainable changes that are systematically embedded into an organisation's attitude, knowledge, and policies and solidified in infrastructure (e.g., playgrounds) (24). There is evidence that such measures contribute to health outcomes (2) and are sustainable in the long term (53); however, such changes alone are insufficient to reduce the prevalence of overweight, as prevention eventually requires broad and sustainable system change that is driven by community-based action as well as top-down national policy action from public and private sectors (54).

Strengths and limitations

A strength of this study is the application of two effect estimates. Estimations of 1) the effects of exposure and 2) the difference in time trends between JOGG and non-JOGG municipalities rely on different assumptions and effect definitions; consequently, limitations in either one can

be addressed by the advantages of the other (32,34). By applying Estimate 1, we controlled for several observed confounders and examined subgroup differences. However, structural differences between JOGG and non-JOGG groups may have caused bias. Examining the difference in time trends (Estimate 2) allowed for structural differences between the groups, thereby reducing bias from unobserved time-invariant confounders. In both analyses, we considered municipality-level clustering to avoid bias due to municipal differences (31) but neighbourhood-level bias may remain.

Nevertheless, there may still be remaining sources of bias. Neither of the two methods employed could adjust for unobserved confounders that differentially affected the exposed and unexposed groups and outcomes over time (32,43); furthermore, the small sample size prevented our ability to account for neighbourhood-level clustering. Adherence to fruit and/or vegetable consumption guidelines was available only from 2014 onwards, so we could not examine outcome trends before JOGG implementation. Consequently, it remains unclear whether JOGG's small positive effect on adherence to fruit and/or vegetable consumption guidelines in the first analysis might have been biased by differences between the JOGG and non-JOGG groups before JOGG implementation.

Moreover, there are some limitations to the data. We used data only until 2019, although many more municipalities introduced JOGG after this time. The study sample may have been insufficient to detect results since effect sizes of CBOP programmes are usually small (8). Additionally, height and weight was self- or parent-reported and may have suffered from social desirability (50). Finally, data were not available on other possible relevant outcomes, such as the consumption of water and sugar-sweetened beverages.

Despite these limitations, the current approach is valuable in evaluating the JOGG approach. A Randomized Controlled Trial is often suggested as the gold standard for evaluating health interventions; however, the core limitation of this approach is that the randomisation that is used to reduce bias is often not possible when studying long-term outcomes and can result in evidence that no longer reflects the reality of practice (33). Considering the conditions in which the programme is implemented, including local policies and differences in implementation, provides a more realistic understanding of the programme's contribution in a population than a controlled setting (21,33) and may therefore be more informative for policymakers.

CONCLUSION

We studied the contribution of a national CBOP programme to children BMIz scores, MVPA and fruit and vegetable consumption between 2010 and 2019. Although, no significant differences in BMI z-scores or MVPA levels were found, in 12-18 year olds the probability of adhering to fruit and/or vegetable guidelines was higher in the group that had been exposed to the JOGG approach than in the non-exposed group. Examination of the implementation process and intermediate outcomes using both quantitative and qualitative methods is needed to unravel the working mechanisms and effectiveness of CBOP programmes after scale-up.

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Chapter 7

General discussion

The aim of the research presented in this thesis was to gain insight into the implementation, working mechanisms, outcomes and impact of a widely implemented community-based health promotion programme in the Netherlands: the JOGG approach. Thereby we aimed to inform further development of the JOGG approach and community-based programmes in general. To consider the complex nature of the implementation process and gain a broad understanding of how the programme works in practice, we adopted a holistic evaluation approach. We applied various perspectives and methods to evaluate change processes across JOGG communities, including emerging outcomes, the influence of context, the causal pathways and mechanisms through which the programme works.

In this final chapter, we reflect on the impact, outcomes and working mechanisms of the JOGG approach by synthesising findings from the different studies presented in this thesis. In addition, we share lessons learned on evaluating community-based health promotion programmes and discuss potential challenges related to the generalisation of study results and implementation. Moreover, we discuss the broader implications of the findings from this thesis for community-based programmes and suggest future directions for research and practice.

SUMMARY OF MAIN FINDINGS

Given that there was limited guidance on how to take a holistic approach to the evaluation of community-based health promotion programmes at the onset of our study, we developed and presented a research framework that fit our needs, presented in **Chapter 2**. This framework considers the implementation of a community-based programme as a complex adaptive process and highlights different aspects of this process that can be evaluated. These aspects include (1) the programme theory, (2) the adaptation of the programme theory to the local context and available resources, (3) the implementation process, (4) the ongoing adaptation of the programme theory and implementation strategy over time, (5) the programme interaction with the context and feedback loops, (6) outcomes (intended, emergent and unintended outcomes) and (7) principles for effectiveness (how the programme contributes to identified outcomes). To address the research questions associated with each of these aspects (Table 2.1), we proposed a multiple case study design with various research methods.

In **Chapter 3**, we focused on the context-dependent and dynamic implementation process of the JOGG approach. We examined this process in nine communities that had implemented JOGG for five to 10 years using document analysis and interviews as our primary research methods. We also used an analytical tool called the critical event card to identify key events in the implementation process. Our findings revealed that in general the communities underwent six phases of change during the implementation of JOGG: preparation, initiation of JOGG, upscaling, resource mobilisation, integration with other policy initiatives and adaptation of the implementation strategy. Key events that influenced the implementation process, which are detailed in Table 3.2 (Chapter 3), included national policy developments (e.g. new health programmes), the framing of

the JOGG approach in local policies, staff turnover and the local implementation teams' experiences and actions. Furthermore, changes in implementation were often triggered by the destabilisation of the implementation process and linked to opportunities for change in the policy process.

Given the importance of the implementation team in the local JOGG approach, the study presented in **Chapter 4** focused on the local JOGG coordinator's role in the programme and necessary skills. We conducted interviews with 12 local coordinators and focus groups with advisors from the national JOGG organisation ($n = 8$). The results showed that JOGG coordinators assumed a variety of roles, which evolved over time. Initially, coordinators assumed roles as implementers, project managers, networkers and matchmakers to engage stakeholders and facilitate collaboration. As implementation progressed, they became linchpins within the network, politicians and programme managers to mobilise the network of stakeholders. These roles all required different competencies and varied according to several factors in the organisational context, including available resources, the position of the employing organisation in existing local stakeholder networks, the coordinators' responsibilities within their employing organisation and their professional background. Thus, the findings highlighted the essential role of coordinators in the implementation process. To achieve successful implementation, it is crucial to allocate sufficient resources to employ a skilled coordinator and to carefully select the organisation where they are employed.

We presented our evaluation of the outcomes and working mechanisms of the JOGG approach in **Chapter 5**. As part of five case studies, we conducted ripple effects mapping sessions and interviews with local stakeholders ($n = 50$) to assess the outcomes and impact of the JOGG approach in their communities. After five to nine years of implementation, participants perceived that JOGG had enhanced local stakeholders' ownership of child health promotion, health policies, intersectoral collaboration and social norms around promoting healthy lifestyles. Small initial outcomes created the preconditions that enabled the achievement of long-term impact. We identified five key working mechanisms of JOGG: (1) creating a positive connotation with JOGG; (2) mobilising stakeholders to participate in the JOGG approach; (3) facilitating projects to promote knowledge and awareness among stakeholders while creating successful experiences with promoting healthy lifestyles; (4) connecting stakeholders, thereby stimulating intersectoral collaboration; and (5) sharing stakeholders' successes in promoting healthy lifestyles, gradually establishing a social norm of participation. The specific actions taken to activate these working mechanisms greatly varied across communities (see overview in Table 5.3).

In **Chapter 6**, we presented the results from an evaluation of the programme's contributions to intended individual health outcomes. Using repeated cross-sectional data from the Dutch national health survey (2006–2019), we first applied linear mixed models to assess the association between exposure to the JOGG approach and BMIz, physical activity and adherence to fruit and/or vegetable guidelines. Second, we compared outcomes trends between children who live in JOGG and non-JOGG municipalities using a difference-in-difference approach. The results showed that JOGG potentially contributed to higher fruit and vegetable consumption among youth but showed no association between JOGG exposure and children and youth's weight status or physical activity

levels. Associations did not differ across subgroups defined by socioeconomic position (SEP), or migration background

REFLECTIONS ON MAIN FINDINGS

In this section, we reflect on the main findings related to the JOGG approach by drawing on conclusions from the different studies presented in this thesis.

Outcomes and impact: The community

The JOGG approach initially focused on creating a community environment that promotes healthy dietary behaviours and physical activity among children and youth. The findings presented in this thesis show that the JOGG approach contributed to community-level changes. Initially, these included short-term actions (e.g. water drinking project) and stakeholder engagement in the JOGG approach. With reinforcement from local JOGG implementers, these outcomes gradually evolved into long-term community impact, including increased ownership for promoting healthy lifestyles, enhanced intersectoral collaboration and changes in policy towards health promotion.

Moreover, the JOGG approach appeared to contribute to structural community-level changes, which is considered essential for initiating systems change related to overweight from the bottom up (1–5). As McLeroy et al. (6) and Hawe et al. (7) described, the value of community-based programmes does not lie in the number of actions or elements that are implemented but in the meaningful changes that they foster within the community, such as changes in social networks, organisations, established practices, public policies and even beliefs and paradigms. By generating such changes in community structure, the programme contributes to systemic and sustainable change and ensures that changes in the community that promote health became embedded rather than fade away over time (7–10).

Outcomes and impact: Individual health outcomes

The JOGG approach was initially introduced into policy in the Netherlands to stop the rising trend in childhood overweight. However, the findings in Chapter 6 showed that this goal was not achieved; we found no evidence that the JOGG approach affected either trends in BMIz or health behaviours among children or youth. Although JOGG may have contributed to higher fruit and vegetable consumption among youth. Findings from the other chapters in this thesis offer insights on why JOGG may not have established measurable individual health outcomes.

First, community-level changes were often limited to specific stakeholders. The changes in policies and ownership described in Chapter 5 were mostly visible in stakeholders from sectors with a goal to achieve child health and wellbeing, such as schools, child care and youth work. Stakeholders from other sectors that impacted children's health, such as supermarkets, restaurants and policy sectors beyond health, were either not involved in the JOGG approach or unwilling or unable to make changes within their own organisations. For example, in one community, JOGG implementers

tried to prevent plans for the construction of a new fast food restaurant near a school. However, they were not successful in involving the responsible municipal stakeholders, as the latter did not recognise child health as their responsibility and prioritised the plan's direct economic benefits. Challenges in involving stakeholders beyond the health sector in public health promotion is a well-known barrier in these programmes (11–14), which results (among other factors) from a mismatch between programme goals and the primary stakeholder's interests and priorities (5,15).

Second, the changes that JOGG aimed to achieve in local environmental determinants of obesity were constrained by the broader systems in which they were embedded. Community stakeholders described that their potential to make changes within their own organisations was limited by the guidelines and structures imposed by their funders or national brands. For example, supermarkets reported that, while they were able to sponsor events by providing fruit and water, they were not allowed to make more structural changes in, for example, the shelving and pricing of their products. Moreover, policymakers often reported being restricted by financial structures and working processes in their local government sector. Consequently, making meaningful, sustainable changes in the community system proved to be a slow and challenging process.

Third, community-level changes may not be extensive enough to produce individual health outcomes. Previously studied programmes that have been deemed effective at improving health outcomes (16–18) are often community-based programmes that focus on implementing many interventions and actions within a specific geographic area. By contrast, the number of actions and interventions was lower in the JOGG approach. This is because JOGG focuses on implementing higher-level changes in the community system, such as in organisational policies. While such changes may take longer to achieve and may not have an immediate impact on health behaviours, they are more sustainable and impactful in the long run.

Lastly, the scope of the JOGG approach is potentially too narrow to make a significant impact on childhood overweight. It is well-known that overweight is the result of a complex system of interconnected factors and sub-systems (19), which range from individual psychological and biological factors to broader social, cultural and physical environmental factors, as well as the food production and public transportation systems that interact with them. All of these factors, along with related stakeholders and systems, must be considered when addressing the complex problem of obesity. The scope of JOGG, which focuses on the community level and health, may not be broad enough to affect overweight levels. Other levels and factors in complex system that drives overweight, such as poverty, stress, wellbeing or the food industry, may still limit the impact of a community-based programme on overweight.

Community-based programmes' contribution to wicked problems

Community-based health promotion programmes such as JOGG are often expected to deliver measurable individual health outcomes (20). Policymakers typically evaluate the effectiveness of such programmes by determining whether these goals have been met, which then informs their decisions about future funding and continuation. Solely based on the results of individual health

outcomes, policymakers may conclude that the JOGG approach is ineffective and that further investment in the programme is not justified. However, the absence of individual health effects does not mean that the programme is not valuable in contributing to health promotion.

Community-based programmes that address the wider determinants of health and community-level structures, such as JOGG, are likely to achieve sustainable changes to the community system (3,6). However, they must be combined with other actions to maximise their impact on health outcomes (5). Effectively addressing the systemic factors that sustain obesity requires a diverse range of strategies from the bottom up, at the community level, and the top down (e.g. the national and international policy level). For example, Swinburn et al. (5) recommended combining the mobilisation of community level action with the strengthening of national and international policy levers to create sustainable and health-promoting business models and reduce the influence of large commercial interests on public policy development. This suggests that JOGG, while effective at mobilizing local community action, must be supplemented by national and international action to effectively address childhood obesity.

Challenges in evaluating the JOGG approach have also been referred to as the 'evaluation paradox' of wicked problems (21). On the one hand, wicked problems lack definitive solutions and are resistant to change. Childhood overweight cannot be 'solved' using a single community-level programme. On the other hand, policymakers are required to evaluate the effectiveness of implemented policies and programmes based on whether they solved the problem. This paradox can discourage further investments to address the problem or lead to an overestimation of the potential of a single intervention. Consequently, many programmes implemented in public health are interventions that target individual behaviour, such as through education and campaigns, rather than changing the system that maintains the unhealthy behaviours (22). However, such interventions are unsustainable (8,9,23) and unlikely to be effective for population-level prevention (24).

This suggests that policymakers require a different approach for evaluating programmes that target wicked (health) problems (21,25). Rather than making decisions about the programme based solely on their impossible potential to fully solve the wicked problem, these should be based on their potential contributions to addressing the wicked problem as part of an integral strategy. Therefore, the JOGG approach should be evaluated based on its contributions to the strategy for preventing childhood overweight – such as the sustainable community-level changes achieved – rather than its effectiveness in halting or reversing the increasing trend of childhood overweight. Accordingly, we propose alternative directions for evaluating community-based health promotion programmes below.

METHODOLOGICAL REFLECTIONS

In this section, we reflect on the strengths and limitations of the applied research framework that was presented in Chapter 2 and the participation of stakeholders throughout the evaluation. In addition, we discuss potential challenges related to the generalisation of the study results and programme implementation.

Application of the research framework

A strength of the applied framework presented in Chapter 2 is that it facilitated the incorporation of a complexity perspective into the evaluation of JOGG. Within the framework, the JOGG approach was positioned as an adaptive programme that evolves over time and produces outcomes through interactions with the local context. This was crucial in considering the diverse aspects of community-based health promotion and emergent outcomes throughout the data collection, analysis and interpretation of the results. For example, the methods that we applied were grounded in the idea that the programme and local context continuously interacted with each other and changed. Specifically, the critical event card (26) provided valuable insights on the adaptive implementation process, while ripple effects mapping (27,28) helped us to gain insight into the emergent outcomes of JOGG and the causal processes through which initial outcomes led to long-term impact. Overall, incorporating the complexity perspective enabled us to gain an in-depth understanding of the programme's impact and the small steps involved in the process of changing the community system. For instance, we discovered the significant role of small successes in changing the community system. Whether they consisted of a successful water campaign at daycare centres, a cycling-to-school project or a supermarket safari event for children, these small successes all served the same purpose: when shared and celebrated (e.g. through newsletters, social media and events), they facilitated a positive culture of health promotion and stimulated commitment and ownership to promote healthy lifestyles. We would not have gained insight into this process if we solely focused on predetermined indicators.

Another strength is that the research framework facilitated the translation of findings for local programme implementers and national programme planners and decision makers, thereby directly supporting further programme development. The direct feedback about outcomes, successes and local context to local programme implementers guided them in the further process of adapting and implementing the programme. Additionally, results from local initiatives enriched the practice-based knowledge base, based on which the national JOGG organisation informed the overall programme theory and offered direction for effectively supporting local JOGG communities in the implementation process.

Although the application of the research framework provided valuable insights, an important limitation is that it was extremely time-intensive to study the many components of the community-based health promotion process specified in it, including implementation, interaction with context, adaptation, outcomes and working mechanisms. Thus, considerable research resources were needed to gain insight into all of these aspects of the programme. For future applications of the

framework, we recommend prioritising the relevance of the information for end users (e.g. decision makers or programme planners) and selecting the research questions and methods accordingly.

Another limitation of the research framework used in this thesis is that it was retrospectively applied. Although this enabled us to study implementation over the long term, the retrospective nature of the studies implied several threats to the validity of our research results (29), such as recall bias and selection bias. For example, communities that declined participation may have had different and more negative experiences with the JOGG approach than participating communities. We attempted to mitigate bias by combining different data sources and triangulating data from interviews and documentation. However, some bias remained. Ideally, developments would be followed over time(27). This would provide more detailed insights on which aspects of the process and the programme contributed to outcomes and which did not.

