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The 'Stages towards Completion Model': what helps and hinders children with overweight or obesity and their parents to be guided towards, adhere to and complete a group lifestyle intervention

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ABSTRACT

Purpose: Lifestyle interventions can be effective in the management of overweight and obesity in children. However, ineffective guidance towards interventions and high attrition rates affect health impacts and cost effectiveness. The aim of this study was to gain insight into the factors influencing participation, in particular guidance towards, adherence to and completion of an intervention.

Methods: A narrative literature review was performed to identify factors related to participation, leading to the development of the "Stages towards Completion Model". Semi-structured interviews (n = 33) and three focus group discussions (n = 25) were performed with children and parents who completed two different group lifestyle interventions, as well as with their coaches.

Results: The main barrier to participating in a lifestyle intervention was the complex daily reality of the participants. The main facilitator to overcome these barriers was a personal approach by all professionals involved.

Conclusions: Participation in a lifestyle intervention is not influenced by one specific factor, but by the interplay of facilitators and barriers. A promising way to stimulate participation and thereby increase the effectiveness of interventions would be an understanding of and respect for the complex circumstances of participants and to personalize guidance towards and execution of interventions.

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KEYWORDS

Childhood obesity; lifestyle intervention; personalized approach; facilitators; barriers; qualitative research; participation

Introduction

Childhood obesity is a major public health problem. The World Health Organization has described childhood obesity as "one of the most serious public health challenges of the 21st century" (WHO, 2017). Obesity at a young age can have direct negative health effects and can also lead to long-term health problems, such as increased risk of cardiovascular disease, type II diabetes and higher morbidity (Kelsey, Zaepfel, Bjornstad, & Nadeau, 2014; Pulgaron, 2013). In addition to the effects on biomedical health, overweight and obesity may affect the quality of life of young people by causing psychological problems (e.g. low self-esteem), which may be related to social issues such as stigmatization, bullying and exclusion (Buttitta, Iliescu, Rouseah, & Guerien, 2014; Griffiths, Parsons, & Hill, 2010; Pont, Puhl, Cook, & Slusser, 2017; Reece, Bissell, & Copeland, 2015). Moreover, overweight and obesity and their consequences frequently affect vulnerable groups in

society, such as children growing up in poverty (Perez-Escamilla et al., 2018).

Combined lifestyle interventions can be an effective way to address overweight and obesity in children (Ells et al., 2018). This type of intervention should ideally target nutrition and physical activity, with a focus on behavioural change, thereby not only aiming for improvement of weight status, but creating long-lasting changes in lifestyle behaviour and quality of life, with the aim of preventing relapse as much as possible (NICE, 2014; Seidell, de Beer, & Kuijpers, 2008). Research has demonstrated that interventions can lead to improved weight status, fitness and self-esteem, and other (psychosocial) health-related benefits in young participants (Ells et al., 2018; Murray, Dordevic, & Bonham, 2017; Sacher et al., 2010). However, the potential impact of these interventions on children's health is challenged by difficulties in guiding them and their parents to suitable

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interventions and their adherence to these interventions (Denzer, Reithofer, Wabitsch, & Widhalm, 2004). High attrition rates of up to 73% have been reported (Moroshko, Brennan, & O'Brien, 2011).

As a consequence, interventions may fail to have the desired effects and cost effectiveness, as outcomes are strongly related to adherence and completion (Denzer et al., 2004). This can potentially reinforce socioeconomic differences, as overweight and obesity are not only more common in people with a lower socioeconomic position but they may also experience more barriers to adherence than others (Kelsey et al., 2014; Sallinen, Schaffer, & Woolford, 2013; Skelton, Martin, & Irby, 2016; Zeller et al., 2004).

Although ineffective guidance and high attrition rates are known problems for lifestyle interventions, research addressing the causes and possible solutions is scarce (Cui, Seburg, Sherwood, Faith, & Ward, 2015; McPherson et al., 2017; Miller & Brennan, 2015). In addition, existing studies have used various definitions of adherence, attrition and completion, and have studied these at different time points in the interventions, with a range of different outcome measurements. Therefore, it is difficult to compare and interpret the existing evidence, which limits our understanding of how best to address these issues (Dhaliwal et al., 2014; Miller & Brennan, 2015; Nobles, Griffiths, Pringle, & Gately, 2016). Moreover, most studies are based on routinely collected data rather than factors that have a theoretical or empirical association with participation (Moroshko et al., 2011). In addition, little is known about the motives and expectations of participants and the barriers to participation in an intervention (Miller & Brennan, 2015), while the majority of research has been performed with people who have dropped out rather than those who complete an intervention. Studying the latter could thus lead to new insights.

The aim of this study is to contribute to improving the effectiveness of group lifestyle interventions for children by gaining insights into facilitators and barriers to guidance towards, adherence to and completion of an intervention.

