Towards the effective introduction of physical activity interventions in primary health care

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Chapter 3

Factors influencing the introduction of physical activity interventions in primary health care: a qualitative study

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Abstract

Background

The introduction of efficacious physical activity (PA) interventions in routine primary health care (PHC) is a complex process. Understanding factors influencing the process can enhance the development of successful introduction strategies.

Purpose

The aim of this qualitative study was to explore stakeholders' perceptions on factors influencing the introduction, i.e., adoption, implementation, and continuation, of PA interventions in PHC.

Method

Twenty-eight semi-structured interviews were held with intervention managers, PHC advisors, intervention providers, and referring general practitioners of five PA interventions delivered in PHC. A theoretical framework on the introduction of innovations in health care was used to guide the data collection. Influencing factors were identified using thematic analysis.

Results

Stakeholders reported preconditions for the introduction of PA interventions in PHC (e.g., support, resources, networks and collaborations), in addition to characteristics of PA interventions (e.g., compatibility, flexibility, intervention materials) and characteristics of PHC professionals (e.g., knowledge, positive attitudes, beliefs about capabilities) perceived to enhance the introduction process. Furthermore, they proposed strategies for the development of PA interventions (e.g., involvement of future stakeholders, full development, refinement) and strategies to introduce PA interventions in PHC (e.g., training, assistance, reinforcement). The majority of the influencing factors was discussed specifically in relation to one or two stages.

Conclusion

This study presents an overview of factors that are perceived to influence the introduction of PA interventions in PHC. It underscores the importance of taking these factors into account when designing introduction strategies, and of giving special attention to the distinct stages of the process.

Introduction

In the last decades many interventions have been developed aimed at promoting physical activity (PA) in primary health care (PHC) [60]. These PHC-based PA interventions, such as PA counseling, prescribing PA, and patient referral to PA programs, have been shown to be effective in research settings [61–63]. However, rates of PA promotion by PHC professionals are far from optimal [50–52] and PA interventions are not delivered as intended by the intervention developers [1,9,53,54].

This gap between research and practice reduces the impact that evidence-based PHC-based PA interventions can have on public health [1,10–15]. It is likely to be due to the complexity of the introduction of innovations in health care settings [17,18,27,30]. Multiple parties are involved (e.g., health care organizations and professionals, insurance companies, governmental agencies) and the process consists of various stages: the adoption stage, in which the decision is made to start working with an intervention, the implementation stage, in which the intervention should be delivered as intended, and the continuation stage, which concerns long term delivery of the intervention [5,15,17–20]. Furthermore, the process may be influenced by a multitude of factors related to the innovation, PHC professional, patient, social setting, organizational context, and innovation methods and strategies [5,7,8,17,20,24,27,30,31,64].

Knowledge on which factors influence the introduction of PA interventions in PHC provides important information to apprise policy makers, intervention managers, and PHC advisors in the development of successful introduction strategies [7,12,17]. However, as yet, PA interventions' introduction to practice and the factors that influence this process are not often studied or reported on in the PA literature [12,58,59]. Huijg et al. [130] systematically reviewed the literature on factors influencing PHC professionals' PA promotion practices taking the comprehensive perspective of factors related to the innovation, PHC professional, patient, social setting, organizational context, and innovation methods and strategies [5,7,8,17,20,24,27,30,31,64]. In addition to the identification of a multitude of potential influencing factors, they concluded that different types of studies led to the identification of different categories of factors and that there is a lack of research on some categories of factors. In concordance with Chaudoir et al. [64], they suggest that research should take into account all categories of influencing factors and that qualitative research should inform quantitative research on the relationship between factors and PA promotion.

With regard to the different stages of the introduction process (i.e., adoption, implementation, and continuation), various scholars suggest that different factors may be of critical importance within these stages and, therefore, that specific innovation strategies may be required for each stage [5,15,17,18,20,22]. This emphasizes the importance of taking the different stages of the introduction process into account when exploring factors influencing the introduction of PA interventions in PHC. However, research that evaluates the influence of factors across the different stages of the introduction process is scarce [18]. Moreover, a very limited number of studies has investigated the adoption, implementation, and continuation of PHC-based PA interventions and the factors that influence the distinct stages [130].