Local stakeholders' participation in the evaluation

A strength of our approach is that we incorporated the perspectives of various local stakeholders in the evaluation. This is crucial in evaluating community-based programmes since these stakeholders are the primary drivers of changes in the community system (30,31). Therefore, their experiences, perspectives and responses are essential for (a) understanding progress in community change, (b) gaining insight into the emergent outcomes and spin-off effects of the programme and (c) learning about the underlying processes through which these changes occur.

Taking into account the perspectives of a diverse group of stakeholders was valuable. From programme implementers, we gained insight into the adaptive implementation process and direct outcomes of their work. From stakeholders targeted by the programme we gained additional insight into the contributions of JOGG in changing the community system, emergent outcomes and spin-off effects. Their perspectives also provided greater insight into the role of other elements or structures in the community in relation to health promotion.

However, it should be noted that not all relevant stakeholders were involved in the study. When studying the entire process of community change, it is important to capture all perspectives (30). This is because each stakeholder has their own place in the community system. In addition, different stakeholders and actors at one stakeholder organisation (e.g. leaders, professionals and clients) may have very different perspectives on JOGG and health promotion. In the studies presented in this thesis, we only captured the perspectives of implementers and representatives from the formal organisations targeted by the JOGG approach. We did not capture the perspectives of different actors at each stakeholder organisation or children or parents, and we did not include organisations that did not participate in JOGG, despite the fact that they may be important stakeholders.

Generalisability of study results

In this thesis, we conducted case studies in several JOGG communities (Chapter 3 and 5) and considered each community as a unique context. A common critique when evaluating public health programmes from this perspective is whether and to what extent results of these evaluations

are 'generalisable' (32). If everything is complex and each context is unique, what could be generalised from one instance to another?

It is important to note that generalisations from case studies are different from empirical generalisations. Whereas empirical generalisations aim to identify regularities about what works across all existing contexts, the value of case studies lies in describing and accounting for what happens and emerges within a specific context (33). Case studies lead to greater insights on 'how' and 'why' a programme works (29). Generalisations from case studies are the theories about the function of the programme, the processes and changes that they aim to evoke. Instead of universal claims about what works, these generalisations describe principles, patterns or lessons learned from a case that may potentially apply to a variety of situations (29,33).

The comparative case study approach (29,34) allowed us to elevate the in-depth information gathered from each local context to a higher level of abstraction, thereby developing generalisable theories about how the JOGG approach functions and the underlying processes of community change across different contexts. We identified working mechanisms (Chapter 5) or effective principles that can provide guidance for action that is adapted to the context (33). For example, we identified 'sharing successes' as a key working mechanism of JOGG. Its main function is to make health promotion actions visible to other stakeholders to encourage them to implement actions themselves. The ways in which these successes were shared differed across communities, according to what suited the programme implementers and stakeholders. However, their function in the process of community change was similar.

Implementation: Fidelity versus adaptation

It is often stated that process evaluation is crucial for determining whether a programme was successfully implemented and interpreting effect evaluations (35,36). Traditionally, this entails evaluating whether programme elements were delivered as intended and studying the programme's reach and dose (37–39). This notion of implementation fidelity strongly contradicts the notion of adaptation from the complexity perspective (40). In the latter, each community is considered a complex environment where people and relationships interact with programme efforts, which requires continuous programme adaptation in response to initial outcomes, challenges, opportunities and needs within the community.

Although the implementation process of a programme is context-dependent, it is important to provide some guidance on how it is intended to work (30). Otherwise, there is a risk that the programme becomes unfocused (45). We observed this phenomenon in the case studies (Chapter 3). Across communities, perspectives on what the JOGG approach entailed greatly varied. In the national JOGG programme theory, community capacity building is specified as an important element (41). However, the programme theory provides very little guidance on how community capacity should be built. Consequently, some JOGG communities considered the JOGG approach to be a programme with activities and campaigns that target individuals, while others perceived it

as a way to collaborate with stakeholders. How JOGG was perceived had an immense and persistent influence on how it was implemented over the years.

Several authors have proposed a solution to this apparent contradiction between fidelity and adaptability: meeting in the middle (33,40). In line with the notion about the generalisability of programme functions described in the previous paragraph, during the implementation of community-based health promotion programmes, the function of programme elements in the process of changing the community system is more important than their precise form (32,39,42). Thus, successful implementation does not entail implementing exactly the same programme elements in each community. The programme's precise form may be different in every community and tailored to the local context. However, its functions should be understood and maintained during its implementation (39,42).

RECOMMENDATIONS FOR EVALUATING COMMUNITY-BASED HEALTH PROMOTION PROGRAMMES

At the beginning of this thesis, we stated that adequate evaluation of community-based initiatives' contributions to wicked health problems requires a holistic approach. Based on findings from the studies presented in this thesis, we identified several directions for the evaluation of community-based health promotion programmes for researchers and policymakers.

First, we recommend combining different types of research methods to gain a broad view of the programme's impact. The evaluation of standardised indicators is useful for evaluating whether intended changes in the community, such as water drinking policies in schools or the number of healthy sport canteens, were achieved. Specifically, indicators for the development of community capacity (43,44) and health promotion policies, practices and environments (45) may be useful in monitoring progress in the process of changing the community system. Additionally, it is important to gain insight into emergent and unintended outcomes. Recent developments in qualitative methods may be useful to this end. For example, ripple effects mapping (27) may be used to assess the programme's emergent outcomes, spin-off effects and its contributions to these outcomes.

Second, because community change may start with small steps and takes a long time to unfold, proximal and intermediate outcomes are useful for determining whether intervention efforts are contributing to sustainable community changes. Several models have been developed to identify indicators of successful implementation and progress in community-based programmes. For instance, the *small wins framework* developed by Termeer and Dewulf (21) focuses on identifying small wins and analysing whether they activate the right propelling mechanisms that can potentially accumulate into larger transformative changes. In addition, the *action scales model* developed by Nobles and colleagues (25) is a conceptual tool that can facilitate the identification and appraisal of actions and their potential to coherently contribute to systems change. In the

context of the JOGG approach, the identified working mechanisms (Chapter 5) can serve as indicators of successful implementation.

Third, continued monitoring and evaluation at the community level should be integrated into standard programme implementation. Monitoring and evaluation can assist local programme implementers to continuously adapt the programme to the dynamic local context and thereby strengthen it (30) and support programme evaluation at the national level. Progress within the local programme can be monitored using a combination of standardised indicators for community change and qualitative methods to gain insight into its emergent and unintended outcomes.

Lastly, individual health outcomes can still be monitored, but these outcomes should be treated as part of the bigger picture (46). To interpret data on individual health outcomes, we recommend triangulating findings on individual health outcomes with indicators of implementation and community change. Rather than dismissing a programme based on individual health data, decision makers can use these data to determine potential improvements, next steps and best practices. For example, monitoring trends in health behaviours and obesity levels can help policymakers to identify areas that require further action and explore the factors and processes at play in these areas.

FUTURE RESEARCH: ACCUMULATING EVIDENCE ON COMMUNITY-BASED HEALTH PROMOTION

By accumulating evidence from multiple studies and integrating results from various research methods, we can gradually build a stronger evidence base for community-based health promotion (32,35,47). In the studies presented in the current thesis, we followed a practice-based evidence pathway (30,48) in which we examined the development and implementation of a programme in real-world settings. The insights derived from these studies contributed to building theory on community change and potential working mechanisms in community-based programmes. This is important because the literature currently offers limited knowledge about the processes underlying community-based health promotion.

Future research could further strengthen the evidence base for community-based health promotion in several ways. First, it can validate current theories on changing the community system, such as the working mechanisms identified in the current thesis (32,33). Qualitative studies can help further unpack the proposed mechanisms and events, while quantitative studies can validate results across contexts by, for example, systematically monitoring the implementation of key mechanisms and potential policy changes in a larger number of communities.

Second, alternative complexity-sensitive methods can be applied to obtain new insights on different parts of the complex process of community change (49,50). For example, social network analysis could be applied to gain insight into how the network of community stakeholders can evolve as a result of a programme (7,49). Group model building and systems mapping can contribute to a

better understanding of the local community structure and system in relation to the health issue (49) and the dynamic interactions between programme efforts and changes in the local system over time (51). Furthermore, agent-based modelling could be applied to better understand how stakeholders' knowledge and engagement in health promotion diffuse over time (50).

Lastly, using theories commonly applied in the social sciences may be helpful for improving our understanding of the various processes of community change. For example, political science theories or theories on the policy process may be employed to better understand how policy changes in local or national government occur (52).

RECOMMENDATIONS FOR COMMUNITY-BASED PROGRAMMES

Overall, the findings from Chapters 3–5 in this thesis contribute to a more detailed understanding of evidence-based practices for community-based programmes identified in previous studies, such as building intersectoral collaboration (53–55), raising awareness and ownership of the problem (12,53,54,56) and context sensitivity (12,57). Additionally, we highlight more general directions for community-based programmes below.

Ownership as key objective in community-based health promotion

Previous studies have emphasised the importance of raising awareness and fostering ownership of the programme and its goals among stakeholders (12,53,54,56) to stimulate action. In many of these studies, ownership was presented as a facilitator of programme implementation (12,53,58,59) – something that is present or not present – rather than an objective of such programmes.

Based on the research findings presented in this thesis, we conclude that creating ownership should be a primary objective in community-based health promotion programmes. It is only when stakeholders experience true ownership of the problem – when they feel responsible for children's health – that health promotion can become embedded into an organisation's policies and regular working processes. Therefore, ownership becomes the vehicle for sustaining health promotion within the community (8). Conversely, treating ownership merely as a facilitator may diminish its importance and overlook the crucial role that community-based programmes can play in fostering it.

Achieving ownership requires significant attention in the programme theories, support structure and implementation of community-based programmes. This is because fostering ownership is a complex, time-consuming process that should not be underestimated. It often involves a long period of small steps, from first creating awareness and knowledge to participation and eventual ownership. For some stakeholders, it may take years of multiple campaigns, activities and success experiences to establish true, sustainable ownership of health promotion.

The importance of the implementation team for success

Previous studies have identified sufficient financial resources as a key facilitator of successful programme implementation (12,53,54). The findings from the studies presented in this thesis highlight that investing in human resources is equally important. Local programme implementers play a critical role in adapting the programme to the community context by continuously making decisions on the steps that must be taken to build community capacity and engaging, linking and mobilising various stakeholders. In this central position, implementers can make or break the programme's success.

Our studies revealed several ways of supporting human resources. First, having a structure in place for training and advising local programme implementers can be beneficial since it is well-known that their skills are an important facilitator of programme implementation (12,53). This structure should be aimed at the wide range of skills that programme implementers require. As described in Chapter 4, such skills range from operational and networking skills to initially engage stakeholders to strategic skills for mobilising stakeholders at different levels.

In addition to training and support, financially investing in local human resources is essential. As earlier studies have noted (12,60), local resources are often insufficient for hiring a programme implementer who possesses the wide array of competencies (skills and characteristics) required. Given the local programme coordinator's central role in programme implementation, one of the main ways to ensure successful implementation is to hire coordinators that possess the competencies needed for building community capacity, such as sensitivity to the needs and interests of stakeholders, strategic thinking, vision and an entrepreneurial mindset. Moreover, the 'soft-infrastructure' of resources for community programmes, such as trust and (funding) stability, is important (61).

Finally, providing local implementers with a programme theory on building community capacity is crucial. A programme theory clarifies how the programme contributes to changing the community system and encourages local implementers to understand and maintain the programme's functions during the implementation process. In addition, a programme theory encourages a focus on sustainable, long-term community change rather than short-term successes. Thereby, a clear programme theory can guide implementers in effectively implementing the programme to achieve sustainable impact.

Employing a systems perspective

A common pitfall of programmes that target community systems in relation to wicked problems is a focus on relatively easy, low-hanging fruit, which fails to address the root causes of the problem (21,25). For example, solely engaging stakeholders who are enthusiastic about the programme may have a limited impact. Over time, all relevant stakeholders within the system should be involved. Another example is a focus on quick wins, such as a water drinking project at a school. While quick wins may be leveraged to drive further changes in the community, they alone are insufficient to achieve sustainable changes in the community system.

It is important to eventually address deeper, more sustainable layers of the community system (25), such as the underlying goals, structures, and assumptions of key stakeholders about health promotion. To support this, we recommend adopting a systems perspective to implement community-based programmes. There are several ways in which a systems perspective may be useful. First, systems thinking tools can assist implementers in planning community-based programmes by providing better insight into the existing community system (49,62). For example, causal loop diagrams can be used to visualise existing community structures and processes, stakeholders and policies, as well as how these interact to create health outcomes. These insights may assist with understanding the underlying causes of the health problem and identifying the most effective points of intervention in the community system. Second, a systems perspective may assist implementers in thinking about how different programme efforts can mutually reinforce each other and how feedback loops can be applied to strengthen the process. Third, a systems perspective encourages consideration of how the local system is related to macro-level structures and what is needed at the macro level to support the local level and effectively address the health problem. Community-based programmes can play a role in flagging community structures that are limited or driven by macrostructures, such as national policies or cultural norms and values that limit local action.

Despite its potential, it should be noted that the using systems thinking in policy making and practice remains a challenge (63) due to unfamiliarity with its concepts and value; a lack of expertise, confidence and time; and the absence of practical tools. Thus, progress in this area is still needed, such as developing practical guidance and tools to support practitioners and policymakers to employ systems thinking. Accordingly, collaboration with researchers and experts in the field of systems is recommended to integrate a systems perspective into community-based programmes.

CONCLUSION

In this thesis, we adopted a holistic approach to evaluate a widely implemented community-based health promotion programme in the Netherlands: the JOGG approach. In the process, we accounted for the complex and adaptive nature of the programme, which enabled us to capture a wider range of outcomes and impacts rather than solely focussing on individual health outcomes. Considering a different notion of generalisability and fidelity allowed us to identify working mechanisms that are applicable across contexts.

While we found no evidence for the contribution of the JOGG approach to individual health outcomes, the programme was successful in contributing to sustainable community changes that support health promotion. This demonstrates that community-based programmes have the potential to address the system that drives childhood overweight from the bottom up. Thus, when evaluating community-based programmes, it is crucial to assess their contributions to a wider strategy for health promotion – such as shifts in ownership and policy changes towards health promotion among community stakeholders – rather than solely focusing on individual health outcomes.

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Chapter 8

Supplemental files per chapter

S3.1 PROTOCOL TIMELINE INTERVIEWS

July 2021

Preparation

1. Draft timeline (on paper or online in Miro), include years on the timeline
2. Prepare additional questions that came up while drafting the timeline
3. Signed informed consent form in preparation in the interview

Interview

Welcome and introduction (15 minutes)

- Introduction of the researcher
- Explain the goal of the interview: the goal of this interview is to gain insight into how the JOGG approach has been implemented over the years in your community and to understand how it has been developed to the JOGG approach that it is now. I would like to know what key moments were over the years, what the most important changes were in your implementation and implementation strategies, how these changes happened and what circumstances contributed to these changes.
- Introduction of participants
- Questions or comments in advance?
- Check signed consent form
- Start audio recording
- Explain Miro: during the interview we are going to use a visual timeline. Based on the documents that you sent me I have already added some important dates and moments on this timeline. We are going to go through this timeline. I would like to know the whole story around what I have written down so far. We are also going to add to this timeline. There are no right or wrong answers.
- Share link to Miro board and check if participants can see the timeline
- *Topics (70 min)*

The start of JOGG

- Can you tell me something about the start of JOGG in this community?
 - Why did the municipality decide to start JOGG?
 - How did you get involved?
 - Was there an action plan? How was that developed?
 - How did you implement the approach at the start?
 - How was the staff and other resources organised?

Now I would like to get into how the JOGG-approach was implemented and developed over the years since the start.

Adaptions and development: Can you tell me something about how the JOGG approach changed in this community since the start?

- What are you doing differently?
- What were the most important changes in implementation since then?

Key events on the timeline: let's look at the timeline. I would like to further discuss the changes that we just identified and place these on the timeline. By doing this we will get a good overview of everything that happened over the years. We can also add key events over the years while doing this.

- Looking at the timeline: is it complete? Do you think something is missing?
- Given the changes that we just discussed, what should we add to the timeline?
- Are there any other key events in the implementation of the JOGG approach?
 - What were important successes?
 - What were negative experiences or failures?
 - What were turning points?
 - When did you start doing things differently?
 - What were milestones over the years?

(also remove events from the draft timeline when they appear not to be important moments)

In dept discussion of key events on the timeline

Discuss each event on the timeline in detail using the prompts below.

Prompts

- Can you tell me more about that?
- Can you tell me the story behind that?
- What happened exactly?

Involved actors

- What organisations were involved? Which persons?
- Who had an important role? Why?
- What was your relationship with these actors? How did you usually collaborate?
- What role did *involved actors* have?
- What was their view on this event/change?

Conditions

- Why did that change?
- What conditions led to this change?
- Can you tell me more about what happened before this change/event?

Consequences

- What happened as a consequence?
- How did your JOGG approach change after this?
- How was the change visible? (e.g. in an action plan)

Additional questions based on draft timeline

Address these community specific topics/question during the discussion of the timeline. If these have not come up during the interview, ask them after the timeline is complete.