Methods

This study used a two-step approach: firstly, a narrative literature review was performed to identify factors that might play a role in guidance towards, adherence to and completion of a lifestyle intervention. A theoretical model was designed, in which these factors were structured according to the stages that we identified in the literature as leading towards completion. Secondly, an exploratory qualitative study of the perspectives, motives and experiences of completers (children and their parents) and the coaches of group lifestyle interventions for children

with overweight or obesity was undertaken to gain better insight into the role and significance of the factors identified in practice.

Narrative literature review & model

A literature search was undertaken in PubMed (July 2016), with the search strings of "lifestyle intervention"; "obesity intervention"; "overweight"; "recruitment"; "referral"; "retention"; "adherence"; "attrition"; "completion". The search was limited to studies in Dutch and English. The abstracts were assessed for relevance, with the full text of all relevant articles retrieved. Papers were included if factors related to guidance towards, adherence to and completion of lifestyle interventions for overweight or obesity were discussed, with a main focus on adaptable factors, rather than demographic predictors. We did not select papers specifically describing lifestyle interventions for children, as parents are also involved in family-centred interventions, so adult-related factors may thus also apply. Articles describing pharmacological and surgical treatments were excluded. Snowballing of the selected papers was performed to retrieve additional literature. The papers included ($n = 24$) were scanned for factors related to participation in interventions. All aspects were recorded and grouped to identify the predominant factors and stages in the process leading towards completion.

Explorative qualitative research

An explorative qualitative research approach was adopted, using the following methods:

Semi-structured interviews were held with 12 children and 14 parents who completed the interventions and with 7 coaches of the interventions. An interview guide was designed based on our model, which was derived from the literature. Children and parents were either interviewed together or separately, depending on their preferences. The interviews were held at the home of the respondents, at the location of the intervention or at a location in the neighbourhood, led by the preference of the participants in order to maximize feelings of comfort and safety. Interviews were performed in an iterative manner to gain a deeper understanding of recurring themes. A timeline was introduced at the start of the interviews with the children, which was used as a basis for a discussion of their experience with the intervention. The children indicated what they had thought and how they had behaved before, at the start, during, at the end and after the intervention with the use of emoticon stickers, drawings and text, and they were asked questions that prompted them to elaborate (see Figure 1 for an example of the methods used). At the end of each interview, the children were asked to write down

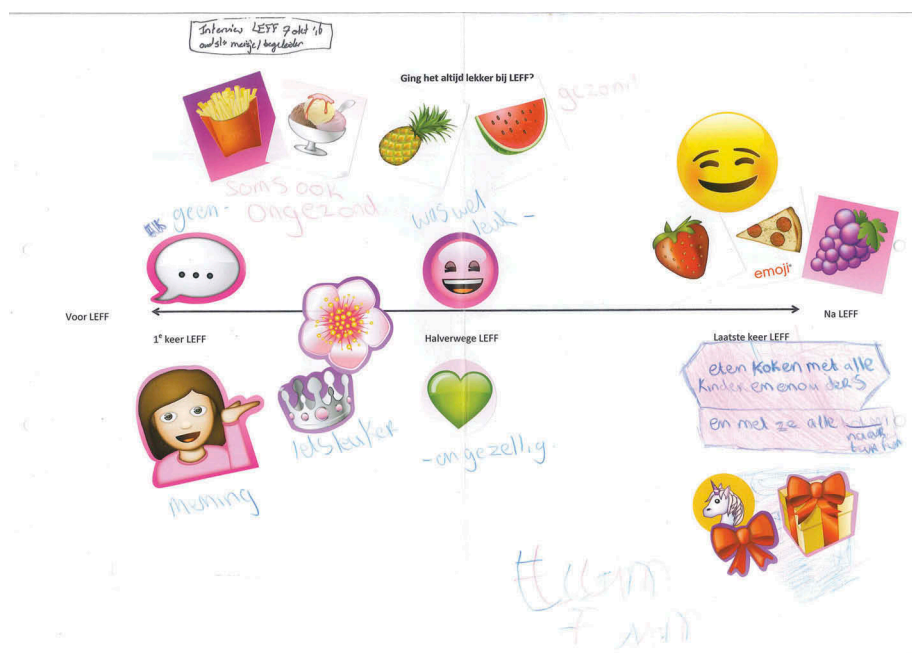


Figure 1. Example of used methods:Timeline.

a question for the other children in the study. This method was adopted to facilitate the discussion of topics among peers and to make the children feel more engaged in the project. The interviews with the parents and the coaches were held according to two different topic guides.

Focus group discussions were performed after the interviews to validate the topics identified and to deepen our understanding. In the focus group with parents ($n = 7$), the central question was: "How did you succeed in participating in this intervention?" In the two focus groups with children ($n = 10$ & $n = 8$), they were asked to make a poster using emoticon stickers and pencils that would motivate others to participate in a healthy lifestyle intervention (see Figure 2 for an example of the methods used). The posters were discussed in the group. Subsequently,

the children discussed their ideal intervention using a booklet with pictograms that indicated elements such as time, location and activities. All of the data were collected by the main researcher (PGW) between September and November 2016, with the exception of a few interviews that were performed by an assistant researcher due to scheduling difficulties.

