

Practice Article

Training program for overweight prevention in the child's first year: Compilation and results

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Abstract

The current local overweight-prevention protocols are not applied as intended by Dutch child healthcare physicians and nurses. The development of a training program for these practitioners, based on the Intervention Mapping framework, with the aim of improving overweight-prevention in a child's first year, is described in this study. The needs assessment showed three program objectives to be relevant, namely improving: (i) awareness of the importance of early overweight-prevention; (ii) the competence to discuss (the risk of) overweight with parents; and (iii) working systematically according to the overweight-prevention protocol. A matrix was then created specifying the program objectives in terms of personal learning objectives and environmental change objectives, and appropriate strategies were identified. The results suggested that a more active tailored and structured change strategy improves knowledge and skills, in particular, which results in a better overall implementation of the overweight-prevention protocol. This training program should help providers understand how the implementation of a protocol, such as the overweight-prevention protocol, can be improved. Using the Intervention Mapping framework for systematic protocol implementation seems a valuable option.

Key words

child healthcare practitioner, the Netherlands, overweight-prevention, training program.

INTRODUCTION

Overweight in children is recognized as a major public health concern because of the associated lifelong health consequences, such as metabolic syndrome or cardiovascular diseases (WHO, 2000; Allemand-Jander, 2010; Reilly & Kelly, 2011). In addition, there is evidence that a child's first year is an important period for the prevention of overweight (Gluckman & Hanson, 2004; Barker, 2007). It is in this first year that the foundations are laid for lifestyle behaviors that might track throughout children's lives and impact on adult weight (Singh *et al.*, 2008). It is thus clear that overweight-prevention programs in this early period are important, and that they should focus on the parents, as they are the ones who lay the foundations for their child's healthy lifestyle (Kelder *et al.*, 1994).

In the Netherlands, there is a system, known as child health care (CHC) that supports parents by providing a free-of-charge nationwide program of regular preventive health checks. The CHC service monitors the growth and

development of more than 95% of Dutch children from birth to the age of 19 years. In view of the increasing prevalence of overweight among children, CHC has developed national overweight-prevention guidelines to address this problem (Dunnink *et al.*, 2008). These guidelines focus on the following activities to manage the problem of overweight: (i) monitoring the growth of the child and early detection of abnormal growth patterns; (ii) identifying overweight children; (iii) preventing overweight; (iv) advice about nutrition for children aged 0–4 years; and (v) supporting breastfeeding. At the local level, CHC services translate these guidelines into their own organizational overweight-prevention protocols, which serve as an intervention strategy to manage the problem of overweight. However, the success of such a protocol depends on its implementation (Grol, 2001). A number of barriers, such as a lack of knowledge, skills, time, and organizational support, can hamper the proper implementation of protocols (Fleuren *et al.*, 2004; Campbell *et al.*, 2000).

The results of several studies have shown that there is a need to investigate what can be improved, after which, a systematic and well-planned training program is needed to improve protocol implementation in practice (Haines & Donald, 1998; Brug *et al.*, 2005; Spivack *et al.*, 2010). The training program should address the main barriers relating to CHC practitioners' behavior and the necessary preconditions that can be created by the organization.

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Received 22 October 2012; revision received 4 February 2013; accepted 7 February 2013.

To develop such a training program, we used the systematic Intervention Mapping (IM) (Fig. 1) approach for program development (Bartholomew *et al.*, 2006). In this study, the IM approach is introduced, describing in detail the steps needed to develop such a training program and its results.

INTERVENTION MAPPING

IM provides a framework, based on a combination of theoretical evidence and practical information, which can be used to structure the development of a training program for CHC practitioners (e.g. physicians and nurses). IM is a stepwise approach, each leading to a product that guides the next step. Prior to the IM approach, it is essential to

conduct a needs assessment for a training program and define the content of such a program, in order to address the most important barriers experienced by CHC practitioners and the relevant and changeable behavioral determinants prevalent among them. It then specifies the training goals, which are subdivided into personal and environmental change objectives (CO), and related determinants. Subsequently, theoretical methods are selected to change the behavioral determinants, and these are translated into practical strategies that can be used in the training program. This results in the creation of a matrix, which can be regarded as the design of the actual training program (Table 1). The aim of our training program was to achieve satisfactory implementation of the Dutch overweight-prevention protocols for children from birth to 1 year.