Topics are based on document analysis and different for each community. Example questions community 3:

- JOGG is mentioned in health policy 2013, before JOGG officially started. Why was this so explicitly mentioned in policy documents? How did that happen? Why did it take a few years after that to officially start JOGG?
- In the health policy 2013 you also describe that you aim to implement the components of the JOGG approach before you officially start. Why? Did you do that? How?
- In the plans I see that JOGG was a follow up on an existing programme. Can you tell me more about that programme? Why was JOGG implemented as a follow up? What was followed up and what was new?
- What did JOGG add to other existing programmes in the community?
- After few years after the start of JOGG you merged with another community. To what extent were health policies in these communities similar/different? What were differences between the JOGG approaches in the communities? How did you merge these together?
- What was the role of community sport coaches in both communities? What was their role in the JOGG approach? How is that now?
- A while ago you set up working groups in neighbourhoods. Are these still active? What is the role of JOGG in these working groups?
- In your plans I see an emergent focus on sustainability of the approach. Can you tell me more about that? How do you do that? Why?
- I see in your programme plans the influence of covid 19 over the past year. Can you tell me about that? What influence did that have on your implementation?
- I see new goals in each programme plan. How do you develop these goals?
- In one of your plans I read that you learned to 'work with small successes' with educational partners. How did you learn this? Did you adapt your implementation strategy? How?
- In one of the documents you state that 'more partners are joining'. Who? What do they do when they join? Which partners have you not yet been able to involve?
- You have a tight schedule until the JOGG approach is planned to end, with a lot of goals. What do you expect to be able to accomplish in that time? What not?
- What do you think you can still improve in your approach?

Reflect on the timeline (10/15 minutes before the end of the interview)

We are almost out of time, so let's check if we have discussed the most important topics. Looking at the timeline now:

- Is it complete?
- Does it tell the whole story?
- Is there anything missing?

Wrap up (5 minutes)

We have come to the end of the interview:

- Is there anything that we have not discussed yet that we miss or that you would like to have talked about?
- What other stakeholders in the community should we interview to gain insight into the implementation of the JOGG approach?
- Thank you for your participation

S3.3 APPLICATION OF THE CRITICAL EVENT CARD (EXAMPLE)

This supplementary file contains the completed CEC for the phase of change 'integration with other local (health) programmes' for community 3 and community 5.

Events and conditions that were considered critical to the reconfiguration of the programme in this implementation phase are underlined.

Title	Integration of the JOGG approach with sport programme (community 3)
<i>Controversy</i>	• After the first JOGG coordinator quit (due to personal circumstances), the employment of a new <u>JOGG coordinator was transferred from the municipal government, where the coordinator was initially employed, to the sport service organisation by policy officers at the municipality. This was done in order to facilitate the contact of the JOGG coordinator with practice (professionals and target group)</u>
<i>Actors and their interests</i>	<i>Human</i> • At the Sport Service Organisation 3 different programme managers were employed. Each had a different focus: 1) stimulating physical activity with citizens 2) the healthy environment (JOGG) 3) implementing the concept of 'positive health' with adults. • At the Sport Service organisation 'Community Sport Coaches' were employed to implement initiatives in practice. • Health policy officers from different sectors: health, sport, welfare. They all assigned their own tasks to the Sport Service Organisation to attain their policy goals. <i>Non-human</i> • Interviewees describe a <u>culture of intersectoral collaboration within municipal government</u> (before and during implementation of the JOGG-approach). The policy officer involved with JOGG describes that they put a lot of effort and time into stimulating intersectoral collaboration. • Policy officers that were interviewed describe that they have a <u>culture of listening and collaborating with organisations and professionals in practice. Instead of only giving orders about what has to be done they actively try to gain information about what the community needs and how they can facilitate that from municipal government.</u> • The concept of 'positive health' gained popularity among Dutch policy makers since 2016.

Title	Integration of the JOGG approach with sport programme (community 3)
<i>Mediation</i> • <i>Actions</i> • <i>Interactions</i>	The original focus of the Sport Service Organisation was to stimulate sport and physical activity in the community. When the implementation of JOGG was assigned to the Sport Service Organisation by the municipality, a new focus became the healthy environment. The two programme managers noticed while implementing these two programmes that in order to stimulate child health, it was important to involve their parents and to not just talk about overweight but also about a more positive way of looking at health. They discussed this with the policy officers that they collaborated with. These eventually agreed to broaden the tasks and employ a programme manager that specifically targeted health promotion in adults using the concept of 'positive health'. <i>NOTE: there is not more detail about this process in the data.</i> The three programme managers worked within the same organisations and collaborated. <u>They noticed that they had a lot of overlap in their tasks, their goals, their approach, their collaboration partners and meeting structures. They discussed this amongst each other and discussed this with the policy makers they were in contact with. They wanted to improve collaboration and avoid doing double work. Policy officers from different sector agreed that the tasks that they had given the Sport Service Organisation had a lot of overlap.</u> <u>The policy officers therefore, in collaboration with the programme managers, chose to start a project to bring the different goals together into one big programme within the Sport Service Organisation.</u> The policy officer that was responsible for JOGG discussed this with their community advisor from the national JOGG organisation. The national JOGG organisation then provided a coach specifically to lead this project. This coach brought the policy officers, programme managers and network partners together to form new ambitions and goals and write an overarching programme plan. When this plan was ready it was signed by the collaboration partners in the network of the Sport Service Organisation to mark the start of this programme.
<i>Consequences</i>	The new programme has a new name and 'JOGG' is not mentioned anymore. The new programme plan does a lot of similarities with the JOGG-approach (methodological elements, goals, aim). This is because the JOGG-approach and its elements were used as the foundation for the new plan. It is however a larger programme with an overarching aim and wider target group.
<i>Inscriptions</i>	This process, which was described by interviewees, is confirmed in programme documents.
<i>Location and time</i>	Unclear when this process started. JOGG started in the municipality in 2015, official integration of JOGG within the new programme happened in 2018 (three years after the JOGG approach was started in the community).
<i>Other</i>	• -

Title	Integration of the JOGG approach with GIDS (community 5)
<i>Controversy</i>	• <u>The contract between the municipality and the national JOGG organisation almost ended</u> (every two years new contract has to be signed). The idea of the second phase of the JOGG-approach is that initiatives and partnerships that are developed in the first phase are strengthened and expanded. • The national policy initiative GIDS (Healthy In The City) was introduced in 2014. GIDS is a programme initiated by the national government in which municipalities receive financial support in order to improve the health of vulnerable groups (e.g. low income) and promote health equity. The idea of GIDS is that it is a coherent neighbourhood approach that includes multiple elements (e.g. changes to the physical environment, social support, knowledge) and active citizen participation.
<i>Actors and their interests</i>	<i>Human</i> • Health policy officer: - Responsible for the development of health policy in the municipality. Was involved in the preparation stage for JOGG, initiation of JOGG and implementation of GIDS. - Sees themselves as early adapter and believes that it is important to apply early for national opportunities for (financial) support regarding health programmes. - Background in youth, social welfare and health. <u>Has a very pronounced vision that these are all related and should be regarded as such in policy making. Speaks about health as a system of many interacting factors and is convinced that health policy making requires intersectoral collaboration.</u> • Public Health Service: public organisation that will employ the project manager for GIDS. • JOGG coordinator/project manager Decisive Action for Health: - Has been responsible for the coordination of both programmes for several years. - Employed at Public Health service • Partner organisations that were involved in the JOGG network in the municipality: e.g. policymakers youth, neighbourhood managers, social welfare organisation, sport service organisation, health care workers. <i>Non-human</i> • <u>The health policy officer and JOGG coordinator (from Public Health Service) have collaborated for years and describe their collaboration and relation as really well. They have a lot of similar visions about health. They speak to each other regularly. Their contact is both formal and informal.</u> • The health programme 'Decisive Action for Health' (programme initiated by national governments, in which the municipality was supported in developing and implementing intersectoral policy on the health theme 'overweight') ended in 2014. The collaborations that were set up within this programme formed a basis for other health programmes regarding the prevention of overweight including JOGG and GIDS. • The structure of meetings and partnerships regarding child and youth health promotion/overweight that had already been developed in existing JOGG-neighbourhoods.

Title	Integration of the JOGG approach with GIDS (community 5)
<i>Mediation</i> • <i>Interactions</i> • <i>Actions</i>	The health policy officer applied for the programme GIDS and considered Decisive Action for Health and JOGG as important programmes in the municipality that could be used as a foundation to develop and implement GIDS in the municipality. The health policy officer wrote the action plan for GIDS according to her vision on health promotion, which was officially approved by municipal decision makers. In this action plan GIDS is explicitly connected to JOGG: GIDS is framed as a means to strengthen and expand JOGG and in turn JOGG is presented as a good foundation (the methodology of the approach and the existing JOGG partnerships) on which GIDS can build. Health policy officer wrote a policy proposal to assign the Public Health Service organisation to employ the project manager for GIDS. Argumentation for this is that this organisation has experience with the project management of similar programmes (such as JOGG). This proposal is approved by decision makers. Within the Public Health Service the JOGG coordinator is assigned to take on the project leader role for GIDS, considering this persons experience with the management of other programmes and since GIDS will be connected to JOGG. GIDS is started in five neighbourhoods, of which 2 were already implementing JOGG. Using the resources of GIDS, initiatives that were developed within the JOGG-approach (e.g. vegetable campaign, healthy schools) are implemented in other neighbourhoods. In neighbourhoods where JOGG was initially implemented, the existing partnerships and meeting structures were preserved.
<i>Consequences</i>	Over the next years, JOGG slowly starts to merge with GIDS. This happens in practice and on paper. From 2016 on, JOGG is included in the GIDS yearly programme plan, as the chapter aimed at youth. No specific new JOGG programme plans are made. The JOGG chapter in the yearly GIDS plan is smaller every year GIDS goals and target group are much broader then JOGG. The coordination team describe that since the integration with GIDS new partners have become involved and some existing partner got more strongly involved with GIDS (than they were with JOGG). Different public organisations collaborate more closely since GIDS started. According to the coordination team this is a consequence of the broader aims and the broader perception of 'health' (not just healthy lifestyle, but also health equity, wellbeing)
<i>Inscriptions</i>	Official approvals from decision makers and yearly programme plans for GIDS confirm described mediations and consequences. In the yearly GIDS plans, the JOGG chapter is smaller every year.
<i>Location and time</i>	GIDS resources were received in 2014, initially for a period of 4 years. The first phase of GIDS started in 2015, in this phase neighbourhood scans were made with citizens and professionals in neighbourhoods. In the second half of 2015 the first GIDS/JOGG programme plan was developed based on these scans.
<i>Other</i>	-

S3.2 PHASES IN THE IMPLEMENTATION OF THE JOGG APPROACH IN 9 COMMUNITIES



IS = Implementation strategy

^A Programme initiated by the national government, in which municipalities were supported in developing and implementing intersectoral policy on a specific health theme (smoking, alcohol and drugs or overweight)

54.1 COREQ CHECKLIST

Domain 1 research team and reflexivity

1. *Interviewer/facilitator*

Irma Huiberts, Jorien Slot-Heijs

2. *Credentials*

IH: MSc.

JH: MSc.

3. *Occupation*

IH: PhD candidate at AmsterdamUMC and researcher at the Mulier instituut (scientific sport research institute; <https://www.mulierinstituut.nl/english-about-us-mi/>)

JS: Researcher at the Mulier Instituut

4. *Gender*

IH: female

JS: female

5. *Experience and training*

IH: qualitative research training through courses and 1 years of qualitative research experience

JS: 5 years of experience in both qualitative and quantitative research, qualitative research training through courses

Relationship with participants

6. *Relationship established*

No relationship existed before the study commencement with any of the interview participants. The researchers had exclusively been in contact with the participants to plan the interviews over the phone or email.

Several focus group participants had met JS before, because she had been involved in several other research projects regarding the JOGG approach over the years.

7. *Participants knowledge of the interviewer*

The participants were informed about the goal of the interview/focus group and about the academic background of the interviewers, the types of research that they were involved in and the research institute they represented.

Moreover, interview participants were informed about the funding of the study by JOGG. Anonymity was ensured in the informed consent and emphasised at the beginning of the interview.

8. *Interviewer characteristics*

JS had been involved in several research projects regarding the JOGG-approach for over four years and was therefore very familiar with the programme. JS had also conducted numerous Monitoring and Evaluation training sessions for local JOGG coordinators (on behalf of the national JOGG organisation). Throughout these experiences, JS observed that coordinators often struggled with their role and tasks. As a result, JS was highly interested in the study, hoping to provide insights to the national JOGG organisation on how to enhance the training and support of their local coordinators.

IH was not acquainted with JOGG-approach up until the beginning of 2020. The current study was part of a larger study regarding the implementation and working mechanisms of the JOGG-approach, in which IH was involved as PhD candidate.

Domain 2 study design

Theoretical framework

9. *Methodological orientation and theory*

In this study we followed a more inductive approach in phase 1 of the study (interviews with coordinators) and deductive approach in phase 2 of the study (focus groups with JOGG advisors). In phase 1 we followed an inductive approach to the interview protocol and analysis to gain insight into the experiences of the coordinators. We wanted to explore how they experienced and applied their role as coordinator, without imposing a specific direction. To identify commonalities and differences in their experiences and further unpick and explain these commonalities and differences we conducted thematic analysis. Thematic analysis, is a suitable analysis strategy for this purpose, as it involves identifying, analysing and reporting patterns (or themes) in the data. The goal of phase 2 was to validate and refine the themes identified in phase 1. Since the advisors from the national organisation advised different local coordinators, they possessed an overview of different types of coordinators and thus offered a distinct perspective on the expected and applied roles of local coordinators and required competences. This additional perspective enriched our understanding of the coordinators' narratives. Additionally, this phase aided in assessing whether we had approached data saturation.

Participant selection

10. *Sampling*

Interviews: The participating coordinators were purposefully sampled to ensure variation in several key factors in the organisational context (as described by previous studies): years of experience as coordinator, employer and working hours per week appointed for coordination. In addition we considered factors hypothesized by the national JOGG organisation to be relevant for explaining variation between coordinators: population size, start year.

A list of potential coordinators for the interviews was provided by the national JOGG organisation. Initially, our goal was to conduct 16 interviews, ensuring adequate variation in predefined

coordinator characteristics while maintaining feasibility in data collection. To achieve this, we requested the national JOGG organisation to compile a list of 20-25 coordinators (16 as our initial target and additional as backup) who had served as coordinator for at least one year (to ensure that they possessed some experience in this role) and who varied in the characteristics described above. We received a list with contact details of 23 potential participants. We excluded 2 participants from this shortlist who were already involved in other research projects. Subsequently, we randomly selected 16 out of the remaining 21 coordinators to invite for participation

Focus groups: Advisors from the national organisation (phase 2 of the study) were sampled through an open call to the existing group of 11 advisors. Eight were willing to participate.

11. Method of approach

All participants were initially contacted via email. This email provided an overview of the study and purpose of the interviews. A reminder was sent to those who did not respond within two weeks. People who were interested in participating were sent an informed consent form and were contacted either by email or phone to schedule the interview.

12. Sample size

In total, 174 local communities were implementing the JOGG approach at the time of the study, each with one local coordinator responsible for implementation. We only included coordinators who had been in charge of implementation for at least one year. However, there was no overview available regarding the number of coordinators to whom this criterion applied.

We aimed for a sample size of 16 coordinators. This would allow for sufficient variation in interview characteristics, while maintaining feasibility in data collection. Ultimately 12 of the 16 invited coordinators agreed to participate. As coordinator characteristics were sufficiently diverse and no new insights emerged during the final of the 12 interviews, indicating data saturation, we refrained from sending out further invitations.

For the focus groups with the national organisation, we initially planned two sessions and aimed to have at least three JOGG advisors present at each focus group. Eventually eight advisors were available for participation.

13. Non-participation

Four coordinators that were invited did not participate. One coordinator did not respond after several reminders and three participants declined participation due to lack of time (n=1), a job change (n=1) or without providing a reason (n=1).

We believe that the non-participation did not significantly impact the results. It is possible that time constraints influenced the decision of the two coordinators who were unclear about their reasons for not participating. Time constraints frequently emerged as a topic of discussion within our current sample. Hence, we are confident that we have gained sufficient insight into these time constraints.

Four advisors of the national organisation did not participate. We did not ask for their reason for not participating. However, since the goal of the focus groups was to validate and refine findings from the interviews, we believe non-participation did not significantly impact the results.

Setting

14. Setting of data collection

All interviews were conducted online through video call software: Microsoft teams.

15. Presence of non-participants

No. Only the participant(s) and interviewer were present during the interviews and focus groups.

16. Description of sample

A description of the sample is provided in the methods section under subheading 'recruitment and sample'. A description of coordinator characteristics is provided in Table 1 in the manuscript.

Data collection

17. Interview guide

The interview protocols can be found in additional file 2. Semi-structured interview protocols were developed by IH and JS, in collaboration with the research team (DC and AS).

The development of the interview protocol was guided by the research aim. We aimed to explore how coordinators fulfilled their role in building intersectoral collaboration, taking into account the organisational context in which they operated. With this aim in mind we developed interview protocols, meanwhile considering general guidelines to developing effective interview protocols (Green and Thorogood, 2013).

At the beginning of the interviews we adopted a more open approach, asking coordinators to tell us about the programme, their strategy to building intersectoral collaboration and rationale behind this strategy. This allowed coordinators to explain their local situation and organisational context to us and share their own story and experiences. This provided the researcher with a better understanding of the local programme and laid the groundwork for further inquiries during the interview.