Data analysis

All of the interviews were audio-recorded and transcribed with the exception of the focus groups, since it was impractical to use a recording device in the midst of the poster work. Focus group data was recorded by hand during the discussion and processed in detail immediately afterwards. An ethnographic content analysis was performed by PGW using QDA Miner Lite 2.0, and the coding was



Figure 2. Example of used methods:Poster.

discussed with another author (CD) and optimized in the course of the interview process.

Participants

Participants were recruited in August 2016 from two interventions in Amsterdam, the Netherlands. Both interventions were part of the Amsterdam Healthy Weight Programme, an integral programme to reduce the above-average prevalence of childhood overweight and obesity in Amsterdam (Amsterdam, 2017).

The LEFF (Lifestyle, Energy, Fun & Friends) programme is aimed at children aged 7 to 13 with overweight or (severe) obesity (Niemer, Bruggers, & van den Eynde, 2015). It runs for 10 weeks, with sessions twice a week. Each session begins with the children and parents discussing a central theme. Subsequently, the children spend the second hour performing a physical activity, while the parents further discuss specific topics. Two locations with high numbers of completers were selected. Families participating in the 2016 spring sessions, meeting the LEFF criterion for completion of > 75% participation (with the exception of one family with 70% participation) were contacted and invited by telephone, email or WhatsApp. Focus groups were held with participants in the penultimate session of the ongoing 2016 autumn season.

The Friends in Shape (FiS) programme is aimed at children aged 8 to 14 with (severe) obesity. The programme consists of two, one-hour sessions of physical exercise each week. FiS is an ongoing programme. Intake into the intervention occurs constantly throughout the year and participants may continue for up to a year. Participants may choose to be picked up before and brought back home after each session. The programme is primarily aimed at children, but parents may also join in and be actively involved in the recurrent parent sessions. Precise figures on the extent of completion for FiS are difficult to provide as it is an ongoing programme and current participants were interviewed. Some participants only participate in one of the two sessions a week, but may do so for a long time and can therefore be considered completers. Participants who were identified by their coaches as having regularly been involved in the programme for more than three months were recruited.

Ethics

This research does not fall under the Dutch Medical Research (Humans Subjects) Act, therefore, we followed the general ethical standards of the department. During recruitment via telephone, WhatsApp or email, the voluntary nature and anonymity of participation was explained. At the start of each interview and focus group session, the voluntary nature of participation, anonymity and the right to withdraw at any moment without consequences were emphasized

once more. These core principles were also presented in a concise informed consent form, which was signed by the researcher and the participants. All participants agreed to the recording of the conversations. The names in the results section are fictitious to ensure the anonymity of the participants.

Results

Below, we begin by describing the results of the narrative review and the model. Section B presents the perspectives of the children and parents who completed the intervention as well as that of their coaches.

A: Results of the literature review and development of a theoretical model

Based on the analyses of the articles and inspired by the Health Belief Model developed by Rosenstock (Rosenstock, 1966) and the Model of Adherence to Paediatric Medical Regimes developed by Rapoff (Rapoff, 1999), three subsequent stages in the process leading towards completion of a lifestyle intervention were distinguished: the *initiation stage*, the *intention to action stage* and the *adherence stage*, all of which may facilitate completion (see Figure 3 for an overview of the model). Below, the main factors in each stage are described. An overview of the barriers and facilitators found is presented for each factor. This may not be an exhaustive description, as the main aim of the model was to structure our knowledge of the barriers and facilitators and to identify ways of stimulating guidance towards, adherence to and completion of an intervention, rather than quantifying the effects and causal directions of all aspects of the main factors.

Stage 1: Initiation

Variables playing a role during initiation were grouped under two main factors: *motivation* and *referral process*.

Motivation of the child and parents can strongly influence the outcome of an attempt at guidance towards an intervention. Children and/or parents may be intrinsically concerned with the child's weight (Turner, Salisbury, & Shield, 2012). However, parents often underestimate the child's weight, or the problematic nature of it, which can be a barrier in guiding them to an intervention (Mikhailovich & Morrison, 2007). Other reasons for parents to be motivated to make lifestyle changes may be present, such as medical issues (e.g., bad teeth due to unhealthy diet (Rietmeijer-Mentink, Paulis, van Middelkoop, Bindels, & van der Wouden, 2013), or social issues, such as a low self-esteem (Stewart, Chapple, Hughes, Poustie,

& Reilly, 2008), bullying or social exclusion (Reece et al., 2015)).