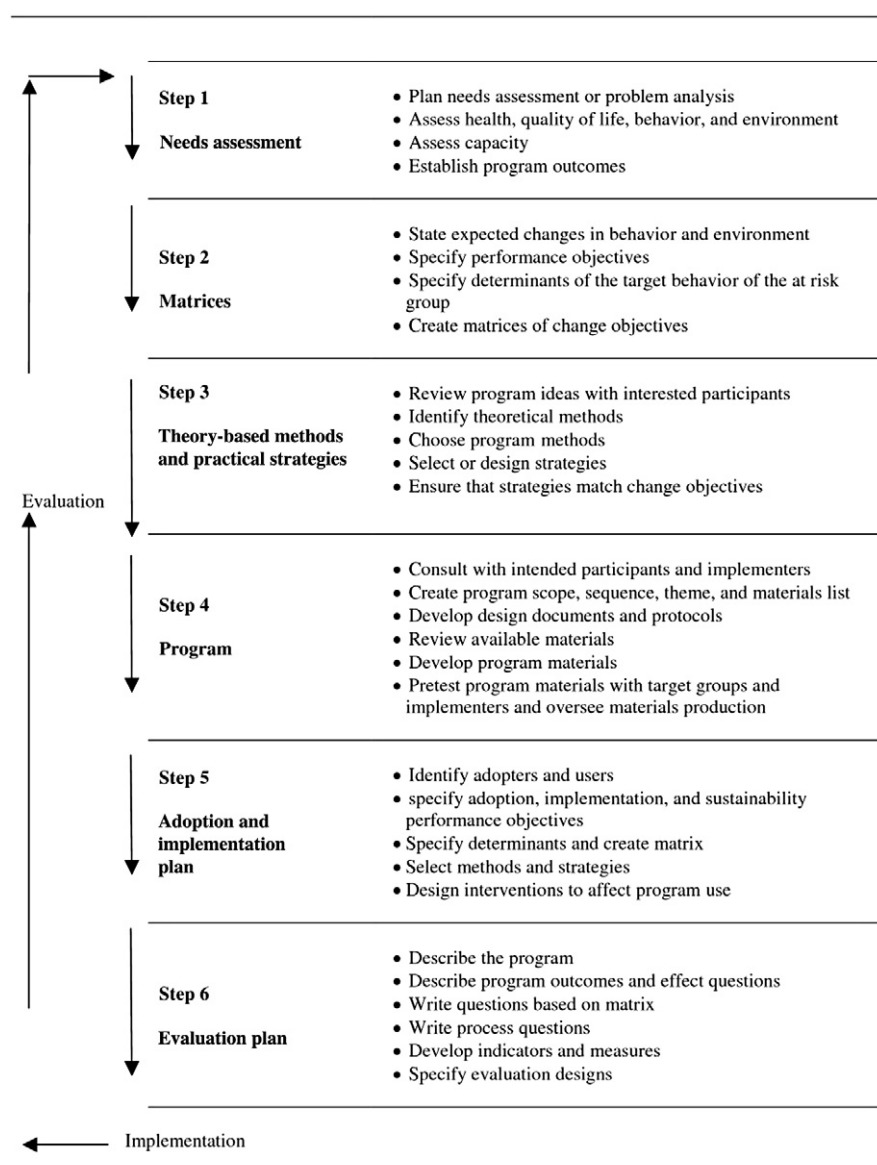


Figure 1. Intervention Mapping protocol (Reproduced from Bartholomew *et al.*, 2006 as recommended).

Table 1. Matrix for the training program

Program objective 1: Being aware that growth and lifestyle behaviors in the child's first year is related to overweight in adulthood		CO		Practical strategies
PO	LO	1. Social Support	2. Barriers	
	1. Knowledge	2. Attitudes		
<p>PO 1.1. CHC practitioner is aware that growth in the child's first year is related to overweight in adulthood</p> <p>PO 1.2. CHC practitioner is aware of setting the fundamentals of lifestyle behaviors in the child's first year</p>	<p>LO 1.1.a.1. Knowledge about normal and abnormal growth patterns in the child's first year related to growth during lifespan</p> <p>LO 1.2. b.1. Knowledge of nutrition related to the development of overweight</p> <p>LO 1.2.c.1. Knowledge of physical exercise behavior related to the development of overweight</p> <p>LO 1.2.d.1. Knowledge regarding environmental influence related to the development of overweight</p>	<p>LO 1.1.a.2. Positive attitude towards early detection of a child at risk for overweight</p> <p>LO 1.2.b.2. Positive attitude towards the development of energy balance-related behaviors</p>	<p>CO 1.1.a.1. Prioritizing the prevention of overweight by the organization</p> <p>CO 1.1.a.2. Facilities at work</p> <p>CO 1.2.b.1. Organization delivers and gives access to information regarding nutrition, physical exercise, and environmental factors related to the development of overweight</p> <p>CO 1.2.b.2. Market development and influence of the market on parents</p>	<p>Transfer of information by an expert, a newsletter, interactive group meetings, individual observation</p> <p>Transfer of information by an expert, a newsletter, interactive group meetings</p>
	<p>LO 1.3.e 1. Knowledge of risk factors</p> <p>LO 1.3. f1. Knowledge to recognize a child at risk for overweight</p> <p>LO 1.3.g.1. Knowledge of overweight and the related short- and long-term health problems</p>	<p>LO 1.3.c.2. Positive attitude towards detecting risk factors for overweight</p>	<p>CO 1.3.c.1. Organization delivers and gives access to information regarding risk factors related to overweight</p>	<p>Transfer of information by an expert, a newsletter, interactive group meetings</p>
	<p>LO 1.4.b. 1. Knowledge of social-cultural aspects related to the development of a healthy lifestyle</p>	<p>LO1.4.d.2. Positive attitude towards the relation of social-cultural aspects related to the development of overweight</p>	<p>CO 1.4.d.1. Organization delivers and gives access to information regarding social-cultural aspects</p>	<p>Transfer of information by an expert, a newsletter, interactive group meetings</p>