Second, we transitioned to more focused questioning, specifically addressing coordinators' roles in fostering intersectoral collaboration. We asked coordinators to reflect on their role in building intersectoral collaboration and then proceeded to more detailed descriptions of their tasks and the competencies needed to execute these tasks effectively.

The protocol for the focus group with the advisors from the national organisation was structured differently, since the main objective of these focus groups was to validate and refine themes that emerged from the interviews. Therefore the protocol included a presentation of emerged themes followed by more direct questions to open a discussion about these themes. Including, whether

advisors recognised findings from the interviews in communities that they advised. In addition, we asked the advisors to offer additional insights on the coordinator competencies they thought were necessary to effectively build intersectoral collaboration.

18. Repeat interviews

No repeat interviews were carried out.

19. Audio/visual recording

All interviews and focus groups were audio recorded.

20. Field notes

Notes were made by the interviewer, to help the interviewer in the line of inquiry. For example to revisit topics later. After the interviews both IH and JS made notes to reflect on the interview regarding 1) their perception the coordinator and main experiences of the interview 2) what went well and what could be improved about their role as interviewer. The notes were not used in analysis.

21. Duration

Interview duration varied between 60 and 90 minutes. Focus group duration was 75 minutes and 88 minutes.

22. Data saturation

Coordinator characteristics were sufficiently diverse and no new insights emerged during the final of the 12 interviews. In addition no significant new information surfaced during the focus groups with advisors from the national organisation (who held an overview perspective in their role as JOGG advisor for various local coordinators). Therefore we concluded that we had approached data saturation.

23. Transcripts returned

No, transcripts were not returned to participants.

Domain 3 analysis and findings

Data analysis

24. Number of data coders

JS and IH both coded the data. JS was responsible for the initial open coding. IH and JS jointly discussed and refined codes. More detail on the coding phase can be found under the subheading 'analysis' in the manuscript.

25. Description of the coding tree

A coding tree is not described, because coding was initially a largely inductive, data-drive process, considering the full dataset. Because we were interested in the role of the coordinators in building

intersectoral collaboration, we did conduct the initial coding of the entire dataset with this question in mind. Final themes that emerged from the analysis phase are presented in Table 2. More detail on the coding phase can be found under the subheading 'analysis' in the manuscript.

26. *Derivation of themes*

The derivation of themes was mostly a date driven process. However, given our interest in the role of coordinators in building intersectoral collaboration, we did code the dataset with this focus.

27. *Software*

MAXqda

28. *Participant checking*

No, participants did not provide feedback on findings. We did collect feedback on the findings of the interviews during the focus groups with advisors from the national organisation.

Reporting

29. *Quotations presented.* 30. *Data and findings consistent* 31. *clarity of major themes* 32. *Clarity of minor themes*

Themes and subthemes are described in the results section, including an explanation of differences we identified between coordinators. Quotes from a range of participants were selected to illustrate identified themes. We specifically reflect on findings regarding the organisational context in a subsection of the results.

S4.2 INTERVIEW AND FOCUS GROUP PROTOCOLS

Interview guide JOGG coordinators

Introduction

- Introduction of researcher (*research institute, studies involved in, interest, academic background*) and participant
- Introduction of the study: part of a larger evaluation study of the JOGG-approach (*explain*), two goals for this interview: 1) gain insight in local implementation of the approach and role of the JOGG coordinator in the implementation 2) gain insight in the knowledge, skills and characteristics needed to fulfil this role successfully. Using the results from this study we can advise JOGG on the development of their training and support structure for coordinators
- Check signed consent form
 - Repeat: anonymity in reporting results. Data and information about participation will not be shared with other parties, including the national JOGG organisation.
 - Questions about consent?
- Other questions or comments in advance?
- Start audio recording

Part 1: implementation of the JOGG-approach

In this first part of the interview, we will discuss the implementation of the JOGG approach. I am curious about how you implement the approach and especially why in this way. There is no right or wrong. We still know little about how the approach is implemented locally, and we want to gain more insight into this.

General

- Can you explain what the JOGG approach is for you?
- Why has the municipality chosen to implement the JOGG approach. What kind of effects does the municipality expect from the JOGG-approach?

Implementation and results

- JOGG is different in every municipality. Can you tell me about the implementation of the JOGG approach in your municipality? *Possible follow-up questions:*
 - What are your goals?
 - How do you achieve your goals?
 - Who do you collaborate with?
- Why are you doing it this way? *Possible follow-up questions:*
 - *Why does this implementation strategy work to accomplish the goals?*
 - *Do you think that this is the best way to implement the JOGG approach?*
- How did you (or others) decide to implement the JOGG approach this way? *If not clear, ask more detailed follow up questions, e.g. how they chose target groups and how they set goals.*

- In your experience, what has been accomplished by implementing the JOGG approach in the municipality? *Possible follow up questions:*
 - *What would be different in this municipality if the JOGG-approach had not been implemented?*
 - *What concrete actions and changes are the result of JOGG within the municipality?*

Barriers and facilitators

- What is the main barrier in your municipality for the implementation of the JOGG approach?
- What facilitates the implementation the JOGG approach in this municipality?
 - *For example: things that will be more difficult for other municipalities but work very well here.*

Part 2: The JOGG coordinator

We now move on to the second part of the interview, which is about your work as a JOGG coordinator. There are no right or wrong answers, because we know that the JOGG approach is different everywhere.

Role and competencies

- What is your role in the local JOGG approach?
 - *Interviewer writes down roles*
- *Follow up questions on (each) role:*
 - *Clarify role and tasks: What exactly do you do in this role?*
 - *Follow up: why is this role important? Why do you (have to) do this?*
 - *Follow up: what knowledge and skills do you need for this? What personal characteristics do you need? What kind of person do you have to be?*
- *Check if all roles and activities are discussed:*
 - Show overview of discussed roles, tasks and competencies (share screen)
 - Are there any other activities you are involved in as JOGG coordinator? → *follow up with previous questions if new things come up.*
 - *Also check based on part 1 of the interview*
- Have your activities/tasks changed over time?

Training and support

- How did you acquire the knowledge and skills you need as a JOGG coordinator?
- What else would you like to learn? Why? And how?
- Are there any roles/tasks that someone else in your municipality can or should do?
- How can the national JOGG organisation support you on this?

Wrap up

We have come to the end of the interview. Thank you for your participations.

- Do you have additions? Important things that we have not talked about yet?
- Questions?
- If questions or remarks come up later, contact us (provide e-mail address and phone number)
- Explain how results will be reported.

Focus group guide JOGG advisors

Preparation: *send short description of roles to participants one week in advance. Ask to read this document to prepare for the focus group.*

Introduction

- Introduction study and goal of the focus group (*validate and refine roles and competencies identified with JOGG coordinators*)
- If necessary: introduction of interviewers and participants (*some advisors are familiar, because the interviewers have been involved in monitoring and evaluation studies on the JOGG approach before*)
- Thank you for participating
- Emphasize expertise of advisors (*you see and advise a lot of different JOGG coordinators in different municipalities*)
- Interaction during the focus group is encouraged. Ask questions or add to others if you feel the need. Keep microphone open, to ensure a more dynamic conversation.
- Questions or comments in advance?
- Check signed consent form, start audio recording
- Check whether everyone has roles in front of them (sent in advance), once read out loud all short descriptions

Part 1: roles JOGG coordinator (JC)

We have seen that JC's have different implementation strategies and take on different roles in their municipality. We see that taking on a certain role to some extent affects the way in which the JC works, and that we can use this to indicate the differences between JCs. It is not the case that every JC only takes on one role, but sometimes predominantly takes on a certain role.

1. What is your first impression of this overview of roles? are the roles recognizable? *Go around the room and discuss (make sure everyone gets a chance to answer the main question). Possible follow-up questions:*
 - Which role do you recognize/not recognize? Why/why not?
 - Do you have an example of a JC in a community that you advise in who you recognise a certain role? What do you see happening there?
2. *Discuss the clarity and completeness of the descriptions of the roles.*
 - Are roles clearly described?
 - Questions about roles during the focus group (e.g. 'what do you mean by...') can indicate that a role is not clear.
 - Are the descriptions complete? *Pay attention to the content of the roles.*
 - Do the descriptions match the role as you would see it?
 - Are there additional tasks for coordinators in this role that are not described now?

Make sure all roles are covered. If a role does not come up in the discussion: is this because the role is fully clear/complete? Or because it is not?

Ask follow up questions to clarify if participants are talking about experiences or about the ideal situation.

3. Do you see other role(s) or tasks in the work of JOGG coordinators that do not fit the described roles? *Try to get consensus. Ask follow up questions to clarify if participants are talking about experiences or about the ideal situation. Other possible follow-up questions:*
 - *What are other roles?*
 - *How would you describe them?*

Do you think we now have a complete picture of the roles/activities of a JC?

Short break: facilitators roughly rearrange the roles according to the previous discussion

Part 2: competencies per role

1. For each role, write down which competencies are needed in order to be able to fulfil the role. It may help to think about a JC that you advise that takes this role. Competencies may include, for example, skills that a JC needs to be able to properly fulfil the role.
Give participants a few minutes to write down for themselves.

Discuss for each role. Have each advisor name one thing that they wrote down for the role, ask for reactions from others. Possible follow up questions:

- *What exactly does this mean?*
- *What exactly should a JC be able to do?*
- *What does that look like?*
- *What does a JC do?*
- *Do you have an example of that?*

Facilitator lists the competencies for each role.

2. Share screen and ask for additions

Wrap up

We have come to the end of the interview. Thank you for your participations.

- Do you have additions? Important things that we have not talked about yet?
- Questions?
- If questions or remarks come up later, contact us (provide e-mail address and phone number)
- Explain how results will be reported

55.1 COREQ CHECKLIST

Domain 1 research team and reflexivity

30. *Interviewer/facilitator*

Irma Huiberts

31. *Credentials*

Msc.

32. *Occupation*

Researcher at the Mulier Institute (scientific sport research institute; <https://www.mulierinstituut.nl/english-about-us-mi/>) and PhD candidate at AmsterdamUMC

Gender

Female

33. *Experience and training*

Two years of qualitative research experience and qualitative research training through courses.

Relationship with participants

34. *Relationship established*

No relationship existed before the study commencement with any of the research participants. The researcher had only been in contact with the participants to plan the interviews/REM sessions over the phone or email.

35. *Participants knowledge of the interviewer*

The participants were informed about the goal of the interview/REM session, and were informed about the larger study that the interview was one part of. Participants were also informed about the role of the interviewer in the study and the funding of the study (by JOGG). Anonymity was ensured in the informed consent and emphasised at the beginning of the interviews.

36. *Interviewer characteristics*

The interviewer had been involved with research on the JOGG approach for two years and had previously conducted interviews with local implementing team and members of the national organisation. Before that, the interviewer was not involved in the topic of health promotion.

Domain 2 study design

Theoretical framework

37. Methodological orientation and theory

In this study we applied a combination of thematic analysis (to analyse the Ripple Effects mapping results) and theory building, gaining inspiration from comparative case study research and grounded theory. More detail is described in the 'analysis' subsection of the methods section.

Participant selection

38. Sampling

Participants were purposefully sampled for their engagement in or being affected by the JOGG approach in the community.

- The research team identified people who had been involved in the programme in documents about the local programme (e.g. programme plans, policy plans, meeting notes, logbooks)
- The local implementation team was asked to suggest people who had been involved in or affected by the programme
- Participants in the REM sessions and interviews were asked to provide suggestions on other people who had been involved in or affected by the programme.

39. Method of approach

Participants were initially contacted through email. This email provided an overview of the study, purpose of the REM session/interviews and an explanation of why they were invited to participate. People received a reminder email after not responding within two weeks. People who were interested to participate were sent an informed consent form and were emailed/called to schedule the interview.

40. Sample size

Sample size for each of the five communities is reported in Table 1. In total we involved 26 participants in eight REM sessions and conducted additional individual interviews with 24 stakeholders. In each community sampling continued until no new potential participants were suggested by the implementing team or participants in REM sessions/interviews. To facilitate discussion in the online REM sessions, these were conducted in small groups of 3-5 participants.

41. Non-participation

Four people declined participation due to a lack of time. In addition to having a lack of time, one of these people also stated to be unsure why they were invited, as they knew very little the JOGG approach in the community.

Setting

42. Setting of data collection

All REM sessions and interviews were conducted online through video call software: Microsoft teams.

43. Presence of non-participants

No. Only the participants and interviewer were present during the interviews. During the REM sessions there was also a research assistant present (MH).

44. Description of sample

Participants included professionals from schools, childcare, youth work, health service organisations, sport service organisations, private organisations (e.g., supermarket) and policymakers.

Data collection

45. Interview guide

The interview protocols can be found in Supplementary file 2. Protocols were developed by *author 1* in collaboration with the research team, based on REM guidelines. The interviews and REM sessions were semi-structured, allowing participants to openly discuss their perspectives and to follow up on areas of interests. During the interviews, participants were asked which outcomes they perceived of the JOGG approach. These outcomes were also used to probe for further information.

After each session the interviewer reflected on the interview and refined the protocol if necessary. We made the following adaptations:

- We added further differentiation in the interview protocol. For those participants who were substantially involved in the JOGG approach, we followed the theming and rippling method to gain insight into the broadness of all JOGG outcomes. For those participants who had been involved in only one project, we assumed an in-depth approach, asking them to share their stories and outcomes to create more detailed descriptions.
- We changed how we presented the miro board to participants. At first we did not include the layers for direct and long-term outcomes, but only presented the middle spot with the municipality name on it. We found that adding the layers helped participants in organising the outcomes and discussing whether outcomes were direct or indirect.
- During the first REM sessions we provided participants with examples of what types of outcomes they could think of when considering outcomes of JOGG to prompt them to think broadly about outcomes (e.g. projects that were developed with JOGG, resources that were created by JOGG, enthusiasm that was created). However, we during the first to REM sessions we found that participants already had broad perspective on different types of outcomes that could be expected and we decided to not provide examples to avoid steering participants in a certain direction.

- The protocol in supplementary file 2 presents the version of the protocol after these adaptations were made.

46. *Repeat interviews*

No repeat interviews were carried out.

47. *Audio/visual recording*

All REM sessions and interviews were audio recorded.

48. *Field notes*

Notes were made by the interviewer, to help the interviewer in the line of inquiry. For example to revisit topics later. After the REM sessions the interviewer made notes to reflect on what went well and what could be improved in for future sessions. The notes were not used in analysis.

49. *Duration*

REM sessions lasted between 75 and 90 minutes. Interview duration varied between 15 and 45 minutes (approximately 30 minutes).

50. *Data saturation*

In each community sampling continued until no new potential participants were suggested by the implementing team or participants in REM sessions/interviews. We believe that for each community we reached a large enough sample size, with different (types of) stakeholders, to gain a detailed account of the JOGG approach in the community from different perspectives.

51. *Transcripts returned*

No. Participants did receive the completed REM map for member check. In addition, all participants received the community specific small report that described the results of the case study for that specific community.

Domain 3 analysis and findings

Data analysis

52. *Number of data coders*

IH coded the transcripts and interviews. During the identification and cross case analysis of impact pathways, codes were discussed in the research team (IH, MH and DC). In some cases this resulted in jointly checking and discussing underlying data segments.

53. *Description of the coding tree*

Data was coded according to the REM map that was constructed during the sessions, using the MAXmaps function in MAXqda, which enables graphic data representation. When a topic from

the additional interviews was not included in the map yet, IH added the additional information to the map.

54. Derivation of themes

In the analysis we focussed on the types of outcomes that were reported and impact pathways. The themes that were found within the outcomes and impact pathways were derived from the data.

55. Software

MAXqda

56. Participant checking

We reported the findings for each community in a community specific small report that described the results of the case study. This was sent to all participants to ensure that it resonated with their experiences. Study findings from results across cases will be published in April 2024 and will be reported back to the programme implementation teams.

Reporting

57. Quotations presented

Yes, from multiple participants from different communities and organisations. Quotations are identified through community number and organisation/occupation of the participant.

58. Data and findings consistent 31. clarity of major themes 32. Clarity of minor themes

During data analysis, the causal pathways described in the results section were iteratively checked against the community specific REM maps and underlying data segments. Themes and significant differences between communities are described in the results section.

S5.2 INTERVIEW PROTOCOLS

Ripple effects mapping sessions

Preparation

- Email informed consent form to participants before start of the session
- Prepare appreciative inquiry questions to put in the chat
- Prepare Miro board as follows:



- Ensure access to the miro board for participants
- Facilitator will facilitate the discussion. Research assistant will map the discussion onto the board.

Welcome and introduction (10 minutes)

- Welcome and introduction of the researcher and assistant
- Explanation of the project and the purpose of the meeting: This municipality is part of a larger study on how the JOGG approach works and how it can be successfully implemented under different circumstances. In this study we are interested in the outcomes of the JOGG approach at the municipal level and want to better understand how this works. Therefore, in several municipalities, we conduct in-depth research, and this municipality is one of them. Today, we

want to explore what the JOGG approach has yielded in your municipality. We aim to assess the impact of JOGG, explore the difference it has made in the municipality, and also examine what strengths exist in the current approach, as well as opportunities for improvement. We will do all of this by creating a mind map of the results and impact of JOGG in the municipality. At the end of the session we will reflect on possible improvements and next steps for the JOGG approach in this municipality.