To investigate factors influencing the introduction of PA interventions in PHC, we used a theoretical framework describing the different stages of the process (i.e., adoption, implementation, and continuation) and the different categories of determinants (i.e., innovation, socio-political context, organization, adopting person, and innovation strategy; Figure 1) [17,20]. The framework was developed for the identification of determinants of the introduction of innovations in health care and was successfully used for this purpose in various studies using both qualitative and quantitative methods [40–42,127]. Specifically, the framework was applied to prompt categories of determinants during focus group interviews [41,127] and to guide the development of questionnaire items which assess determinants of the introduction process [40,127]. In addition, the framework was applied to code answers to open-ended questions [40,127] and to structure the data into the different categories of determinants [40–42,127]. To the best of our knowledge, this study is the first to use this framework as a guide to study determinants of the introduction of PA interventions in PHC while taking into account the distinct stages of the process.

The aim of this study was to explore various stakeholders' perceptions on factors influencing the adoption, implementation, and continuation of PA interventions in PHC. Research questions that were addressed were: 1. which factors are perceived by stakeholders to be influencing the introduction of PA interventions in PHC, and 2. are factors perceived as specifically important to the distinct stages (i.e., adoption, implementation, and continuation) of the process?

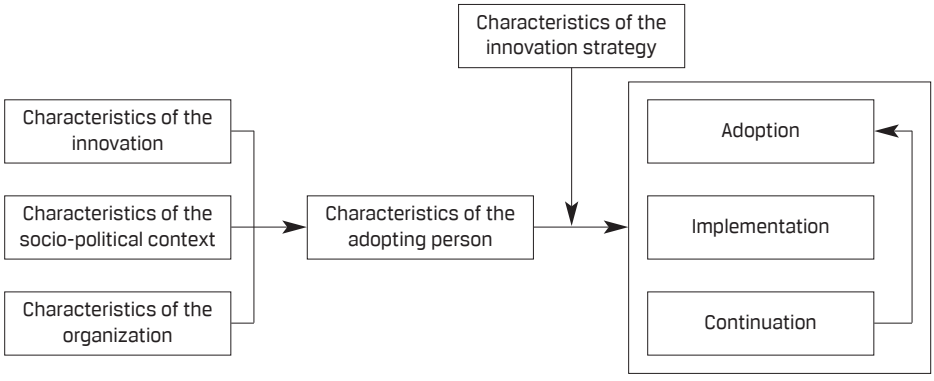

Figure. 1. **Framework representing the introduction process and related categories of determinants [20]**

Method

Design

This study was a qualitative study using semi-structured interviews with intervention managers, PHC advisors, intervention providers, and referring general practitioners (GPs) of five PA interventions delivered in PHC in the Netherlands.

Setting and participants

Three PA interventions and two interventions focusing on PA and dietary behavior delivered in PHC were purposively selected based on their differences in content and organization (see Table 1). This allowed for the identification of a variety of factors influencing PA interventions' introduction.

Table 1. Characteristics of interventions

Intervention & content	Procedure	Professionals involved
A. PA	GP referral (optional) A minimum of 2 (1 with lifestyle coach and 1 with PA coach) individual sessions	GP (optional) Lifestyle coach PA coach
B. PA	GP referral A minimum of 2 individual sessions with lifestyle coach 18 sessions (18 weeks) of PA in group under supervision of PA coach	GP Lifestyle coach PA coach
C. PA	GP referral A maximum of 3 months physical therapy (individual and group) A maximum of 3 months lifestyle courses A minimum of 6 months PA in community	GP Lifestyle coach Physical therapist
D. PA and dietary behavior	GP referral 10-15 group sessions over 3 months 1 year follow-up	GP Lifestyle coach Physical therapist Dietician Psychologist
E. PA and dietary behavior	GP referral A maximum of 1 year individual and group sessions PA based in PHC and the community	GP Lifestyle coach Physical therapist Dietician Psychologist

Note. PA, physical activity; GP, general practitioner; PHC, primary health care

From each intervention five or six stakeholders were interviewed. In total, six intervention managers (i.e., those who manage the organization of an intervention), four PHC advisors (i.e., those who advise and assist PHC organizations and professionals), eleven intervention providers (i.e., those who deliver an intervention), and seven referring GPs (i.e., those who refer patients to an intervention) were interviewed (see Table 2). This heterogeneous group of stakeholders was selected to gain information on influencing factors from different perspectives and to identify a great variety of potential factors.