Referral (as part of guidance towards an intervention) may occur in a medical environment (e.g., by a youth health care nurse, general practitioner, paediatrician) or in the social domain (e.g., a schoolteacher or social worker). Four relevant aspects of referral can be distinguished: (i) *approach of the referrer*: facilitation occurs when the approach is constructive, positive and solution-oriented, as opposed to being problem-oriented and judgemental (Mikhailovich & Morrison, 2007; Turner et al., 2012); (ii) *attitude of the referrer*: facilitation occurs if attitude is interested, sensitive, relational and patient-centred, but demotivating if distant and biomedically focused (Edmunds, 2005; Edvardsson, Edvardsson, & Hornsten, 2009); (iii) *language use of the referrer*: facilitation occurs if language is positive and motivating, as opposed to blaming or stigmatizing (Edvardsson et al., 2009; Puhl, Peterson, & Luedicke, 2011, 2013; Smith, Straker, McManus, & Fenner, 2014); (iv) *focus of the conversation with the referrer*: facilitation occurs if there is an awareness of the contextual complexity of overweight/obesity, but demotivating if an emphasis is placed on weight itself (Edmunds, 2008; Mikhailovich & Morrison, 2007; Turner et al., 2012).

Both motivation and referral may influence each other: if children and parents are intrinsically motivated, the referral may be facilitated by this motivation. If they appear unmotivated, this should challenge the referrer to look for the right way to motive and activate children and parents.

Stage 2: Intention to action

Variables playing a role during the intention to action stage were grouped under three main factors: *motivation, expectations and means*.

Motivation remains an important factor but may fluctuate over time, and is also influenced by expectations and means. In order to prevent no show at the start of the programme, it is important that both the child and the parent are motivated to participate (Grow et al., 2013).

Expectations concerning the content of the intervention will be facilitating if potential participants and referrers are convinced that the activities in the programme are attractive and constructive (Skelton & Beech, 2011), and if the intervention is believed to lead to the desired outcome (e.g., weight loss or more self-confidence) (Stewart et al., 2008). In addition, expectations of one's behaviour play a role, and will be facilitating if participants expect to do well in the intervention (Gunnarsdottir, Njardvik, Olafsdottir, Craighead, & Bjarnason, 2011) and feel confident

that they will be able to make the lifestyle changes (Gunnarsdottir et al., 2011).

The means of the potential participants may influence whether they are able to start an intervention. Barriers may include a lack of time, unavailability at specific meeting times, lack of transport or lack of other resources, such as not being able to find a sitter for other children in the family (Smith et al., 2014).

Stage 3: Adherence

The following factors were identified as playing a role in adherence during the intervention: *motivation, satisfaction, perceived benefits and means*.

Motivation to stay in the programme may continue to fluctuate based on other factors (see Stage 2). The parent's commitment to the child's health may be a strong motivator to overcome barriers during this stage (Grow et al., 2013; Stewart et al., 2008).

Satisfaction with the intervention is based on: the focus of and activities in the programme (Barlow & Ohlemeyer, 2006), the relationship with the coaches and other participants (Prioste, Fonseca, Sousa, Gaspar, & Francisco, 2015; Smith et al., 2014) and whether expectations are met (Sallinen et al., 2013). A lack of trust or connection with coaches and participants or disliking activities or the group dynamics may be barriers to adherence (Nobles et al., 2016).

Perceived benefits in the programme: early treatment response may facilitate adherence (Gunnarsdottir et al., 2011), while lack of weight loss may be a barrier to adherence (Ward-Begnoche & Thompson, 2008).

The means needed to stay in the programme include: time, logistics and income (Ligthart, Buitendijk, Koes, & van Middelkoop, 2016; Skelton et al., 2016; Smith et al., 2014), as well as support from the social environment that facilitates participation and lifestyle changes (Denzer et al., 2004; Owen, Sharp, Shield, & Turner, 2009; Schalkwijk et al., 2015; Stewart et al., 2008). If participants need more support than the programme and the environment offer, this may lead to attrition (Dhaliwal et al., 2014; Owen et al., 2009; Schalkwijk et al., 2015).

B. The perspectives of children, parents and coaches

Semi-structured interviews and focus group discussions were carried out with children and parents who completed the intervention, as well as the coaches involved in the intervention. An overview of the number and details of participants can be found in Tables I and II. A large number of barriers and facilitators to guidance, adherence and completion were mentioned during the interviews and focus groups. While all of the children and parents interviewed had completed the programme, all of them had