- You were invited to participate because you have in some way been involved in the JOGG approach in this municipality (in the past)
 - Everyone has their own experience with and perspective on JOGG. We need all of these experiences to get a complete picture. So feel free to share anything that comes to mind. And also give each other space to share their own experiences.
 - We want to get an understanding of the overall impact of JOGG. However, this is not easily distinguished from other developments in the municipality. Therefore, we will also consider broader changes related to lifestyle and health promotion among children and adolescents.
- Questions?
 - Introduction of participants
 - Check signed consent form
 - Start audio recording

Warm-up (15 minutes)

The goal of this part of the session is to gain a first insight into the outcomes of the JOGG approach and to create an interactive and positive atmosphere in the session. If there are more than four participants, this part of the session will be conducted in two breakout rooms, otherwise this will be a group exercise.

- Later, we will make a mindmap of the outcomes of the JOGG approach. Before we do that I want to reflect with you on your experiences of the results of the JOGG approach and how you were involved. Think about the following questions (*put in the chat*)
 - What is the most significant results of JOGG in your organisation? What result are you most proud of?
 - In your opinion, what are the most significant results of JOGG in this municipality overall?
- Ask each participant to share their answers with the group
 - Follow up on whether other participants recognise these results

A research assistant adds the outcomes that are suggested onto the miro board.

Mind mapping (50 minutes)

Instruction: we are going to make a mindmap of the JOGG outcomes and impact in this municipality. We have added everything that has come up so far on the board that I will share with you in a minute. Now we are going to further unpack these results and add on.

- Share miro link. Check if participants are able to open the link and see the board.
- In the middle you can see JOGG. In the circle directly around you can see direct outcomes. Further away we see more indirect outcomes and long-term impacts.
- [research assistant] will add everything we talk about onto the map and you can watch the board and check how it is written down

- Based on this, we can delve deeper into the discussion. We will further elaborate on each of the outcomes: what are examples? Direct or indirect? How are the outcomes connected? Which stories/results are similar?
- About the map:
 - The completed map will provide an understanding of how impact is achieved. How far-reaching is the impact of JOGG? What is the process behind it? What contributes to it?
 - Additionally, it will offer an overview of what might still be missing
 - This is a draft version. We will tidy it after this session and supplement it with input from others
 - Let's create it together. Think along, add to it, be critical. Make sure that what you say is accurately reflected

Mind mapping

Discuss each outcome that was suggested in the first part of the session.

For each more abstract/general outcome:

- Is this a direct outcome, indirect outcome or long-term impact?
- Can you give an example of such outcome? Can you share a story about this? Can you tell us more about that?
- Draw out the ripples by elaborating on each outcome (*use prompts*):
 - What happened to achieve that outcome and how JOGG contributed
 - The ripple effects of that outcome
- Discuss connection to other outcomes

For each specific/concrete outcome

- Is this a direct outcome, indirect outcome or long-term impact?
- Place close to similar outcomes (to form one theme)
- Draw out the ripples by elaborating on each outcome (*use prompts*):
 - What happened to achieve that outcome and how JOGG contributed
 - The ripple effects of that outcome
- Discuss connection to other outcomes
- Cluster similar types of outcomes and ripples

Add new outcomes/impact and discuss

If participants are strongly involved in JOGG and know a lot about the JOGG actions and results, put more focus on adding new outcomes; otherwise focus on in-depth questions to draw out the ripples of the outcomes participants are involved in.

- Other outcomes or impacts of JOGG in the municipality?
 - What are other activities or elements of JOGG in the municipality? What are their results?
 - What is missing on the mind map?
- Discuss each outcome as described above

Probe for negative or unintended outcomes:

- What were negative, perhaps unintended, results of the JOGG approach?
- What disadvantages have you noticed in working with the JOGG approach?

Prompts

Before the outcome

- How was this outcome achieved?
- What contributed to this outcome?
- How did that come about?
- How were you able to achieve that?
- Who was involved?
- How did JOGG contribute?
- What would have happened without JOGG?

Ripple effects

- What happened then?
- What was the consequence?
- What did people start doing differently?
- What did this lead to?
- What changed because of that?
- For you or your organisation?
- For children/youth?
- What effect did that have?
- What was the result of that?

Reflection (10 minutes)

In the reflection phase we will have another critical look at the mind map. Have a look at the map as it is now:

- What is most interesting about the mind map?
- Is something missing?
- What was the most significant contribution of JOGG?
- What improvements can be made in the future? Do you see any new opportunities?
- What other stakeholders are relevant to improve our understand of JOGG in this municipality?
 - Who should we speak to?

Wrap up (5 minutes)

- Is there anything that we have not discussed yet that you would have like to have talked about?
- You will receive the completed and tidied mind map to check whether it reflects your ideas
- Discuss how results will be reported
- Thank you for your participation

Additional interviews

Preparation

- Email informed consent form to participants before start of the session
- Prepare stakeholder specific topics in the protocol (based on results REM sessions)
 - Specify the 'elaboration on the mind map' questions
 - If we require more information on a specific part of the mind map from this stakeholder we can spend more time on the part 'elaboration on the mind map' during the interview.
 - Add other topics if necessary
- Depending on the involvement of the stakeholder in JOGG interview will be planned for 0.5 to 1 hour

Introduction

- Welcome and introduction of the researcher
- Explanation of the project and the purpose of the meeting: This municipality participates in a larger study on how the JOGG approach works and how it can be successfully implemented under different circumstances. In this study we are interested in the outcomes of the JOGG approach at the municipal level and want to better understand how this works. Therefore, in several municipalities, we conduct in-depth research, and this municipality is one of them. Today, we want to explore the outcomes of JOGG in your municipality and how JOGG contributed to these outcomes.
- [municipality specific addition: *e.g. we have spoken to several other stakeholders in you municipality and they suggested that we speak to you because....*]
- Questions?
- Check signed consent form
- Start audio recording

Introduction participant and involvement in the JOGG approach

- Introduction participant and organisation
- In what way are you involved in the JOGG approach?
 - Collaborations/role/actions
- How do you experience the JOGG approach?/your collaborations with the JOGG team?

Outcomes of JOGG

Within the organisation

- What is the most significant result of JOGG in your organization? What result are you most proud of?
- How were these outcomes achieved?
 - How did JOGG contribute?

In the municipality

- In your opinion, what are the most significant results of JOGG in this municipality overall?
- For each outcome: draw out the ripples by elaborating on each outcome (*use prompts*):
 - What happened to achieve that outcome and how JOGG contributed
 - The ripple effects of that outcome

Probe for negative or unintended outcomes:

- What were negative, perhaps unintended, results of the JOGG approach?
- What disadvantages have you noticed in working with the JOGG approach?

Future:

- What improvements can be made in the future? Do you see any new opportunities?

Prompts

Before the outcome

How was this outcome achieved?
What contributed to this outcome?
How did that come about?
How were you able to achieve that?
Who was involved?
How did JOGG contribute?
What would have happened without JOGG?

Ripple effects

What happened then?
What was the consequence?
What did people start doing differently?
What did this lead to?
What changed because of that?
For you or your organisation?
For children/youth?
What effect did that have?
What was the result of that?

Elaboration on the mind map

In discussions with other stakeholders in the municipality we found that [*municipality specific results*]. Do you recognise this? Can you tell me more about that?

Municipality specific results are for example:

- *Ripple that this stakeholder is (possible) involved in*
- *Most significant outcomes/ripples from the mind map*

Wrap up

4. Is there anything that we have not discussed yet that you would have like to have talked about?
5. You will receive the completed and tidied mind map to check whether it reflects your ideas
6. Discuss how results will be reported
7. Thank you for your participation

S6.1 MODEL FORMULAS

Effect estimate I

Children 5-12 years old

Using linear mixed models, we modelled the effect of exposure to the JOGG approach on BMIz, according to:

$$\begin{aligned}
 y_{ij} = & \beta_0 + b_{0j} + \beta_1 \text{exposure}_{ij} + \beta_2 \text{age}_{ij} + \beta_3 \text{sex}_{ij} + \beta_4 \text{migrationbackground}_{ij} \\
 & + \beta_5 \text{parenteducationlevel}_{ij} + \beta_6 \text{householdincome}_{ij} \\
 & + \beta_7 \text{neighbourhooddeprivation}_{ij} + \beta_8 \text{surveyyear}_{ij} + \beta_9 \text{exposure} * \text{age}_{ij} \\
 & + \epsilon_{ij}
 \end{aligned}
 \tag{1}$$

Where $\beta_1 \text{exposure}$ if the individual lived in a neighbourhood where JOGG was implemented for at least 18 months (otherwise $\beta_1 \text{exposure} = 0$), b_{0j} is the random intercept of the outcome for a municipality j , and ϵ_{ij} is the model residual.

In order to study differential effects of JOGG exposure between subgroups, we alternately included the interaction terms between JOGG exposure and migration background, parent education level and household income in the model, specified as follows:

$$\begin{aligned}
 y_{ij} = & \beta_0 + b_{0j} + \beta_1 \text{exposure}_{ij} + \beta_2 \text{age}_{ij} + \beta_3 \text{sex}_{ij} + \beta_4 \text{migration_background}_{ij} \\
 & + \beta_5 \text{parent_education_level}_{ij} + \beta_6 \text{household_income}_{ij} \\
 & + \beta_7 \text{neighbourhooddeprivation}_{ij} + \beta_8 \text{survey_year}_{ij} + \beta_9 \text{exposure} * \text{age}_{ij} \\
 & + \beta_{10} \text{exposure} * \text{migrationbackground}_{ij} + \epsilon_{ij}
 \end{aligned}
 \tag{2}$$

$$\begin{aligned}
 y_{ij} = & \beta_0 + b_{0j} + \beta_1 \text{exposure}_{ij} + \beta_2 \text{age}_{ij} + \beta_3 \text{sex}_{ij} + \beta_4 \text{migrationbackground}_{ij} \\
 & + \beta_5 \text{parenteducationlevel}_{ij} + \beta_6 \text{householdincome}_{ij} \\
 & + \beta_7 \text{neighbourhooddeprivation}_{ij} + \beta_8 \text{surveyyear}_{ij} + \beta_9 \text{exposure} * \text{age}_{ij} \\
 & + \beta_{10} \text{exposure} * \text{parenteducationlevel}_{ij} + \epsilon_{ij}
 \end{aligned}
 \tag{3}$$

$$\begin{aligned}
 y_{ij} = & \beta_0 + b_{0j} + \beta_1 \text{exposure}_{ij} + \beta_2 \text{age}_{ij} + \beta_3 \text{sex}_{ij} + \beta_4 \text{migrationbackground}_{ij} \\
 & + \beta_5 \text{parenteducationlevel}_{ij} + \beta_6 \text{householdincome}_{ij} \\
 & + \beta_7 \text{neighbourhooddeprivation}_{ij} + \beta_8 \text{surveyyear}_{ij} + \beta_9 \text{exposure} * \text{age}_{ij} \\
 & + \beta_{10} \text{exposure} * \text{householdincome}_{ij} + \epsilon_{ij}
 \end{aligned}
 \tag{4}$$

Similar analyses were performed using generalized logistic mixed models with the logit link to estimate the effect of exposure on adherence to fruit/vegetable guidelines over the time.

Youth 12-18 years old

Model specifications were the same for youth 12-18 years old, except that the covariate parental education level was not available. We modelled the effect of exposure to the JOGG approach on logPA and BMIz using linear mixed models, according to:

$$y_{ij} = \beta_0 + b_{0j} + \beta_1 \text{exposure}_{ij} + \beta_2 \text{age}_{ij} + \beta_3 \text{sex}_{ij} + \beta_4 \text{migrationbackground}_{ij} + \beta_5 \text{householdincome}_{ij} + \beta_6 \text{neighbourhooddeprivation}_{ij} + \beta_7 \text{surveyyear}_{ij} + \beta_8 \text{exposure} * \text{age}_{ij} + \epsilon_{ij} \quad 1$$

$$y_{ij} = \beta_0 + b_{0j} + \beta_1 \text{exposure}_{ij} + \beta_2 \text{age}_{ij} + \beta_3 \text{sex}_{ij} + \beta_4 \text{migrationbackground}_{ij} + \beta_5 \text{householdincome}_{ij} + \beta_6 \text{neighbourhooddeprivation}_{ij} + \beta_7 \text{surveyyear}_{ij} + \beta_8 \text{exposure} * \text{age}_{ij} + \beta_9 \text{exposure} * \text{migrationbackground}_{ij} + \epsilon_{ij} \quad 2$$

$$y_{ij} = \beta_0 + b_{0j} + \beta_1 \text{exposure}_{ij} + \beta_2 \text{age}_{ij} + \beta_3 \text{sex}_{ij} + \beta_4 \text{migrationbackground}_{ij} + \beta_5 \text{householdincome}_{ij} + \beta_6 \text{neighbourhooddeprivation}_{ij} + \beta_7 \text{surveyyear}_{ij} + \beta_8 \text{exposure} * \text{age}_{ij} + \beta_9 \text{exposure} * \text{householdincome}_{ij} + \epsilon_{ij} \quad 3$$

Effect estimate II

Using linear mixed models, we modelled the outcomes BMI_z and logPA for individual i in municipality j at the measurement year t (from 2006 to 2019) y_{ijt} . We estimated the effects of the outcome measurement year, $\beta_1 \text{time}$, the effect of JOGG implementation in the municipality j in which individual i lives at the measurement year t , $\beta_2 \text{JOGG}_{ijt}$, and the interaction of the measurement year with the participation in JOGG, $\beta_3 \text{time} * \text{JOGG}_{ijt}$, according to:

$$y_{ijt} = \beta_0 + b_{0j} + \beta_1 \text{time} + \beta_2 \text{JOGG}_{ijt} + \beta_3 \text{time} * \text{JOGG}_{ijt} + \epsilon_{ij}$$

Where $\beta_1 \text{time}$ is the outcome measurement year, $\text{JOGG}_{ijt} = 1$ if municipality j where individual i lives, participates in JOGG at measurement year t and afterwards, (otherwise $\text{JOGG}_{ijt} = 0$), b_{0j} , is the random intercept of the outcome for a municipality j and ϵ_{ijt} is the model residual. The coefficient β_3 is the interaction term between time and JOGG participation and depicts the intervention effect on the outcome.

We tested the parallel trends assumption by comparing the trend of the outcomes before the introduction of JOGG, i.e. with t between 2006 and 2010, in the municipalities that implemented JOGG after 2010 and those who never implemented JOGG, according to:

$$y_{ijf} = \beta_0 + b_{0j} + \beta_1 \text{time} + \beta_2 \text{JOGG}_{ijf} + \beta_3 \text{time} * \text{JOGG}_{ijf} + \epsilon_{ij}$$

where $\text{JOGG}_{ijf} = 1$ if municipality j in which individual i lives introduces JOGG in the future f , sometime after 2010, and $\text{JOGG}_{ijf} = 0$ otherwise.

Similar analyses were performed using generalized linear mixed models with the logit link to estimate the effect of JOGG on adherence to fruit/vegetable guidelines over the time.