In terms of recruitment, intervention managers were addressed first and with their support, PHC advisors, intervention providers, and referring GPs were contacted. Researcher JH contacted the stakeholders by e-mail and telephone, informed them about the aims of the study, and invited them to take part in an interview. All stakeholders invited to participate in the study agreed to take part.

Table 2. Characteristics of the study population

Intervention	Intervention managers	PHC advisors	Intervention providers	GPs	Total
A.	2	0	2	1	5
B.	1	1	2	2	6
C.	1	2	2	1	6
D.	1	0	2	2	5
E.	1	1	3	1	6
Total	6	4	11	7	28

Note. PHC, primary health care; GP, general practitioner

Data collection

Twenty-eight semi-structured face-to-face interviews, ranging from 50 to 90 minutes, were conducted by JH between April and November 2010. At the time of the interview all participants were provided with information about the aims, procedures and ethical aspects of the study, gave informed consent, and received a monetary incentive of 40 euro for their participation. As the last two interviews added no new information, it was concluded that data saturation had been reached. Therefore, no more stakeholders were invited at that point. All interviews were audio-recorded and transcribed verbatim.

The interview topic list (Table 3) was based on a theoretical framework describing the different stages (i.e., adoption, implementation, and continuation) and categories of determinants of the introduction of innovations in health care organizations (i.e., innovation, socio-political context, organization, adopting person, and innovation strategy; Figure 1) [17,20]. Stakeholders were asked about their experiences with the adoption, implementation, and continuation of the intervention they were involved in, and about barriers and facilitators to the introduction process. Every part of the interview initially started with open-ended questions to allow interviewees to talk about their experiences and to report on factors that they perceived as most important. Subsequently, interviewees were prompted with the categories of factors that may play a role in the introduction process, to encourage them to think about other influencing factors.

The topic list was developed collaboratively by the research team, and was pilot tested with a policy maker who had been involved in the introduction of a PA intervention in PHC. Piloting indicated that the interview structure and questions were clear and that they were suitable for the purpose of the study. Therefore, it could be concluded that the topic list was ready to use and no changes were necessary. In addition, no adaptations to the topic list were made during the interviewing phase.

Table 3. Interview topic list

General
• Could you tell me something about your experiences with the intervention?
• How did you get involved in the intervention?
Adoption
• Could you tell me about your* decision to work with the intervention?
• Which factors have influenced your* decision to work with the intervention? Prompts: did other factors related to the innovation, socio-political context, organization, patient, adopting person, and innovation strategy influence your* decision to work with the intervention?
Implementation
• Could you tell me about the way you* deliver the intervention?
• Which factors influence the way you* deliver the intervention? Prompts: did other factors related to the innovation, socio-political context, organization, patient, adopting person, and innovation strategy influence the way you* deliver the intervention?
Continuation
• Could you tell me about your* future plans with regard to the intervention?
• Which factors influence your* (dis)continuation of the intervention? Prompts: did other factors related to the innovation, socio-political context, organization, patient, adopting person, and innovation strategy influence your* (dis)continuation of the intervention?
Note. *, Intervention providers were asked about their adoption, implementation, and continuation of the intervention. Intervention managers and PHC advisors were asked about the adoption, implementation, and continuation by PHC organizations and intervention providers.

Ethics

The Medical Ethics Committee of the Leiden University Medical Centre granted ethical approval of this study (reference number NV/CME 09/081).