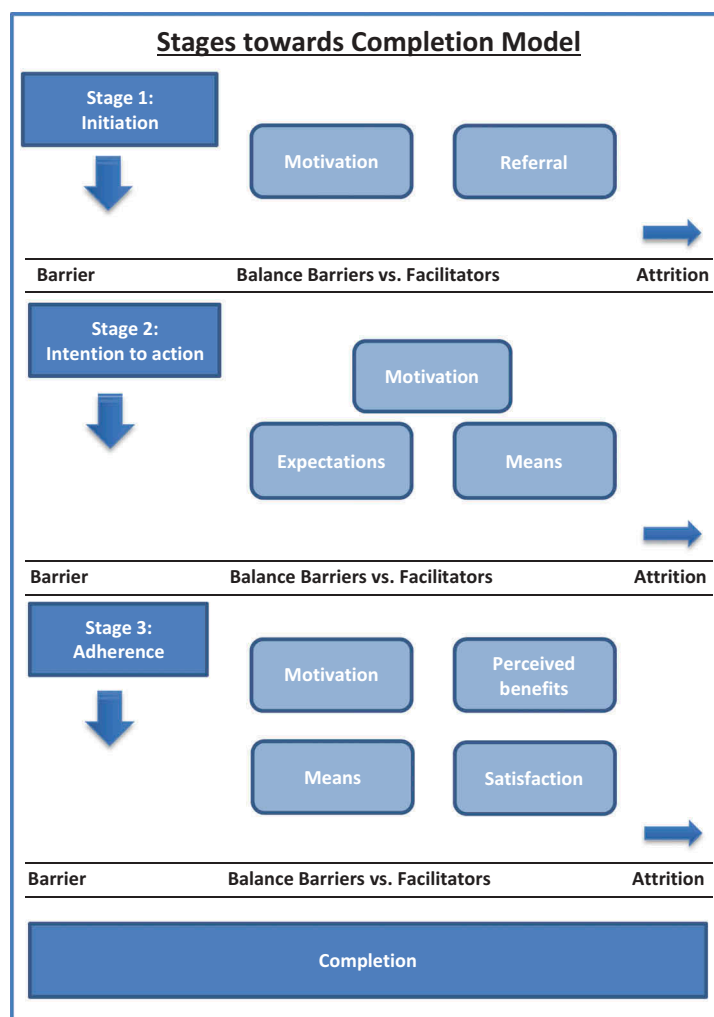


Figure 3. Stages towards Completion Model.

Table I. Overview of all participants for each intervention location in Amsterdam, the Netherlands.

Intervention	Location	Interviews children	Interviews parents	Interviews coaches	FGD children	FGD parents	Total
LEFF	Southeast	2	3	2	-	-	7
	New west	5	4	2	10	7	28
Friends in Shape	North	5	7	3	8	-	23
	Total n	12	14	7	18	7	58

experienced moments of doubt, resistant and challenges that needed to be overcome.

The barriers and facilitators mentioned confirm and sometimes supplement the factors found in the literature. The supplementing factors are found in stage 3 adherence and are mainly facilitators. Supplementing barriers to literature are only found in the factor “group dynamics”. Table III presents a combined overview of barriers and facilitators from the literature and from the interviews.

In order to gain an understanding of the role and significance of these aspects in practice, the main factors associated with guidance, adherence and completion that emerged from the analysis of the perspectives and experiences of participants will be described in more detail.

Expectations and referral

(i) Unclear expectations

Most families were referred through Youth Health Care (which is part of the municipal health service for all residents). Only a few children and parents clearly remembered the moment of referral. What they did remember was the feeling of not being thoroughly informed before starting the intervention. As one parent said: “no expectations, no, no, the doctor only told us to do one year of exercise at the [intervention].” Consequently, they had unclear expectations about the approach and content of the programme. They did, however, have clear expectations about outcomes; namely, for their child to lose weight and learn healthy behaviour. The failure to specifically address expectations in the referral process

Table II. Details on the interview participants for each intervention (N.B. details of the focus group participants were not recorded but participants were in the age group of the intervention: LEFF: mixed gender group in the age of 7–13; Friends in Shape mixed gender group in the ages of 8–14.).

LEFF			Friends in Shape	
Children	Girl	10	Boy	13
	Girl	9	Girl	13
	Girl	13	Girl	12
	Boy	7	Boy	14
	Girl	8	Girl	15
	Girl	11		
	Girl	9		
Parents	6 mothers	(age was not asked)	5 mothers	(age was not asked)
	1 father		2 fathers	
Coaches	3 female		2 female	
	1 male		1 man	

resulted in a variety of ideas about programme activities, ranging from disappointment to surprised satisfaction. As one disappointed parent said: *"I was triggered by what did not turn out to be the case. I thought you were going to exercise with your child [...] but it was not like that and I thought that was a pity."* Another, surprised parent reported: *"I thought it would be more exercise and less information, but afterwards I was very satisfied with the results."*

Motivation

(ii) Struggling with weight

When asked about their motivation to join in the intervention, parents replied they were looking for a way to deal with their child's weight. This reply was generally followed by elaborate stories of how they had been searching for a solution for a long time: *"We have been struggling with it since she was born."* Parents shared their concerns about their child's weight, discussing how they had tried many approaches, sometimes even expressing despair: *"Eventually I no longer had any idea about how to make her lose weight."*

Families had tried multiple approaches, including visits to their GP, a physiotherapist, dietician, exercise programmes, specialists and other obesity clinics. All of the families reported trying to eat healthily, and discussed home rules such as only drinking water, snacking on fruit and no crisps during weekdays.

(iii) Consequences of being overweight

Children did not mention very explicit motivations for participating in the intervention. Some "had to go" because their parents had decided. Others reluctantly talked about the desire to be fitter or live a healthier life: *"Because I did not want to become much fatter, as I was a little bit fat."* Only some specifically used terminology such as *"because I am overweight"*.