S6.2 DISTRIBUTION OF COVARIATES IN NON-JOGG AND (FUTURE) JOGG GROUP OVER TIME

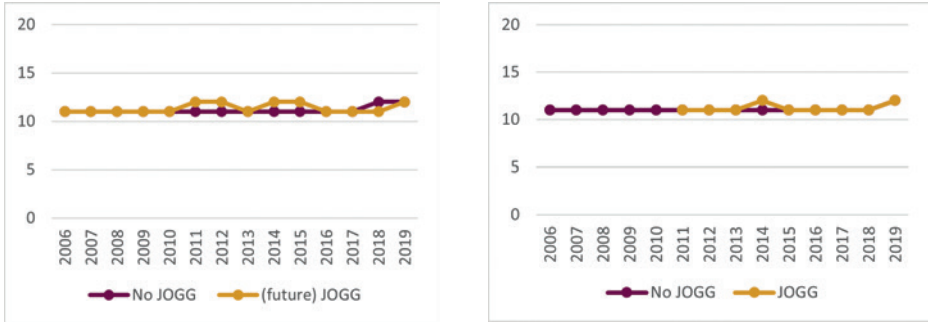


Figure 2A. Mean age of children

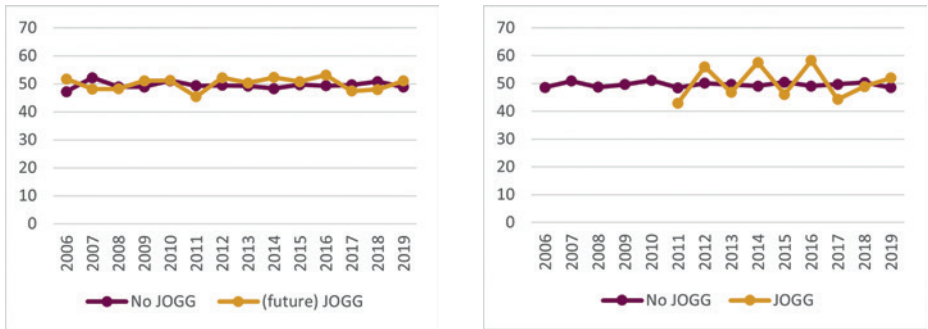


Figure 2B. Percentage of girls

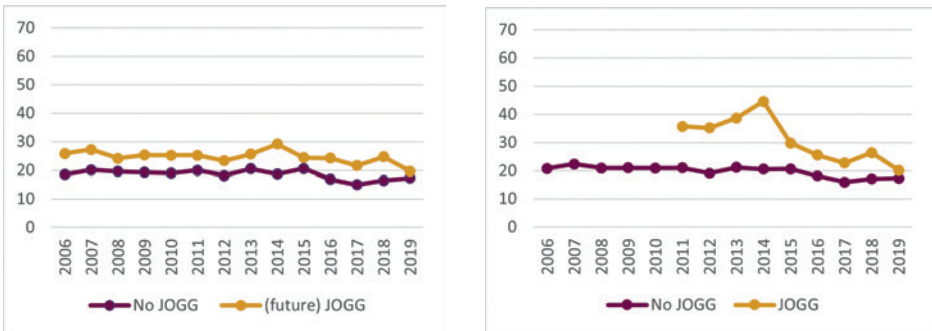


Figure 2C. Percentage of children from the lowest income quartile

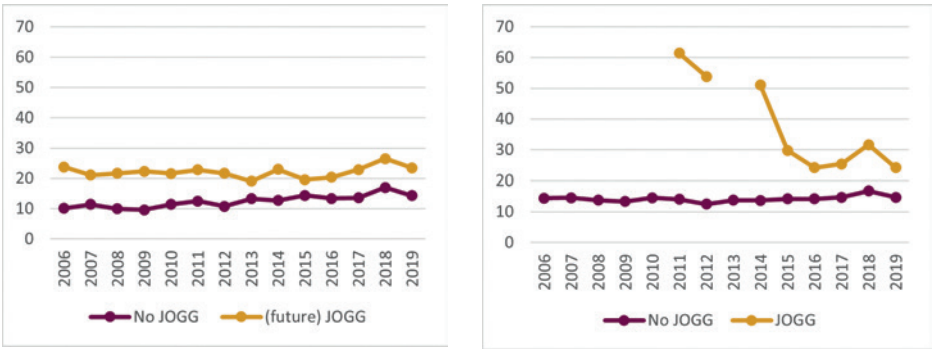


Figure 2D. Percentage of children with a non-western migration background

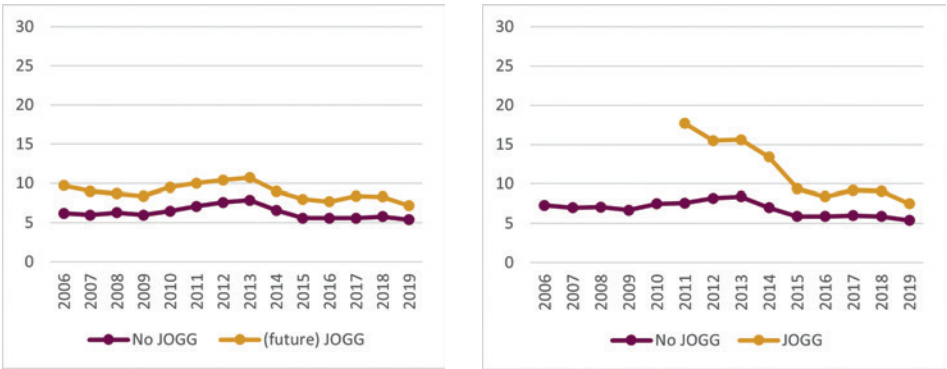
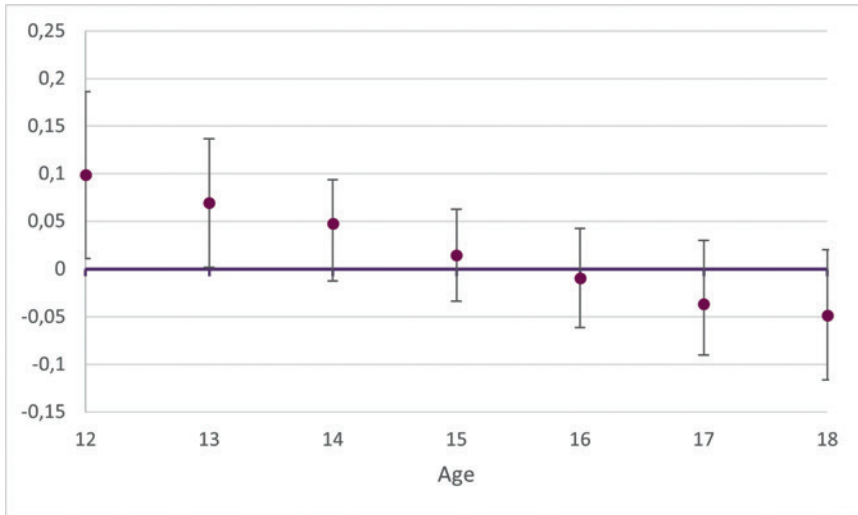


Figure 2E. Mean neighbourhood deprivation

S6.3 RISK DIFFERENCES

Figure 3. difference in the probability of adhering to fruit- and/or vegetable guidelines for children exposed to JOGG for at least 18 months compared to no exposure (inc. 95% CI)



S6.4 STRATIFIED ANALYSIS FOR DIFFERENT INTRODUCTION YEARS

Table 1. Estimates for the difference in intervention outcome trends between JOGG and non-JOGG municipalities for BMIz

Introduction year	Interaction parameter estimates	
	Beta (95% CI)	p-value
2010-2011	-.02 (-.05, .02)	.30
2012-2013	.02 (-.06, .10)	.60
2014-2015	.04 (-.04, .11)	.35
2016-2017	.15 (-.11, .40)	.26
2018-2019	-	

All models were adjusted for the random effect of municipality

Table 2. Estimates for the difference in intervention outcome trends between JOGG and non-JOGG municipalities for logPA

Introduction year	Interaction parameter estimates	
	Beta (95% CI)	p-value
2010-2011	-.01 (-.06, .04)	.69
2012-2013	.09 (.00, .18)	.04
2014-2015	.00 (-.08, .08)	.94
2016-2017	.04 (-.20, .29)	.73
2018-2019	-	

All models were adjusted for the random effect of municipality

Table 3. Estimates for the difference in intervention outcome trends between JOGG and non-JOGG municipalities for adherence to fruit-/vegetable guidelines

Introduction year	Interaction parameter estimates	
	Log-OR (95% CI)	p-value
2010-2011	0.1 (-.12, .13)	.91
2012-2013	-.07 (-.24, .10)	.41
2014-2015	.09 (-.05, .22)	.20
2016-2017	.03 (-.40, .46)	.88
2018-2019	-	

All models were adjusted for the random effect of municipality

^a log odds < 0 indicate a negative effect on the outcome >0 indicate a positive effect on the outcome



Summary

Samenvatting

SUMMARY

Public health problems, such as the increasing prevalence of obesity, sedentary lifestyles and health disparities, are widely recognised as ‘wicked problems’. These problems are driven by numerous interacting social and environmental influences at different levels, which makes them difficult to define and solve. Effectively addressing wicked public health problems requires actions across these levels.

A popular strategy for addressing wicked public health problems are community-based health promotion programmes. These programmes engage a variety of community stakeholders on different levels and in different settings, such as local governments, public institutions (e.g., schools), and private organizations (e.g., food retailers), to collaboratively address the problem. Unlike programs that focus solely on individual behaviour change, community-based programs aim to transform the broader community system in which individuals are embedded. This includes changing public policies and stakeholders practices, the structures through which these are related and norms and values regarding the health problem in the community.

The JOGG approach

This thesis focuses on the evaluation of a widely implemented community-based health promotion programme in the Netherlands, the Healthy Youth, Healthy Future (JOGG) approach. JOGG targets children and youth (0–18 years) and aims to create an environment that promotes healthy dietary behaviours and physical activity, thereby preventing overweight and obesity. As a national organisation, JOGG supports local implementation through training and advice. Local coordinators implement the approach by raising awareness and ownership of the problem in the community and by providing community stakeholders across public and private sectors with the support, skills and resources needed to develop solutions and take collective action. These actions include for example the implementation of healthier sport canteens and school lunches, water drinking policies in childcare, the improvement of outdoor playgrounds and improving intersectoral collaboration in local government and between community organisations regarding child health promotion.

A holistic evaluation

Although community-based programmes are considered promising for sustainable population health promotion, significant gaps in their evidence base remain regarding their effects and working mechanisms. This is primarily due to the evaluation challenges associated with the complexity of the implementation of these programmes. Community-based programmes interact with existing community systems in which they are implemented. This makes each programme unique to its context. In addition, the implementation process is dynamic and adaptive, with programme efforts evolving in response to changing needs, challenges and opportunities in the community and emerging outcomes. Key evaluation challenges include the following:

- There are limitations to evaluations using traditional experimental research designs. A significant limitation is their external validity. These designs do not account for the fact that the effects of community-based programmes result from the interactions between the programmes and the unique context in which they are implemented; which results in varying outcomes and effects of the programme across contexts.
- There is often a narrow focus on individual health outcomes. Therefore emerging outcomes and outcomes regarding the main focus of community-based programmes, to change community systems to promote health, are overlooked.
- Evaluations provide limited insight into the complex process of community-based health promotion. Even though this insight is essential for strengthening causal inferences about the programme's contributions to community change and further programme development.

A more holistic approach to evaluation that integrates various research methods and considers context, emerging and unintended outcomes, and the processes that drive changes in the community system is necessary to address the challenges described above and bridge current gaps in the evidence base.

Aim of this thesis

The main **aim** of the research presented in this thesis was to gain insight into the implementation, working mechanisms, outcomes and impact of the JOGG approach. To consider the complex nature of the JOGG programme, we adopted a holistic evaluation approach. Results may inform further development of the JOGG approach and other community-based programmes.

Because very limited guidance existed on how to take a holistic approach to evaluation at the onset of our study, we developed a research framework and present it in **Chapter 2**. This framework considers the implementation of a community-based programme as a complex adaptive process and highlights how different aspects of it can be evaluated. These aspects include (1) programme theory, (2) adaptation of the programme theory to the local context and available resources, (3) the implementation process, (4) ongoing adaptation of the programme theory and implementation strategy over time, (5) the interaction with context and feedback loops, (6) outcomes (intended, emergent and unintended outcomes) and (7) principles for effectiveness (how the programme contributed to identified outcomes).

Study findings: implementation

Chapter 3 describes the context-dependent and dynamic implementation process of the JOGG approach. In nine Dutch municipalities that implemented JOGG for over a period of five years, we interviewed the implementation teams and conducted document analysis. Our findings revealed that the nine communities underwent six common phases of change during the implementation of JOGG: preparation, initiation of JOGG, upscaling, resource mobilisation, integration with other policy initiatives and adaptation of the implementation strategy. We used an analytical tool called the critical event card to identify key events that influenced the implementation process during each of these phases. Overall, key events included national policy developments (e.g.,

new health programmes), the framing of the JOGG approach in local policies, staff turnover and the coordination teams' experiences and actions. Furthermore, changes in implementation were often triggered by the destabilisation of the implementation process and linked to opportunities for change in the policy process.

Given the importance of implementation teams in the local JOGG approach, **Chapter 4** describes the role and competencies required of local JOGG coordinators. We conducted interviews with 12 local JOGG coordinators and focus groups with advisors from the national JOGG organisation ($n = 8$). The JOGG coordinators appeared to take on a variety of roles throughout the implementation process. To initially engage stakeholders and facilitate collaboration, coordinators took on roles as implementers, project managers, networkers and matchmakers. As implementation progressed, the coordinators became linchpins within the network, politicians and programme managers to mobilise the network of stakeholders. Coordinators required a variety of competencies to successfully fulfil these roles. However, their competencies varied according to available resources, the position of the employing organisation within existing local stakeholder networks, the coordinators' responsibilities within their employing organisation and their professional background. Chapter 4 highlights that, in order to achieve successful implementation, it is crucial to allocate sufficient resources to employ a skilled coordinator and to carefully select the organisation where they are employed.

Study findings: working mechanisms and outcomes

We evaluate the outcomes and working mechanisms of the JOGG approach in **Chapter 5**. As part of five case studies, we conducted ripple effects mapping sessions and interviews with local stakeholders ($n = 50$) to assess the outcomes and impact of the JOGG approach within their communities. After five to nine years of implementation, participants perceived that JOGG had enhanced local stakeholders' ownership of child health promotion, health policies, intersectoral collaboration and social norms towards promoting healthy lifestyles.

Small initial outcomes created the preconditions to enable the achievement of long-term impact. We identified five common working mechanisms through which the JOGG approach contributed to this process: (1) creating a positive connotation with JOGG; (2) mobilising stakeholders to participate in the JOGG approach; (3) facilitating projects to promote knowledge and awareness among stakeholders while creating successful experiences with promoting healthy lifestyles; (4) connecting stakeholders, thereby stimulating intersectoral collaboration; and (5) sharing stakeholders' successes in promoting healthy lifestyles, which gradually established a social norm of participation in health promotion. The specific actions taken to activate these working mechanisms varied significantly across communities.

Chapter 6 describes the JOGG programme's effects on intended individual health outcomes. We used repeated cross-sectional data from the Dutch national health survey (2006–2019) and applied linear mixed models to assess the association between exposure to the JOGG approach and BMI_z, physical activity and adherence to fruit and/or vegetable guidelines. We assessed whether

this association differed across subgroups defined by age, socioeconomic position or migration background. Second, we compared outcome trends in JOGG and non-JOGG municipalities using a difference-in-difference approach, to account for unobserved confounders. The results showed that JOGG potentially contributed to higher fruit and vegetable consumption among youth but showed no association between JOGG exposure and children and youth's weight status or physical activity levels. Associations did not differ across subgroups.

Conclusion

While we found no evidence for the contribution of the JOGG approach to individual health outcomes, the programme was successful in contributing to sustainable community changes that support health promotion, such as improved stakeholder ownership and policy changes towards health promotion. Achieved community changes may not be extensive enough to affect individual-level health outcomes, because many changes did not go beyond health sector stakeholders and policies and because the potential to make large changes was often constrained by factors outside the community (e.g. national policies). More importantly, the scope of the JOGG approach may be too narrow to effectively address the complex problem of childhood overweight, which is driven by a system of interconnected factors that range from individual psychological and biological factors to broader social, cultural and physical environmental factors. Therefore, although community-based programmes have the potential to address the system that drives childhood overweight from the bottom up, they must be supplemented by comprehensive national and international policy actions to effectively address the wicked problem of childhood overweight.

Reflections and implications

Chapter 7 discusses the potential contributions of community-based programmes to wicked problems, provides methodological reflections and recommendations for the evaluation, research and practice of community-based health promotion programmes.

In evaluating JOGG, we encountered the evaluation paradox of wicked problems. Wicked problems, such as the increasing prevalence of childhood overweight in the population, lack definitive solutions and are resistant to change. So, although community based programmes that address such problems, including JOGG, are likely to achieve sustainable changes in the community system, they must be combined with other national and international actions to maximise impact on health outcomes. The paradox is that, although one programme is not enough to solve the wicked problem, policymakers evaluate the effectiveness of a programme based on its potential to solve the problem at hand. This informs their decisions about future funding and continuation. Consequently, simpler individual behaviour change strategies dominate policy, despite the recognised need for a broader focus on the systems that drive health problems. This suggests that policymakers require a different approach to evaluating initiatives that target wicked (health) problems. Instead of focussing on the unrealistic expectation that a single programme can fully solve such complex problems, evaluations should focus on the programmes contributions as part of a broader strategy.

We define several recommendations for evaluating community-based health promotion programmes:

1. Combine different types of research methods to gain a broad view of programme's impact at the community level, including monitoring standardised indicators and evaluating emergent and unintended outcomes.
2. Use proximal and intermediate outcomes to help determine whether intervention efforts are contributing to sustainable changes to the community system, since these changes take a long time to unfold and start with small steps.
3. Integrate continued monitoring and evaluation at the community level into standard programme implementation to assist programme implementers in the adaptive implementation process and support evaluation at the national level.
4. Avoid the use of individual health outcomes as an indicator for programme success. Instead, monitor them as part of the bigger picture and use these results to identify areas that require action and explore the processes at play in these areas.

By adopting a holistic evaluation approach, we accounted for the complex and adaptive nature of the JOGG programme implementation, which enabled us to capture a wider range of outcomes and impacts than would have been possible if we had solely focused on individual health outcomes. Studying the function of JOGG in achieving sustainable changes in different communities allowed us to identify working mechanisms that are applicable across contexts. A limitation of the holistic evaluation approach is its time-intensive nature.

By accumulating evidence from multiple studies and from various research methods, we gradually contribute to a stronger evidence base for community-based health promotion. In the current thesis, we followed a practice-based evidence pathway in which we examined the development and implementation of a programme in real-world settings. Future research could strengthen the evidence base by further unpacking the process of community change and validating current theories on community change in different contexts.

Potential directions for future community-based programmes include recognising and supporting the vital role of implementation teams and focusing on fostering community stakeholders' ownership of health promotion, as this provides the foundation for sustainability. Furthermore, a common pitfall of community-based health promotion is a tendency to focus on low-hanging fruit and quick wins without addressing the underlying causes of health problems. Adopting a systems perspective can help implementers better understand these root causes and identify the most effective points of intervention in the community system.

SAMENVATTING

Volksgesondheidsproblemen, zoals de toenemende prevalentie van obesitas, sedentair gedrag en gezondheidsverschillen, worden algemeen erkend als complexe problemen (wicked problems). Dit soort problemen worden veroorzaakt door een heleboel verschillende, onderling samenhangende, sociale en omgevingsfactoren op verschillende niveaus. Dit maakt deze problemen lastig te definiëren en op te lossen. Het effectief aanpakken van complexe problemen vereist actie op verschillende niveaus.