Data analysis

A thematic analysis was conducted on the transcribed interviews, using ATLAS.ti [128]. Thematic analysis was considered to be an appropriate technique as it can be used for "identifying, analyzing, and reporting patterns (themes) within the data" [68] (p.79). Furthermore, it can be used to organize and describe a data set in rich detail, by taking an inductive or theoretical approach [68]. In this study, we used an inductive approach of thematic analysis [68] to create codes, factors, and themes that were strongly linked to the data. A code was created for everything that was reported by the stakeholders to have a positive or negative influence on the introduction process. Codes on the same topic were brought together as a factor and factors were then grouped in themes.

Initially, two researchers (JH and NvdZ) with different perspectives on the introduction of PA interventions in PHC (theoretical versus practical) independently coded the data of six interviews. After coding the first three interviews, JH and NvdZ reflected on their results to determine if they formulated similar codes for stakeholders' quotations. Differences in codes were discussed. After coding the next three interviews, there was substantial overlap among the researchers' codes. Therefore, JH coded the other interviews individually. Next, JH and NvdZ independently developed factors and themes, organizing the multitude of codes. In cases of disagreement, consensus was achieved via discussion with a third researcher (WG). Finally, JH and a research assistant independently classified the factors according to the stage stakeholders mentioned the factors had an influence on. During the analyses, the researchers completed memos enabling them to keep track of their analytical thoughts and theoretical ideas. These memos were used as input during the discussions. Quotes to illustrate the results were translated from Dutch to English and as such are not presented here in the stakeholders' own language.

Results

Influencing factors

Factors perceived by stakeholders as influencing the introduction of PA interventions in PHC are shown in Table 4.

Preconditions for the introduction process

Many stakeholders talked about preconditions for the introduction of PA interventions in PHC. They reported that, before the actual development of an intervention, it is essential that the medical culture is prevention-oriented. In other words, authorities, PHC organizations, professionals, and patients need to believe that prevention is important. Stakeholders perceived that this may be facilitated by the existence of a public health problem that is related to a lack of PA, such as the increased incidence of cardiovascular disease and diabetes type 2. Furthermore, they found that a prevention-oriented medical culture may be enhanced by prevention and lifestyle behaviors being a part of PHC professionals' formal education. In addition to the popularity of prevention, the majority of stakeholders highlighted the relevance of support for the intervention. First, interventions need socio-political support, for example from the government, local authorities, and insurance companies. Specifically, it was reported to be helpful if PA interventions are part of national and/or local policies and that they are provided with financial support.

> *"Insurance companies, the municipal health service, and local authorities were involved, so we had a good basis."* (Intervention provider 7, male)

Second, PHC organizations and professionals should support PA interventions, as they are the ones that need to deliver the intervention to their patients. Higher levels of socio-political support appeared to be related to greater access to resources for the introduction of PA interventions in PHC. Perceived necessary resources included financial resources to introduce interventions, time to deliver PA interventions, and PA facilities within the community.

> *"Financial reasons. If the government will not provide resources to maintain the intervention and we do not receive any money from insurance companies, it will stop."*
> (PHC advisor 2, female)

In addition, networks and collaborations between key stakeholders were reported to facilitate the introduction process. Specifically, networks and collaborations between intervention managers, government, local authorities, and insurance companies were found to play an important role in collecting sufficient financial resources for the intervention's introduction and its future sustainability. Networks and collaborations between intervention managers, PHC advisors, and PHC organizations and professionals were stated to be relevant to the adoption, implementation, and continuation of PA interventions, and networks and collaborations between PHC professionals and PA facilities within the community were perceived to enhance intervention participants' maintenance of PA and, therefore, the interventions' effectiveness.