Despite the reluctance to talk about weight, children clearly struggled with the consequences of it in their lives. They talked about not wanting to be an "exception" or to be bullied. Coaches confirmed that children were often

bullied at school and struggled with low self-esteem, leading to insecurity in social situations. Most of the children were very self-aware about their weight. One striking example is how one girl and her friend talked with the researcher about their efforts to cover up their weight:

Amisha: *"I don't mind being fat [...] but when you are bullied, then you really do not feel good."*

Felicia: *"Look, I usually wear jogging pants or pants in which you can hardly see, well, that you are fat. Like her, she wears [...]."*

Amisha: *"I always wear dresses in which you see to here [points at herself]."*

Felicia: *"And I wear loose shirts in which you look skinnier."*

(iv) Wanting to do the best for the child

For parents, the most frequently mentioned reason to participate is for their child's wellbeing: *"I said okay, if it is good then I want to do it, because I always want to do what is good for her."* Parents want to make an effort for the sake of their child's health: for them to lose weight and become fitter. However, the child's mental health is also a motivator: parents mentioned how they would like their child to feel more self-confident and not to be bullied: *"He doesn't easily make contact with [other] children [...] sometimes the children [at school] said to him 'fat bag, why are you fat' [...]."*

Satisfaction and perceived benefits

(v) Group dynamics

Children's accounts of their experience of the intervention focused around the word "gezellig" (a relaxed atmosphere). They enjoyed "being part of a group" and having "fun". Many children started to really enjoy participation after a few meetings as they had "made friends". However, two children recalled a negative experience with others, which appeared to affect their entire opinion of the programme:

Cherelle: *"Halfway [through the programme] some children were annoying me [during physical activity]."*

[...]

Interviewer: *"You said at some point you did not like it in the programme anymore, why?"*

Cherelle: *"Well, after those children were annoying me [...]."*

Parents had enjoyed the conversations with the other parents, in which they learned from each other and found recognition of their situation and their struggles: *"And then you learn, then you know it from*

Table III. Overview of barriers and facilitators identified in the literature, interviews and focus groups topics identified from the participant's perspectives are indicated by [PP], topics from the literature are indicated by [LT]. Factors marked light grey are only mentioned in literature and factors marked dark grey are only mentioned by participants.

Factor			Barriers		LT	PP	Facilitators		LT	PP
Stage 1: Initiation										
Motivation	Perceived seriousness & susceptibility	Not perceiving overweight/obesity as a problem			✓		Perceiving overweight/obesity or the consequences thereof as a problem		✓	✓
Referral	Approach referrer	Judgemental			✓	✓	Weight-related incident in social circle or celebrity		✓	✓
	Attitude referrer	Biomedically oriented			✓		Constructive and solution-oriented		✓	
	Language	Stigmatizing, blaming			✓	✓	Interested, sensitive, relational		✓	
	Focus of the conversation	Main focus on weight			✓	✓	Motivating		✓	
							Complex context of weight		✓	✓
Stage 2: Intention to action										
Motivation		Little motivation in parent and/or child to participate in intervention			✓		Strong motivation in parent and/or child to deal with the problem (because of weight, bullying or other)		✓	✓
Expectations	Perceived benefits	No desired effects expected			✓		Positive and realistic expectations		✓	✓
		Content Perceived as unattractive/not useful			✓		Perceived as attractive/useful		✓	✓
Means	Accessibility	Far away (perception)			✓	✓	Close by (perception)		✓	✓
		No transportation means			✓	✓	Possessing transportation means		✓	✓
		Time Being unavailable during intervention moments			✓	✓	Being available during intervention moments		✓	✓
Stage 3: Adherence										
Motivation	Children	To go to intervention			✓	✓	Gaining self-confidence > experience of success		✓	✓
		To change lifestyle			✓		Feeling good		✓	✓
	Parent	To go to intervention			✓	✓	Enjoying meetings		✓	✓
		To change lifestyle			✓	✓	Enjoying physical exercise		✓	✓
Attitude parents		Doing the best for the child			✓	✓	Desiring effects: health related or socially related		✓	✓
		Child is motivated					Child is part of group			✓
	Finish what you started					Being example for child			✓	✓
	Stories from former participants are stimulating								✓	✓
Perceived benefits		Desired effect not achieved (not quick enough)			✓	✓	Desired or unexpected positive effect achieved through participation		✓	✓
Means	Time	Being busy			✓	✓	Meeting on Monday, after weekend dip			✓
		Both parents work, complicated to bring or join child			✓	✓				
		Irregular working hours			✓	✓				
		Meetings during dinner time			✓	✓				
		Needing a sitter for other child(ren)			✓					
	Accessibility	Far away (perception)			✓	✓	Close by (perception)		✓	✓
		No transport means			✓	✓	Transportation provided by intervention			✓
	Language	Language barriers			✓	✓				
	Costs						Free intervention instead of expensive exercise club			✓
	Health	Illness/physical complaints			✓	✓				
Personalisation						Of programme towards personal situation and means, e.g., logistics, family situation, daily issues		✓	✓	
Satisfaction	Group dynamics children	Age differences			✓	✓	Fun		✓	✓
		Tension/insecurity				✓	Making friends, feeling of belonging			✓
		Negative experience in group				✓	Learning from each other		✓	✓
							Safe environment			✓
	Group dynamics parents	Latecomers during meeting				✓	Talking and finding recognition		✓	✓
		Dropouts			✓	✓	Learning from each other			✓
	Expectations	Content and/or effects of intervention do not match with expectations			✓	✓	Content and/or effects of intervention match with expectations		✓	✓
		Unrealistic expectations at start of intervention			✓	✓	Realistic expectations created at start of intervention		✓	✓