Een populaire strategie voor het aanpakken van complexe volksgezondheidsproblemen is de zogenoemde ‘community-based’ aanpak. Binnen zo’n aanpak worden relevante lokale stakeholders op verschillende niveaus en binnen verschillende settings – zoals gemeentelijk beleidsmedewerkers, publieke partijen (bijv. scholen) en private partijen (bijv. supermarkten) – betrokken om gezamenlijk het probleem aan te pakken. In tegenstelling tot programma’s die zich enkel richten op gedragsverandering bij individuen, streven community-based programma’s ernaar het bredere systeem waar individuen onderdeel zijn te veranderen. Het gaat dan onder andere om het veranderen van het beleid en dagelijkse werkwijze van overheden en organisaties, de structuren waarin zij functioneren, en de heersende normen en waarden over het gezondheidsprobleem.

De JOGG-aanpak

Dit proefschrift richt zich op de evaluatie van een in Nederland breed geïmplementeerde community-based programma: de Gezonde jeugd, Gezonde toekomst (JOGG)-aanpak. JOGG richt zich op kinderen en jongeren (0–18 jaar) en streeft ernaar een omgeving te realiseren die gezonde voeding en bewegen stimuleert, om zo overgewicht en obesitas te voorkomen. De landelijke JOGG organisatie ondersteunt de lokale uitvoering van de JOGG-aanpak door middel van training en advies. Lokale JOGG-regisseurs implementeren de aanpak. Zij bevorderen bewustwording en eigenaarschap voor een gezonde leefomgeving in de gemeente. Daarnaast adviseren en ondersteunen JOGG-regisseurs publieke en private partijen om gezamenlijke oplossingen te ontwikkelen en actie te ondernemen. Acties die daaruit voortkomen zijn bijvoorbeeld de invoering van gezondere sportkantines en schoollunches, beleid voor water drinken in de kinderopvang, de verbetering van buitenspeelplekken en de versterking van intersectorale samenwerking tussen gemeentelijke beleidsdomeinen en uitvoeringsorganisaties om de leefomgeving van kinderen en jongeren gezond in te richten.

Een holistische evaluatie

Hoewel community-based programma’s veelbelovend zijn voor duurzame bevordering van de volksgezondheid, is er nog veel onbekend over de effecten en werkingsmechanismen van deze programma’s. Dit komt door de complexiteit van de implementatie van deze programma’s. Community-based programma’s spelen altijd in op de context waarin deze worden geïmplementeerd, waardoor elke lokale aanpak uniek is. Daarnaast is de implementatie ervan dynamisch en adaptief. Dat betekent dat het programma over de tijd heen verandert, in reactie op

veranderende behoeften, uitdagingen, kansen en opbrengsten in de gemeente. Deze complexiteit heeft verschillende uitdagingen bij de evaluatie van deze programma's als gevolg:

- Traditionele evaluatiedesigns hebben beperkingen. Een belangrijke beperking is hun externe validiteit. Deze designs houden geen rekening met het feit dat de effecten van community-based programma's voortkomen uit de wisselwerking tussen het programma en de context waarin deze wordt geïmplementeerd, wat leidt tot unieke opbrengsten in elke context.
- Er is vaak een te beperkte focus op individuele gezondheidsuitkomsten. Hierdoor worden onvoorziene opbrengsten en de directe opbrengsten van community-based programma's – namelijk het veranderen van systemen om gezondheid te bevorderen – vaak over het hoofd gezien.
- Huidige evaluaties bieden beperkt inzicht in het complexe proces van community-based gezondheidsbevordering. Terwijl dit inzicht juist essentieel is om de bijdrage van het programma aan veranderingen in het lokale systeem in kaart te brengen en doorontwikkeling van het programma te ondersteunen.

Om deze uitdagingen aan te pakken en de huidige gaten in de wetenschappelijke onderbouwing te dichten, is een meer holistische benadering van de evaluatie nodig. In zo'n holistische evaluatie worden onderzoeksmethoden geïntegreerd en wordt rekening gehouden met de context, onvoorziene opbrengsten, en de processen die veranderingen in het systeem teweegbrengen.

Doel van dit proefschrift

Het hoofddoel van het onderzoek in dit proefschrift was om inzicht te krijgen in de implementatie, werkingsmechanismen, opbrengsten en impact van de JOGG-aanpak. Gezien de complexe aard van de JOGG-aanpak hebben we een holistische evaluatiebenadering toegepast. De resultaten van het onderzoek dragen bij aan de verdere ontwikkeling van de JOGG-aanpak en andere community-based programma's.

Omdat er bij aanvang van ons onderzoek weinig richtlijnen bestonden over hoe een holistische evaluatiebenadering toegepast kon worden hebben we een onderzoeksframework ontwikkeld, dat we presenteren in **hoofdstuk 2**. Dit framework beschouwt de implementatie van een community-based programma als een complex en adaptief proces en laat zien welke aspecten van dit proces geëvalueerd kunnen worden. Deze aspecten zijn: (1) De programmatheorie: onderliggende aannames over hoe het programma werkt, (2) aanpassing van deze programmatheorie aan de lokale context en beschikbare middelen, (3) het implementatieproces: hoe het programma in de praktijk wordt uitgevoerd, (4) de continue aanpassingen aan de programmatheorie en implementatiestrategie gedurende de uitvoering van het programma, (5) de interactie met de context en feedback loops, (6) opbrengsten: beoogde, onvoorziene en onbedoelde opbrengsten, (7) werkingsmechanismen: de manier waarop het programma bijdraagt aan de opbrengsten.

Resultaten: implementatie

In **hoofdstuk 3** wordt het contextafhankelijke en dynamische implementatieproces van de JOGG-aanpak beschreven. In negen Nederlandse gemeenten die de JOGG-aanpak al minimaal vijf jaar implementeerden, interviewden we de implementatieteams en voerden we documentanalyses uit. De resultaten laten zien dat de negen gemeenten tijdens de implementatie van de JOGG-aanpak zes gemeenschappelijke fasen van verandering doorliepen: voorbereiding, start JOGG-aanpak, uitbreiden, meer/minder middelen, integratie met beleid, verandering van de werkwijze. We gebruikten de analysetool '*critical event card*' om sleutelmomenten in het implementatieproces in elk van deze fasen van verandering te identificeren. Belangrijke sleutelmomenten bleken onder andere nationale beleidsontwikkelingen (bijv. nieuwe gezondheidsprogramma's), de positionering van de JOGG-aanpak binnen lokaal beleid, personeelwisselingen en de ervaringen en acties van de implementatieteams. Daarnaast zagen we dat veranderingen in de implementatie van het programma vaak in gang werden gezet door onverwachte kansen of belemmeringen en waren deze gerelateerd aan de timing: momenten binnen de beleidscyclus waarop verandering mogelijk is.

Omdat de implementatieteams essentieel zijn voor de uitvoering van de JOGG-aanpak, gaan we in **hoofdstuk 4** dieper in op de rol van lokale JOGG-regisseurs en de competenties die zij nodig hebben. We interviewden 12 JOGG-regisseurs en hielden focusgroepen met adviseurs van de landelijke JOGG-organisatie ($n = 8$). Uit ons onderzoek bleek dat JOGG-regisseurs in de implementatie verschillende rollen vervulden. In de beginfase, om stakeholders te betrekken en samenwerking te faciliteren, namen zij de rol aan van uitvoerder, projectmanager, netwerker en makelaar. Naarmate de JOGG-aanpak vorderde, namen zij de rol aan van coördinator, politicus en programmamanager, om het netwerk te mobiliseren. Om al deze rollen succesvol te vervullen, bleken regisseurs diverse competenties nodig te hebben. Welke competenties een regisseur nodig heeft veranderde over de tijd. Maar de competenties van de regisseurs werden beïnvloed door de beschikbare middelen, de positie van hun werkgever binnen het bestaande lokale netwerk, de functie van de regisseur binnen de organisatie waar zij werkzaam waren en hun professionele achtergrond. De resultaten benadrukken dat om de implementatie succesvol te laten verlopen het belangrijk is om voldoende middelen te hebben om een vaardig implementatieteam in dienst te nemen en zorgvuldig te bepalen bij welke organisatie dit team wordt gepositioneerd.

Resultaten: werkzame mechanismen en opbrengsten

In **Hoofdstuk 5** evalueren we de opbrengsten en werkingsmechanismen van de JOGG-aanpak. Als onderdeel van vijf casestudies voerden we *ripple effects mapping* sessies en interviews uit met lokale stakeholders ($n = 50$). Daarin brachten we de opbrengsten en impact van de JOGG-aanpak binnen de gemeente in kaart. Na vijf tot negen jaar implementatie gaven deelnemers aan dat JOGG had bijgedragen aan eigenaarschap bij lokale stakeholders om de leefomgeving van kinderen en jongeren gezonder te maken, de invoering van beleid om gezonde keuzes te stimuleren en verbeterde intersectorale samenwerking en sociale normen gericht op een gezonde leefomgeving.

Directe korte-termijn opbrengsten vormden de eerste stappen die samen bijdroegen aan impact op de lange termijn. We identificeerden vijf werkingsmechanismen waarmee de JOGG-aanpak

aan dit proces bijdroeg: (1) een positieve associatie met JOGG creëren, (2) stakeholders stimuleren om deel te nemen aan de JOGG-aanpak, (3) projecten faciliteren die kennis en bewustwording onder stakeholders bevorderden en zorgen voor een succeservaring, (4) stakeholders met elkaar verbinden, waardoor intersectorale samenwerking werd gestimuleerd, (5) successen van stakeholders delen, waardoor de norm om bij te dragen aan een gezonde leefstijl steeds sterker werd. De specifieke acties die werden ondernomen om deze werkingsmechanismen te activeren verschilden aanzienlijk tussen gemeenten.

In **hoofdstuk 6** onderzochten we de bijdrage van de JOGG-aanpak aan beoogde individuele gezondheidsuitkomsten. We gebruikten herhaalde cross-sectionele data uit de nationale gezondheidsenquête (2006–2019) en pasten lineaire mixed models toe om de associatie te tussen blootstelling aan de JOGG-aanpak en BMIz, bewegen en naleving van de richtlijnen voor fruit- en/of groenteconsumptie te analyseren. En we onderzochten of deze associatie verschildte tussen subgroepen op basis van leeftijd, sociaaleconomische positie of migratieachtergrond. Daarnaast vergeleken we trends in uitkomsten tussen JOGG- en niet-JOGG-gemeenten met behulp van een *difference-in-difference*-benadering, om rekening te houden met niet-geobserveerde verstovende variabelen. De resultaten toonden aan dat JOGG mogelijk heeft bijgedragen aan een hogere fruit- en groenteconsumptie onder jongeren, maar er werd geen associatie gevonden tussen blootstelling aan JOGG en gewicht of bewegen van kinderen en jongeren. De associaties verschilden niet tussen de subgroepen.

Conclusie

De JOGG-aanpak bleek niet bij te dragen aan het voorkomen van overgewicht of een gezondere leefstijl bij kinderen en jongeren. Wel droeg de aanpak bij aan duurzame, gezondheid bevorderende, veranderingen binnen de gemeente. Deze veranderingen waren mogelijk onvoldoende om gezondheidsuitkomsten op individueel niveau te realiseren, omdat veranderingen op binnen de gemeente beperkt waren tot stakeholders voor wie een gezonde leefomgeving past bij hun ambities, zoals scholen of een beleidsmedewerker sport. Daarnaast werden mogelijkheden tot verandering beperkt door factoren buiten het gemeentesysteem. Belangrijker nog, de JOGG-aanpak is mogelijk te smal om het complexe probleem van overgewicht bij kinderen effectief aan te pakken. Dit probleem wordt veroorzaakt door een systeem van onderling verbonden factoren, variërend van individuele psychologische en biologische factoren tot bredere sociale, culturele en fysieke omgevingsfactoren. Community-based programma's leveren een belangrijke bijdrage om het systeem wat overgewicht bij kinderen in stand houdt van onderaf aan te pakken. Maar aanvullende nationale en internationale (beleids-)maatregelen zijn nodig om dit complexe probleem effectief aan te pakken. Onderkant formulier

Reflecties en implicaties

In hoofdstuk 7 bediscussiëren we de mogelijke bijdrage van community-based programma's aan complexe problemen, reflecteren we op de toegepaste methoden en doen we aanbevelingen voor de evaluatie, onderzoek en praktijk van community-based programma's.

In de evaluatie van JOGG liepen we tegen de 'evaluatie paradox' van complexe problemen aan. Complexe problemen, zoals de toename van overgewicht bij kinderen in de populatie, hebben geen definitieve oplossingen en zijn moeilijk te veranderen. Hoewel community-based programma's zoals JOGG duurzame veranderingen in het systeem teweeg kunnen brengen, moeten ze worden gecombineerd met andere nationale en internationale acties om daadwerkelijk impact te hebben op gezondheidsuitkomsten. De paradox is dat, hoewel één programma niet voldoende is om het complexe probleem op te lossen, beleidsmakers de effectiviteit van een programma beoordelen op basis van hun vermogen om het probleem op te lossen. Beslissingen over toekomstige financiering en voortzetting hangen hier vervolgens vanaf. Daardoor domineren eenvoudigere strategieën gericht op individueel gedragsverandering de beleidsagenda, ondanks de erkende noodzaak van een bredere focus op de systemen die gezondheidsproblemen in stand houden.

Beleidsmakers hebben daarom een andere benadering nodig om initiatieven die zich richten op complexe problemen te evalueren. In plaats van hun beslissingen te baseren op de onrealistische verwachting dat één enkel programma complexe problemen volledig kan oplossen, moeten evaluaties zich richten op de bijdrage van het programma binnen een bredere strategie. We formuleren een aantal aanbevelingen voor het evalueren van community-based programma's:

1. Het combineren van verschillende onderzoeksmethoden om een breed beeld te krijgen van de impact van het programma op gemeenteniveau, inclusief het monitoren van vaste indicatoren en het evalueren van onverwachte en onbedoelde uitkomsten.
2. Het monitoren van tussenopbrengsten om te bepalen of inspanningen bijdragen aan duurzame veranderingen in het systeem, omdat veranderingen lang duren en met kleine stappen beginnen.
3. Continue monitoring en evaluatie op gemeenteniveau een vast onderdeel van het programma maken. Dit ondersteunt het lokale implementatieproces en kan evaluatie op landelijk niveau bevorderen.
4. Het niet gebruiken van individuele gezondheidsuitkomsten als maatstaf voor het succes van een programma. In plaats daarvan kunnen deze uitkomsten worden gemonitord als onderdeel van het programma, om aandachtsgebieden te identificeren en verder te onderzoeken wat er in deze gebieden speelt.

Door een holistische evaluatiebenadering toe te passen, hebben we rekening gehouden met de complexe en adaptieve aard van de JOGG-aanpak. Daardoor konden we een breder scala aan opbrengsten in kaart brengen dan mogelijk zou dan als we alléén zouden focussen op individuele gezondheidsuitkomsten. Door anders te kijken naar de generaliseerbaarheid van resultaten, konden we werkzame mechanismen identificeren die toepasbaar zijn in verschillende contexten. Een beperking van de holistische evaluatie benadering is dat deze veel tijd kost. Dit onderstreept het belang van continue monitoring op lokaal niveau.

Door resultaten te verzamelen uit meerdere studies en verschillende onderzoeksmethoden, kunnen we community-based programma's voor gezondheidsbevordering geleidelijk steeds beter

wetenschappelijk onderbouwen. In dit proefschrift hebben we een praktijkgerichte benadering gevolgd, waarbij we de ontwikkeling en implementatie van een programma in de praktijk hebben onderzocht. Toekomstig onderzoek kan de onderbouwing versterken door het proces van verandering verder te ontleden en bestaande theorieën daarover in verschillende contexten te valideren.

Aanbevelingen voor toekomstige community-based programma's zijn het erkennen en ondersteunen van de cruciale rol van implementatieteams en het bevorderen van eigenaarschap voor een gezonde leefomgeving bij stakeholders in de gemeente, de basis voor duurzame systeemverandering. Een veelvoorkomende valkuil bij community-based gezondheidsbevordering is de neiging om zich enkel te richten op laaghangend fruit en snelle successen, zonder de onderliggende oorzaken van gezondheidsproblemen aan te pakken. Het toepassen van systeemdenken kan uitvoerders helpen onderliggende oorzaken beter te begrijpen en de meest effectieve aangrijpingspunten voor systeemverandering te identificeren.



About the author

Portfolio

List of publications

ABOUT THE AUTHOR

Irma was born in Oss, The Netherlands, on August 21, 1995. She conducted her secondary education at the Mondriaan college in Oss. Followed by one year of teacher training and a three year bachelor programme in pedagogical science at Radboud University. After earning her degree in 2016, she conducted a master programme in educational science, graduating in 2017.

Following this master programme Irma worked as a scientific researcher at the Dutch inspectorate of education for a year. In 2018 she started her second masters degree in Sociology at Radboud University, which she earned in 2019.

Irma started her PhD in January 2020, at the department of Public and Occupational Health at Amsterdam UMC and the Mulier Institute in Utrecht, an independent research institute focused on sports and physical activity. In addition to conducting her PhD research, Irma contributed to several research projects at the Mulier Institute. Her research findings were published in academic journals and presented at several international conferences. In the last years of her PhD she worked with JOGG to translate study findings for practice and support programme development at the national level and local monitoring and evaluation practices.