> *"It is important to contact GPs and convince them to refer patients and arrange sport locations. You need to talk to people to make it work."* (Intervention provider 2, female)

Intervention characteristics

Intervention's compatibility with the PHC setting was an important suggested intervention characteristic. Specifically, interventions should fit with professionals' knowledge, skills, and routines. In this way, interventions are easily integrated in daily practice and the delivery of PA interventions does not cost much extra time. For the same reason, stakeholders also stated that PA interventions should not be too complex to be delivered:

> *"I think it is very important that my colleagues realize referring patients is very simple and that it does not cost extra time."* (GP 6, male)

Often, different PHC professionals work together in delivering PA interventions. For instance, GPs refer, lifestyle coaches counsel, and physical therapists train intervention participants. To make sure that tasks and roles are clear, it was said to be desirable to develop an intervention with a standard protocol. On the other hand, stakeholders reported that interventions must be sufficiently flexible so that they can be tailored to intervention participants' needs (e.g., age, PA preferences, culture) and professionals' own time schedules. In addition, the introduction of PA interventions was found to be facilitated by providing professionals with intervention materials that they can use for intervention delivery (e.g., screening instruments, digital registration system, list with PA options) as well as material that can be provided to intervention participants (e.g., information packages, intervention booklet).

> *"We provide patients with a beautiful PA intervention booklet. It includes assignments, and a PA and nutrition diary. Working with this booklet works really well."* (Intervention provider 8, female)

Stakeholders discussed that changes in health care practice may occur when the innovation has relative advantages compared to old routines, for instance, when PA interventions reduce health care costs and GPs' workload (e.g., by improving patients' health) or when they enhance collaborations by facilitating networks.

> *"Physical activity level increased, health care consumption decreased, and psychosocial wellbeing improved. Furthermore, the GPs' work pressure decreased, because regular patients stayed away. (...) So at some point we knew we had something that worked."* (PHC advisor 4, male)

Furthermore, it was stated that PA intervention delivery needs to be financially feasible, i.e., professionals' work needs to be sufficiently reimbursed and financial benefits should outweigh organizational costs.

Strategies for intervention development

In addition to intervention characteristics, stakeholders mentioned strategies to develop interventions. At the time of the interview, many different PA interventions were being introduced in PHC in the Netherlands. To reduce overlap and 'reinvention of the wheel', stakeholders recommended that PA interventions should work together and/or that new interventions could be based on earlier examples. When aiming for the development of an intervention with the right characteristics, involving future stakeholders was a suggested strategy. For example, PHC professionals (i.e., future intervention providers and referring GPs) could be involved in discussions on intervention development and the process of introducing them in practice.

> *"We interviewed everybody that was involved in prevention, PHC, and wellbeing. (...) This provided us with a lot of information on how to develop the intervention."* (Intervention manager 6, female)

Furthermore, stakeholders described that some interventions are introduced when they are already fully developed (e.g., finances, collaborations between PHC professionals, and networks with community PA facilities are arranged), while others are introduced with many uncertainties and arrangements to be done by PHC organizations and professionals. A PHC advisor describes that the latter could be a barrier to the introduction process:

> *"It is not fully developed yet, still a lot of things need to be arranged. This is a very big task, which PHC professionals are often not equipped to do. They don't have the time, they need to run their practice, and often they don't have the capabilities to do it. Therefore, I believe this is way too much to ask."* (PHC advisor 3, male)

Finally, stakeholders stated that it is important that the intervention is refined when needed (e.g., based on formal evaluations, intervention providers' feedback).

PHC professionals' characteristics

PHC professionals play an important role in the introduction process, as they are the ones that need to deliver the intervention to their patients. Their characteristics were perceived as relevant influences. First, PHC professionals need to believe that prevention and delivering PA interventions are part of their role and responsibility. If they consider an active lifestyle to be their patients' own responsibility, this will decrease the chance that they will decide to work with a PA intervention.

> *"I don't feel responsible for patients' behavioral change, but I do feel responsible for motivating a person that is overweight and referring him or her to a PA intervention."* (GP 4, male)

Furthermore, they need to have positive attitudes towards PA intervention delivery and they need to be motivated. On the one hand, it was stated to be helpful when professionals believe that PA is important, when they are physically active themselves, and when they believe that the intervention is well-developed, evidence-based, relevant, and effective. On the other hand, PHC professionals' beliefs that intervention participants' are not motivated and that they lack the ability to maintain changes in PA behavior were perceived inhibitors. PHC professionals' motivation was said to be frequently related to having a passion for PA, for helping people, or for the target group, and to be related to enjoying working with the intervention and with the team of involved professionals. In addition to motivational factors, PHC professionals' knowledge and skills to deliver the intervention, and their experience with the intervention and the target group were also found to play an important role. Moreover, stakeholders reported that PHC professionals need to believe that they are capable to deliver the intervention.