others. That is good about the group, because everyone has their own experience, their own tips, their own opinion. So that is important about [the intervention], you learn from each other as a group."

However, some elements of group dynamics were experienced as negative; in particular, language barriers hindered conversations and led to the attrition of fellow participants: "That was just very unpleasant, because it is something you start together [...] and you really need each other as parents, to exchange experiences and do the exercises."

(vi) **Perceived benefits**

The children reported that they were happy they had "changed": gaining more self-confidence, being fitter and sometimes having achieved weight loss. The children said they would motivate others to attend because the intervention helped "to believe in yourself". They also anticipated possible social barriers: "you do not have to be afraid, because it is a lot of fun"; "there are other children who are just like you"; "you can make many friends".

The parents were happy that their child was doing physical activity and that they had seen an improvement in their child's fitness. In addition, they were happy to have learned more about a healthy lifestyle: *"I have learned a lot! I tell you, I already knew a lot, but I have learned more."* However, some were disappointed with the extent of the weight loss, or with weight regain after the intervention.

Means

(vii) **Complex living conditions**

One recurring theme was the complex circumstances in which the families live. A substantial number of the families interviewed were single parents with multiple children, busy daily schedules and limited means. A number of parents suffered from chronic illnesses (such as rheumatoid arthritis) and thus had limited energy to travel and attend intervention meetings. Their complex lives were also recognized by the coaches, who explained that many families had multiple children with weight problems and related consequences, in addition to all of the other circumstances mentioned. The coaches reported that most of the dropout from the intervention was due to illness of either the parent or the child.

Another complicating factor was the lack of financial resources, as some families lived on unemployment benefits or had demanding jobs with irregular or evening hours. Consequently, this results in limited means, such as transport difficulties and not being able to pay for a sports club. One mother told us that she had to walk 20 minutes to the meetings and bring her other children with her because of a lack of a sitter. She also pointed out that the intervention was around dinner time, and the children were already tired from their school day and extra tutoring after school. This meant she had to cook at a later time, demonstrating how she and her family had to go to great lengths to attend meetings: *"It is hard for me in the winter [...] At 6.30 p.m. he is done [with the meeting] and it is dark. We have no car, no bicycles. I just walk with the kids [to get to the meeting]. I am always afraid when walking with the children in the dark [...] and sometimes it is cold for the children, and there is a lot of rain."*

Successful completion: The importance of a personalized approach

An essential theme in the stories of the families and coaches is the importance of building personal relationships with the participants and personalizing the guidance towards interventions and the intervention practice to address each participant's needs and circumstances. One of the coaches explained that a personalized approach was essential to stimulate adherence: *"My [coaching] experience has taught me to look at the composition of the group and what the*

group needs." All coaches reported being very inclined to do what they could to prevent participants from dropping out. If families failed to show up to a meeting, the coaches would call them to ask why and discuss how they could help them to attend. Many families also reported that their coaches were personally involved and motivated to help them attend the meetings. As one child said: *"They do not let you down or warn you many times to join in, but instead they motivate you to participate."* This personalized approach may concern seemingly small problems or solutions, which can make the difference between attrition and adherence. This is demonstrated in one story by a coach about a pregnant mother who was too tired to attend. The coach asked her: *"What can we do so that you feel more comfortable when you come?"* The solution was found by putting a comfortable couch in the room: *"She came in and saw it and immediately had a smile on her face."*

Discussion

Lifestyle interventions can be effective in the management of overweight and obesity in children, but difficulties in guiding people to interventions and high attrition rates affect their health impacts and cost effectiveness. Little is known about how to stimulate guidance towards, adherence to and completion of interventions for children. The aim of the current study was to gain greater insight by designing the Stages towards Completion Model. This was combined with and validated based on the perspectives and experiences of children and their parents who had completed an intervention, as well as their coaches.