Since finishing up her PhD work in 2024, Irma is more actively involved in various research projects at the Mulier Institute. Her work mainly focuses on the monitoring and evaluation of health policy programme's and outdoor play.



PHD PORTFOLIO

Name	Date achieved	EC
External courses		
Writing a Scientific Article	22-12-2020	3.00
Qualitative research methods	23-06-2021	0.64
Project management	25-02-2022	0.57
Peer-to-peer group coaching	16-03-2022	0.36
Presenting and pitching your research in English	31-01-2023	2.00
GNK – AMS – mandatory – Scientific integrity	29-03-2023	2.00
Philosophy of Science	23-06-2023	0.14
Process tracing methods	30-06-2023	6.00
Community Engaged Scholarship	30-05-2024	0.71
Systems thinking in public health	01-11-2024	0.50
Research related		
APH spring sessions	16-04-2021	0.25
ISBNPA 2022	21-05-2022	2.00
PhD video workshop	15-11-2022	0.18
Poster design	09-05-2023	0.11
Systems evaluation network meetings	09-06-2023	0.29
HEPA 2023	13-09-2023	2.00
Regular research meeting and internal training Mulier Instituut	31-12-2023	2.39
ISPAH 2024	31-10-2024	2.00
Other academic activities		
Annual CaRe days	27-05-2021	1.00
Realist evaluation	08-03-2022	0.43
Teaching/Student supervision		
Stagebegeleider masterstudent	15-07-2022	1.00
Tutor course Exercise and Health	03-02-2023	0.50
Stagebegeleider masterstudent	06-02-2023	1.00
Begeleider Kennismaking Wetenschappelijk Onderzoek	31-05-2023	1.00
Total number of ECTS credits		30.07

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ISPAH Congress 2024, Parijs, Frankrijk

Oral presentation: Uncovering the key working mechanisms of a complex community-based prevention programme using ripple effects mapping

HEPA Europe conference 2023, Leuven, België

Oral presentation: Implementation of the JOGG approach (Healthy Youth, Healthy Future): unpacking the complex implementation process of community-based health promotion using the Critical Event Card

The International Society of Behavioral Nutrition and Physical Activity (ISBNPA) meeting 2022, Phoenix, Arizona, USA

Oral presentation: Evaluating community-based programmes for health promotion: a novel approach considering the complexity perspective

CaRe Days 2021

Oral presentation: Capturing the dynamics of community-based health promotion: evaluating the JOGG (Youth at a Healthy Weight) approach



Dankwoord

DANKWOORD

Sinds ik ben begonnen aan dit onderzoek zijn er bijna vijf jaar voorbij gegaan. En het voelt heel kort geleden dat ik begon. Maar tegelijkertijd ook heel lang, want in die vijf jaar is er zoveel gedaan en gebeurd. En er is dan ook heel veel om dankbaar voor te zijn.

Promotieteam

Allereerst heel veel dank aan mijn promotieteam, die me door de afgelopen jaren heen hebben geholpen. *Mai* en *Frank*, bedankt voor al jullie betrokkenheid de afgelopen jaren. Voor jullie hulp en aanmoediging wanneer ik het nodig had, en ook als ik het eigenlijk niet nodig had maar alleen 'even wilde toetsen' of mijn ideeën of plannen niet heel gek waren. Fijn dat jullie altijd alsnog tijd maakten en luisterden! *Mai*, ik was de afgelopen jaren niet als een van de vaste collega's op vumc te vinden, maar toch heb ik altijd het gevoel dat ik niet vergeten wordt. Het belangrijke 'less is more' heb ik heel hard nodig en het lukt nog steeds niet altijd, maar ooit kom ik er! *Frank*, bedankt voor het meedenken in alle complexe vraagstukken rondom dit onderzoek. Ik vind dat je die altijd zo goed kunt duiden en uitleggen, en ik heb daar heel veel van geleerd.

Amika en *Dorine*, aan jullie heb ik het meeste te danken. Zonder jullie was dit onderzoek natuurlijk überhaupt niet gestart en was ik niet bij Mulier Instituut terecht gekomen. Maar bij jullie ben ik ook echt in een warm bad terecht gekomen. *Dorine*, bij jou kon ik altijd terecht. Voor grote dingen, kleine dingen, even klagen, even sparren, even meelezen, even checken hoe het gaat. Zelfs toen je een nieuwe baan kreeg bleef je nog even om het onderzoek goed mee af te ronden, en maak je ook nu nog in de laatste fase tijd voor mij. En dat laat alleen maar zien hoe sociaal en betrokken jij bent. Als ik later groot ben wil ik net zo worden als jij! *Amika*, wij zijn precies anders. Jij de doener en ik de denker. Jij rood en ik blauw (of zoiets...). Maar sluit juist perfect op elkaar aan toch? Ik ben altijd een beetje jaloers op jouw kracht, jouw netwerk skills, jouw ambitie en activisme voor het onderzoek waar je je mee bezig houdt. En ik heb het gevoel dat ik altijd van jou kan blijven leren. Ik ben blij dat onze samenwerking niet bij JOGG ophoudt en we ook weer nieuwe dingen samen doen. Ik wil jullie allebei bedanken dat jullie altijd zo met me mee dachten, me mijn eigen weg lieten zoeken, maar me ook hielpen met keuzes maken en me altijd aanmoedigden. Dankjewel dat we het elke keer gingen vieren als er weer een artikel/rapport gepubliceerd was. Terug kijkend is dat echt zó belangrijk en fijn. En dat was ook nog eens heel gezellig! Duizend maal dank.

Collega's

Bedankt alle lieve collega's bij het MI die het zo'n fijne werkplek maakten de afgelopen jaren. Ook al deed ik soms net ander werk dan jullie, ik heb me altijd net zoveel onderdeel gevoeld van het MI. In het bijzonder wil ik alle oude en nieuwe collega's binnen team gezondheid en team leren bewegen bedanken met wie ik de afgelopen jaren zou fijn samen heb gewerkt: *Tessa, Linda, Denise, Robin, Marthe, Sofie, Maaike, Eef, Sanne, Lisa, Elien, Dagmar, Anouschka, Mirjam, Jorien, Kirsten, Vicky, Suzan, Maxine, Mara, Lisanne, Wikke*. En *Nina, Mark, Janne, Marloes*, mijn partners in crime op JOGG projecten de afgelopen jaren.

Mirjam, bedankt voor de fijne buddymomenten en wandelingen de afgelopen jaren. Het is altijd fijn om even bij jou te ventileren. En jouw objectieve kijk en ervaringen hebben mij enorm geholpen om alles wat meer in perspectief te zien, en ietsje minder perfectionistisch te zijn.

Elien, als jouw buddy hoop ik jou te behoeden voor alle valkuilen waar ik de afgelopen jaren al lang en breed ben ingetrapt (iets met drukte, onhaalbare to-do lijstjes, productive procrastination, teveel werken, te perfectionistisch zijn etc. etc.). Ik heb het gevoel dat je veel op mij lijkt daarin, dus dat gaat vast niet helemaal lukken. Maar uit ervaring weet ik nu écht: het komt goed, en je komt er wel!

Marloes, als nieuwe teamtrekker van gezondheid werkten we de afgelopen jaren regelmatig samen. Jij was niet mijn buddy, maar ik tóch had ik het gevoel dat ik altijd bij jou terecht kon en even van je wijsheid gebruik kon maken. Van alle projecten die we samen deden wist ik zeker dat alles goed kwam. En ik heb veel geleerd van de nuchtere manier waarop jij alle projecten aanpakt. Ik wil toch nóg een keer zeggen als collega ga missen.

Tessa, met jou ben ik de afgelopen jaren heel veel gaan samenwerken. En daar ben ik heel blij mee. Dankjewel voor alle flexibiliteit afgelopen jaar als ik het weer even druk had. Als we iets samen doen ben ik er altijd gerust op dat het wel goed komt. Met jouw precisie, kritische blik en kennis over buitenspelen ben je een echte onderzoeker, en voor mij een belangrijke expert op buitenspelen. En ik hoop dat je dat zelf ook zo ervaart, en de komende jaren nog veel verder kunt opbouwen.

Jorien, jij was de allereerste die me wegwijs maakte binnen de JOGG-aanpak. Ik denk dat dat zelfs al op mijn eerste werkdag was. Ik ben eigenlijk zelfs een beetje in jouw voetstappen gevolgd als het gaat over JOGG en buitenspelen. We hebben natuurlijk samen een van de delen uit dit onderzoek uitgevoerd. Het was altijd superfijn samenwerken met jou, en ik vind het eigenlijk nog steeds heel jammer dat we geen collega's meer zijn!

Mara, ik heb altijd zo fijn met jou samengewerkt, en ik had mij geen betere onderzoeksassistent kunnen wensen. Dankjewel voor alle uren die je hebt besteed aan het luisteren naar mijn stem tijdens het uittypen van alle interviews. Dankjewel voor het meeschrijven, de tekstcontroles, het opmaken van documenten, meedenken in de analyses, het (mee) afnemen van interviews en alle andere rotklusjes die je zonder klagen van me aannam en perfect uitvoerde. Zonder jou had ik dit zeker niet gekund!

Dankjewel *Bloem* en *Jennifer*, wat een fijne stagiaires waren jullie. Dankjewel voor al jullie hulp! *Vieve*, wat fijn dat jij dit hele jaar bij ons werkt. Bedankt voor jouw flexibiliteit en interesse de afgelopen maanden!

Dankjewel *Remco*, *Hugo* en *Agnes*, dat ik de kans heb gekregen om mijn PhD bij het Mulier Instituut te doen en te kunnen combineren van andere onderzoeken en dat jullie mij de afgelopen jaren de ruimte hebben gegeven om mijn promotie tot een goed einde te kunnen brengen.

Héél veel dank aan *alle lieve CAPHRI collega's* bij vumc. Het is zo fijn om ook een werkplek te hebben waar iedereen bezig is met wetenschappelijk onderzoek. Met data verzamelen, publiceren en promoveren, en alles waar je daarbij tegenaan loopt. En waar het óók nog eens gezellig is. Dankjewel!!!

Voor een aantal onderdelen van mijn onderzoek heb ik ook even buiten MI en vumc mogen samenwerken. *Sanne*, het is al best een tijdje geleden (2021/2022?) dat we samen aan de participatieve evaluatietool voor de gezonde omgeving werkten. Hoewel dit niet allemaal even soepel ging en ons deel uiteindelijk helaas niet in mijn proefschrift is beland, heb ik wel heel veel van jou en van dat proces geleerd en hebben we het uiteindelijk toch af kunnen sluiten met een artikel in TSG over wat er allemaal mis ging en de geleerde lessen. Onze tool is helaas uiteindelijk nooit helemaal uit de pilotfase is gekomen, toch gebruik ik hem nog steeds als inspiratie bij nieuwe projecten. Dankjewel, het was het heel fijn om met jou hierop samen te werken. *Famke*, dankjewel voor het meedenken over de ingewikkelde vraagstukken in ons onderzoek en de kwantitatieve analyses. En mag ik dit moment ook even nemen om te zeggen dat je altijd hele fijne en bruikbare feedback geeft? Zo fijn! *Ehsan*, zonder jouw statistische kennis was hoofdstuk 6 vast niet zo precies geweest, dankjewel!

Ten slotte wil iedereen bij JOGG bedanken met wie ik de afgelopen jaren heb samengewerkt, om dit onderzoek tot een goede uitvoer te kunnen brengen en de resultaten ervan verder te verspreiden: *Bente, Mieke, Suzanne, Melissa, Jordi, Jort* en alle anderen. Ik heb dit altijd als een fijne samenwerking ervaren. En ik vind het zo leuk dat jullie nu ook echt verder kunnen en gaan met onze resultaten. Ook wil ik alle lokale JOGG teams bedanken die aan dit onderzoek hebben meegewerkt. Zonder jullie was dit onderzoek niet mogelijk geweest.

Familie en vrienden

Allereerst, de belangrijkste weekend afleiding van de afgelopen jaren. Bedankt voor alle etentjes, wijnavonden, BBQ's, bowlavonden, spelletjesavonden, feestjes, ski tripjes en meer, *Noëll, Kaylee, Roel, Lisanne* (en *Lizzy*), *Tom, Alieke, Rick, Annicky, Teun*. De afgelopen vijf jaar zijn we allemaal (oké behalve ik als jong bloempje dan) dertigers geworden, en ik vind het zo leuk om ons steeds een beetje meer volwassen te zien worden. Laten we die gezellige momenten nog lang blijven doen!

Een andere belangrijke afleiding was badmintonclub *Level* in Oss. Een plek waar ik heel graag kom. Niet alleen omdat badminton zo leuk is, maar ook vanwege alle gezellige mensen die elke week komen een feestje maken. Bedankt allemaal daarvoor!

Opa en Oma 'Lithoijen', bedankt voor al jullie aanmoediging en jullie interesse de afgelopen jaren. Ben ik nu docterandus, of doctor, en is dat dan hetzelfde als een PhD? Ik weet het nog steeds niet. Maar ik weet wel dat ik heel trots ben dat dit boekje bij jullie in de kast mag staan, en ik nu jullie hoog geleerde kleindochter mag zijn.

Lieve *Oma* 'blik'. Je woont wat verder weg, wat helaas betekent dat we elkaar niet wekelijks zien. Maar ik ben zo blij dat je elke maand wel eens naar ons toe komt. Wat fijn dat je nog zó fit en gezond bent. En dat we daardoor zoveel samen, en met de rest van de familie, hebben kunnen ondernemen. Ik hoop dat we dat nog lang kunnen blijven doen. Want het is altijd gezellig als jij erbij bent.

Mijn tweede familie, *José, Peter, Anne*, en later *Bernou*. Ik ken jullie al mijn hele volwassen leven. Het is van onschatbare waarde om een tweede familie en tweede thuis te hebben, die zo fijn is als bij jullie. Bedankt dat jullie ook de afgelopen jaren mijn cheerleaders waren. Bedankt voor al jullie interesse, zorg en gezelligheid. Voor alle leuke weekendjes/vakanties, etentjes en al het andere samen zijn. Ik hoop dat we dat nog heel lang mogen doen.

Lieve *papa en mama*, ik weet eigenlijk niet waar ik moet beginnen. Ik denk dat ik de hele pagina wel vol zou kunnen schrijven. Maar laat ik toch een keuze maken. Dankjewel dat jullie altijd achter me staan. Dat jullie me altijd gestimuleerd hebben om te doen wat ik leuk vind en me mijn eigen weg hebben laten volgen. Ook als dat niet altijd logisch was. Bedankt dat jullie me altijd eigenwijs laten zijn en mijn eigen fouten laten maken, al dan niet zonder me daar achteraf oneindig mee te plagen ;). Dankjewel dat ik bij jullie altijd een thuis heb. Dankjewel voor alles.

Mijn liefste zusjes, ik weet nog goed hoe we in onze middelbare school periode avonden en weekenden samen aan de eettafel zaten te leren. *Anne* ik denk dat jij altijd nog veel harder werkte dan ik. En ik blij dat we stiekem nog een beetje hetzelfde doen en nu gewoon gezamenlijke klaagmomentjes in de trein kunnen doen en ik ben blij dat jij naast mij staat tijdens mijn verdediging. Ik kan niet wachten onszelf allebei dr. kunnen noemen. *Marije*, ik weet zeker dat jij altijd minder vaak aan die huiswerktafel te vinden was. Maar daar ben ik eigenlijk wel een beetje jaloers op. Met hoe attent en sociaal jij als persoon bent, ben jij een voorbeeld voor mij. Tegenwoordig zitten we niet meer elke avond met z'n drieën aan die tafel, en zien we elkaar niet meer elke dag of zelfs elke week. Maar dat maakt helemaal niet uit. Als we samen zijn is alles nog hetzelfde en ik weet zeker dat die band nooit weg zal gaan. *Dick en Jeroen*, ik ben blij dat jullie tegenwoordig ook onderdeel van de familie zijn, en dat jullie zo goed voor mijn kleine zusjes zorgen. Dankjewel voor al jullie support.

Credits naar onze lieve poes *Kees*, die me de afgelopen twee jaar de nodige mentale support bood door de hele dag naast mij te slapen terwijl ik hard aan het werk was.

Lieve *Joost*, ik denk dat dit proefschrift er zonder jou niet had gelegen. Jij was er altijd als het even tegenzat, en ook niet onbelangrijk, als er successen gevierd moesten worden. Jij helpt me relativiseren, minder streng voor mezelf te zijn en af en toe ook gewoon te relaxen en te genieten van het leven. Nadat we tijdens de coronaperiode weken lang samen thuis werkten en leefden op de kleine 40 vierkante meter, en het nog gezellig was ook, wist is zeker dat het altijd goed komt als jij er ook bent. Dankjewel voor alles, en nog meer. Ik kan niet wachten op de volgende avonturen samen met jou.

I said remember this moment
In the back of my mind
The time we stood with our shaking hands
The crowds in stands went wild
We were the kings and the queens
And they read off our names
The night you danced like you knew our lives
Would never be the same
You held your head like a hero
On a history book page
It was the end of an era
But the start of an age
Long live the walls we crashed through
How the kingdom lights shined,
just for me and you
I was screaming long live all the magic we made
And bring on all the pretenders, I'm not afraid
Long live all the mountains we moved
I had the time of my life fighting dragons with you

Long live x new years day x the manuscript - Taylor Swift