"You need to constantly motivate and encourage these people. It appeared something I was not very good at." (Intervention provider 7, male)

Finally, stakeholders proposed that the introduction process is enhanced if delivering the intervention is considered a priority and the behavior is performed automatically.

"I know the project exists and it is prominent in my head. Therefore, in every consultation I think: would this be one to refer?" (GP 5, female)

Introduction strategies

Many stakeholders discussed strategies to introduce PA interventions in PHC. They reported that awareness of the intervention could be facilitated by media attention, such as announcements on the intervention in regional newspapers or medical journals.

"They have read or heard about the intervention, colleagues informed them, or they saw it on the internet. It has been discussed in the newspaper as well, which led to a lot of newly interested professionals." (Intervention manager 2, male)

Furthermore, stakeholders suggested that intervention champions can be deployed to encourage PHC organizations and professionals to adopt PA interventions, deliver them as intended, and continue doing this for a longer period of time. Providing PHC professionals with a training was found to be necessary to prepare them for intervention delivery, while assistance was suggested to be helpful during intervention delivery. Examples of assistance that were given were the option to call or send an email to the intervention manager or PHC advisor in case of uncertainties and the organization of meetings in which professionals' can share their experiences (i.e., peer supervision).

"I think assistance is really important, because delivering the intervention is not that easy." (Intervention provider 3, male)

Reminders were put forward as a strategy to prompt GPs with the intervention as an option to refer their patients to. Moreover, stakeholders stated that it is important to reinforce PA intervention delivery, which could be actively done by giving PHC organizations and professionals money (i.e., reimbursement) and recognition.

"Getting recognition for what I am doing works very rewarding." (Intervention provider 6, female)

Furthermore, the introduction's success was perceived to be an important facilitator. PHC professionals' experience with a large amount of colleagues delivering the intervention, the intervention's high reach of the target group, intervention participants' positive feedback, and the intervention's effectiveness were perceived to enhance the introduction process. Therefore, it was found to be important to evaluate the introduction's success and make results observable.

Stages

The majority of the influencing factors was discussed specifically in relation to one or two stages (Table 4). Preconditions for the introduction process were mostly discussed with regard to the adoption and the implementation stage, while support, financial resources, and networks and collaborations remained important during the continuation stage. Intervention characteristics were foremost perceived to influence the implementation stage, yet some intervention characteristics were found to be important for the whole process (i.e., compatibility, relative advantages, financial feasibility) or for both the implementation and the continuation stage (i.e., little time investment, complexity). Strategies for intervention development were perceived most important for either the adoption and implementation stage (i.e., involvement of future stakeholders, full development) or

PA interventions' implementation and continuation (i.e., collaborations between interventions, the use of other interventions as examples, refinement). PHC professionals' characteristics were foremost perceived to influence the implementation stage, while professionals' attitudes and motivation were also perceived to influence the adoption and continuation stage and their perceived role and responsibility was found to be specifically important for the PA intervention adoption. Introduction strategies were mainly discussed with regard to the implementation and continuation stage, yet intervention champions were also found to be important for the adoption stage and media attention was specifically reported with regard to the adoption of PA interventions.

Table 4. Factors influencing the introduction of PA interventions in PHC and the different stages

Themes & factors	Stages		
	A	I	C
Preconditions for the introduction process			
Prevention-oriented medical culture	x	x	
Public health problem related to PA	x		
Formal education on prevention and lifestyle behaviors	x	x	
Support for the intervention (policy, financial, PHC)	x	x	x
Financial resources to introduce interventions	x	x	x
Time to deliver interventions	x	x	
PA facilities within the community		x	
Networks and collaboration	x	x	x
Intervention characteristics			
Compatibility	x	x	x
Little time investment		x	x
Complexity		x	x
Standard protocol		x	
Flexibility		x	
Intervention materials		x	
Relative advantages	x	x	x
Financial feasibility	x	x	x
Strategies for intervention development			
Work together with other interventions		x	x
Use example interventions		x	x
Involvement of future stakeholders	x	x	
Full development	x	x	
Refinement		x	x