This study revealed that there is not one dominating factor in successful guidance, adherence and completion, but that success depends on the interplay between various factors and whether these factors predominantly facilitate the overcoming of barriers. This finding was applicable in both of the interventions studied (LEFF and FiS), although they had different set-ups and made different demands of the participants. Based on the reports of the children, parents and coaches, it is clear that all of the families experienced a certain degree of complexity in their daily circumstances, which affected their ability to be guided towards and complete an intervention. Although numerous barriers to adherence were found, ranging from logistical challenges and poverty to language barriers and chronic illnesses, all of the participants managed to complete the intervention, demonstrating that barriers can be overcome by facilitators, as also suggested by Alberga (Alberga et al., 2013).

This study found that the main explanation for why the families managed to adhere to the intervention was a facilitating personalized approach by coaches and their effort to develop a personal connection. This personalization primarily concerns a willingness to make seemingly small changes and adaptations, such as offering a listening ear and support in finding solutions to overcome practical barriers, rather than altering the design or content of the intervention itself. The latter would not be desirable, as most interventions have been carefully developed and studied in order to warrant effectivity (e.g., (Sacher et al., 2010)). This personal approach might be seen as an additional step that facilitates the connection of the intervention with the participants and their specific situation. This confirms previous findings that suggest that a better understanding of the stages leading towards successful completion might be found in the interface between the programme, the families and their current situation (Skelton & Beech, 2011). Indeed, guidelines in the Netherlands, where this study took place, recommend that referrers and coaches make an effort to personalize guidance towards an intervention and the intervention itself, taking into account the circumstances of participants (Seidell, Halberstadt, Noordam, & Niemer, 2012). This personalization can accommodate participants to a certain degree, even in the case of group interventions.

Practical implications

Our results confirm current guidelines and demonstrate the promising strategy of a personalized approach to guidance towards an intervention and intervention practice that stimulates participation and completion:

Guidance towards an intervention: There is no single intervention programme that addresses the needs of all different types of potential participants (Burton, Twiddy, Sahota, Brown, & Bryant, 2019; Grow et al., 2013). Therefore, it is important to personalize guidance towards an intervention based on family type and circumstances. This means the referrer should attempt to understand what moves and motivates the families by communicating in an empathic and motivating way. Families should be informed about the range of interventions, allowing them to choose one they would prefer and are able to participate in based on detailed information, and further catering the information to both children and parents.

Intervention practice: It is important for coaches to build personal relationships with participants and to help them identify barriers to participation, as well as support families with practical solutions to overcome these barriers, as has also been proposed by previous research (Alberga et al., 2013; Owen et al., 2009). The perspectives of the participants can guide *how* and *what* to personalize. Positive experiences and effects

(not necessarily weight loss, but also psychosocial effects) during participation can stimulate adherence and also motivate participants to overcome barriers (Stewart et al., 2008). It is therefore likely that addressing the reasons for participants joining a programme and specifically discussing what is important for them to stay in the programme will stimulate successful guidance, adherence and completion. Our study confirms previous findings that suggest that the main reason for parents participating in such interventions is the desire to do the best for their child (Grow et al., 2013; Kelleher et al., 2017). Support from other parents in the intervention was also an important factor, as previously described by Schalkwijk (Schalkwijk et al., 2015). Our findings confirm other studies in which children voice the wish to integrate with peers and not be bullied anymore (Kelleher et al., 2017; Reece et al., 2015), as well as the desire to change (Watson, Baker, & Chadwick, 2016). One key theme arising from the children's perspective was the importance of having fun and a sense of belonging to the group while performing activities together, as has also been reported elsewhere (Sallinen et al., 2013; Watson et al., 2016).

Strengths & limitations

To the best of our knowledge, this is one of the first studies analysing the perspectives of completers and coaches of interventions for childhood overweight and obesity (Miller & Brennan, 2015; Staiano et al., 2017). In addition, this is one of the few studies in which not only factual characteristics of the participants were addressed, but also their perspectives, experiences and motives (Nobles et al., 2016). By interviewing children, parents and their coaches, we were able to gain in-depth background knowledge of the family stories and gain more insight into the contextual factors that play a role. The theoretical model that was created as the basis for this study facilitated the structuring of the factors related to participation and completion and was useful in collecting and analysing data. However, further research is needed to validate this model. The literature search was performed in a single database, and although additional snowballing was used, it is possible that this may have narrowed down adaptable factors that were identified. One limitation of this study is its sole focus on completers. This was partly addressed by discussing reasons for the attrition of other intervention participants with the coaches. In addition, only a few participants recalled the referral process in detail. Further research should compare the perspectives of completers with those of dropouts, preferably in a prospective study, in which potential intervention participants are followed from the moment of referral.

Conclusion

Professionals should use a personalized approach in facilitating guidance towards, adherence to and completion of interventions for children with overweight and obesity and their parents. This is especially important for families who are coping with complex circumstances, who are likely to encounter more barriers than facilitators to their participation in and completion of such interventions.

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Authors EvE, JH and JS were involved in the development and implementation of the LEFF intervention through which part of the study participants were recruited.

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Data Availability Statement

The data that support the findings of this study are available from the corresponding author, EvdE, upon reasonable request by e-mail.

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