Table 4. **Factors influencing the introduction of PA interventions in PHC and the different stages (continued)**

Themes & factors	Stages		
	A	I	C
PHC professionals' characteristics			
Perceived role and responsibility	x		
Attitudes	x	x	x
Motivation	x	x	x
Knowledge		x	
Skills		x	
Experience		x	
Beliefs about capabilities		x	
Priority		x	
Automaticity		x	
Introduction strategies			
Media attention	x		
Intervention champions	x	x	x
Training		x	
Assistance		x	x
Reminders		x	
Reinforcement		x	x
Introduction's success		x	x
Evaluation		x	x
Observable results		x	x

Note. A, adoption; I, implementation; C, continuation; PA, physical activity, PHC, primary health care

Discussion

The aim of this qualitative study was to explore stakeholders' perceptions on factors influencing the introduction of PA interventions in PHC and to examine to what extent factors are perceived as specifically important to one of the distinct stages of the process (i.e., adoption, implementation, and continuation stage).

In line with the literature on the introduction of innovations in health care [5,7,8,17,20,24,27,30,64], many factors were reported as potential influences on the introduction of PA interventions in PHC. Important themes of factors were preconditions for the introduction process, characteristics of interventions and PHC professionals that enhance the adoption, implementation, and continuation of PA interventions, in addition to strategies to develop PA interventions and to introduce them in PHC.

The majority of the factors were previously reported as influencing factors in qualitative studies on PA promotion in PHC. Other factors are an addition to the existing literature. With regard to preconditions for the introduction process, time to deliver the intervention was the most often

cited factor [69,70,75,78,79,85,90,91,100,107,110,114,120,125], while existence of a public health problem related to PA was the only precondition that was not previously reported. In addition, Sassen et al. [113] found that PHC professionals' support is a significant predictor of PA promotion. Most often cited intervention characteristics were intervention materials [70,75,78,79,85,107,114] and intervention's flexibility [78,110,114,125]. Intervention's complexity, relative advantages, and standard protocol were not reported earlier in the PA intervention literature. Stakeholders' perceived strategies for intervention development were not previously reported, except for the strategy to fully develop a PA intervention before introducing it in PHC [78,90,110,114,120,125]. Stakeholders' perception that interventions should work together and use other interventions as examples might be related to the period in which the interviews were held, as at that time a great variety of PA interventions were being introduced in Dutch PHC. Most often cited PHC professionals' characteristics that may enhance the adoption, implementation, and continuation of PA interventions were professionals' attitudes, including their attitudes towards PA and the intervention [69,70,78,90,110,111,114,117,125] and towards intervention participants [78,79,85,90,91,107,110,120,125]. Furthermore, Walsh et al. [121] found that attitudes and PA promotion were positively associated and Sassen et al. [113] found that attitudes significantly predict PA promotion. Reinforcement [78,79,107,114] and reminders [78,114,125] were most cited introduction strategies, while intervention champions, assistance, and evaluation were not previously reported with regard to the introduction of PA interventions.

Factors found are consistent with leading theoretical models on the introduction of innovations in health care (e.g., [8,24,27,30,31]). This suggests that they might affect the introduction of evidence-based interventions in health care in general, not merely PA interventions. For instance, preconditions related to the socio-political culture, support, resources, and networks are central determinants in Greenhalgh et al.'s [27] and Damschroder et al.'s [8] models, in addition to some of the reported strategies (e.g., involvement of future stakeholders, intervention champions, assistance, reinforcement, evaluation). Furthermore, the intervention's compatibility, complexity, and relative advantages, in addition to the observability of the results correspond with four out of five (i.e., compatibility, relative advantage, complexity, observability, and trialability) of Rogers' [24] described characteristics of innovations influencing the introduction process. Factors related to characteristics of the PHC professional are prominent in Damschroder et al.'s model [8] and central in the Theoretical Domains Framework on determinants of implementation behaviors [30,31].

The majority of influencing factors was discussed specifically in relation to one or two stages of the introduction process. Many stakeholders reported important preconditions for the introduction process. This implies that the medical culture, support, resources, and networks and collaborations should be taken into account before the actual development of an intervention. Furthermore, preconditions were perceived to influence the distinct stages of the introduction process; they were mostly reported with regard to the adoption and the implementation stage. This is in line with Fixsen et al. [18] who previously described the importance of political and financial support for the adoption stage. Intervention characteristics and PHC professionals' characteristics were foremost perceived to influence the implementation stage. The importance of PHC professionals' characteristics for the implementation of PA interventions corresponds with Bartholomew et al. [15] who stated that behavioral capability, skills, and self-efficacy become more important when evolving from the adoption to the implementation of health promotion interventions. Finally,

strategies for intervention development were either reported to influence the early or the later stages of the introduction process, and introduction strategies were mainly discussed with regard to the implementation and continuation stage. This suggests that indeed different factors play a role in the adoption, implementation, and continuation of PA interventions in PHC. However, these findings should be further investigated using longitudinal designs. If replicated in future research, they will suggest that special attention should be given to the distinct stages of the process when doing research and designing introduction strategies [5,15,17,18,20,22].

Some limitations need to be taken into consideration when interpreting the results. The sampling strategy may have introduced a positive bias with regard to the factors mentioned, since the majority of participants was actively involved in the introduction process at the moment of the interview. This has potentially increased the identification of factors considered important from a more positive view. It is possible that if more people had been interviewed who had decided not to adopt the intervention, or who had discontinued working with the intervention after some time, more knowledge would have been gathered on barriers to the introduction process. The explorative approach of this study served the study's primary aim to identify as many factors as possible. However, the open character of the interviews decreased the focus on the distinct stages of the process. Therefore, it made it difficult to differentiate between the distinct stages from the interview transcripts. Possibly as a result, many factors were related to multiple stages of the introduction process. Consequently, we mostly described the importance of themes of factors for the distinct stages, while we were cautious with linking individual factors to a specific stage. Next, identification of themes or factors does not provide evidence for the relative importance of factors nor for the relationship between factors and the adoption, implementation, and continuation of PA interventions in practice. These are merely intervention managers', PHC advisors', intervention providers' and referring GPs' perceptions on what might influence the introduction process. Although interviews are required in exploratory research, other research designs are needed to establish which of these factors are most important to use as a foundation for the development of introduction strategies. Next steps to increase further knowledge on the introduction of PA interventions in PHC may include the development of a questionnaire to investigate influencing factors in a quantitative way. In addition, future studies should focus on examining causal relationships between factors and PHC organizations' and professionals' adoption, implementation, and continuation of PA interventions. For this purpose, we suggest conducting longitudinal studies in which the introduction of newly developed evidence-based PA interventions in PHC is closely monitored. Finally, the effectiveness of strategies targeting these introduction determinants should be investigated in randomized controlled trials.

Conclusion

To our best knowledge, this study is one of the first attempts to explore factors influencing the introduction of PA interventions in PHC, including the distinct stages of the process and taking into account various stakeholders' perceptions. The study provides an overview of preconditions for the introduction of PA interventions in PHC, characteristics of interventions and PHC professionals that enhance the process, and strategies to develop PA interventions and to introduce them in PHC. Policy makers, intervention managers, PHC advisors, and intervention developers could take these factors into account when planning the introduction of PA interventions in PHC and developing effective introduction strategies. Furthermore, the findings suggest that different factors may be important for the adoption, implementation, and continuation of PA interventions, which, if replicated in future research, implies that special attention should be given to the distinct stages of the process when designing strategies and doing research. Finally, the present findings can guide future research on factors' influence on the adoption, implementation, and continuation of PA interventions in PHC, including research on factors' relative importance and changeability, causal relationships between factors and the introduction process, and effective introduction strategies.