Table 1. Continued

Program objective 2: Reducing the difficulty in discussing (the risk of) overweight with parents		CO				Practical Strategies	
PO	1. Knowledge	2. Skills	LO	4. Outcome expectations	1. Social support	2. Barriers	
			3. Self-efficacy				
PO 2.1. CHC practitioner discusses the risk of overweight with parents	LO 2.1.a.1. Knowledge about communication techniques	LO 2.1.a.2. Able to perform communication techniques in practice and reflect about their own communication techniques	LO 2.1.a.3. Express confidence to discuss the risk of overweight with parents	LO 2.1.a.4. Expectations with regard to discussing the issue of risk of overweight with parents LO 2.1.b.4. Expectation that their advice influences parents	CO 2.1.a.1. Reflection and feedback from colleagues CO 2.1.b.1. Organizational support and providing training facilities for communication techniques	CO 2.1.a.2. Consultation time	Transfer of information by an expert, a newsletter, training MI, interactive group meetings, individual observation, feedback and reflection, time to practice
PO 2.2. CHC practitioner motivates parents regarding a healthy lifestyle for their child	LO 2.2.b.1. Knowledge about motivational communication techniques and stages of change	LO 2.2.b.2. Able to motivate parents with respect to the development of a healthy lifestyle	LO 2.2.b.3. Express confidence in motivating parents	LO 2.2.c.4. Expectations that motivating parents will affect the development of a healthy lifestyle of the child LO 2.2.d.4. Expectation that their advice influences parents	CO 2.2.c.1. Reflection and feedback from colleagues CO 2.2.d.1. Organization provides information and preconditions to practice communication techniques	CO 2.2.b.2. Consultation time	Transfer of knowledge about MI, training skills according to MI, individual consultation, feedback and reinforcement
PO 2.3. CHC practitioner discusses the growth pattern of the child with the parents	LO 2.3.c.1. Knowledge of growth curves and how to explain them to parents	LO 2.3.c.2. Able to discuss the growth pattern of the child with parents	LO 2.3.c.3. Express confidence in discussing the growth pattern with parents	LO 2.3.e.4. Expect that discussing the growth curve with parents influences their perceptions and actions of parents	CO 2.3.e.1. Reflection and feedback from colleagues CO 2.3.f.1. Organization provides information and preconditions for using the growth curve	CO 2.3.c.2. Consultation time	Interactive group meetings, individual observation, feedback and reinforcement
PO 2.4. CHC practitioner deals with experienced resistance of parents regarding the topic of overweight	LO 2.4.d.1. Knowledge of communication techniques regarding how to deal with experienced resistance	LO 2.4.d.2. Able to discuss overweight with parents, even when the practitioner experiences resistance	LO 2.4.d.3. Expresses confidence about how to discuss overweight when resistance from parents is experienced	LO 2.4.f.4. Expectation that even if resistance is experienced, discussing the topic will influence the perceptions of parents	CO 2.4.g.1. Reflection and feedback from colleagues CO 2.4.h.1. Organization preconditions regarding practicing communication techniques	CO 2.4.d.2. Consultation time	Apply the MI technique, interactive group meetings, individual observation, feedback and reinforcement

Program objective 3: Working systematically according to the overweight protocol

PO	Personal determinants				Organizational I determinants		Practical strategies
	1. Knowledge	2. Skills	3. Self-efficacy	4. Outcome expectations	1. Social Support	2. Barriers	
PO 3.1. CHC practitioner uses the organizational overweight protocols in practice	LO 3.1.a.1. Knows the organizational protocols	LO 3.1.a.2. Skills to translate the protocol in practice, and is able to find information regarding the overweight protocols	LO 3.1.a.3. Expresses confidence in using protocols in practice	LO 3.1.a.4. Expectation that the use of overweight protocols contributes to better performance in practice	CO 3.1.a.1. Discusses overweight protocols with colleagues CO 3.1.b.1 Involvement of practitioners by implementing overweight protocols CO 3.1.c.1. Facilitates in preconditions CO 3.2.c.1. Organization provides tools for working systematically CO 3.2. d.1. Discusses working systematically with colleagues	CO 3.1.a.2. Time to get familiar with overweight protocols CO 3.1.b.2. Routine CO 3.1.c.2. Positive reinforcement CO 3.2. d.2 Consultation time, other priorities during the consultation	Transfer of information about the overweight protocol, protocols are easily accessible by the organizational digital system, interactive group meetings
	PO 3.2. CHC practitioner works systematically according to the protocols	LO 3.2.b.1. Knowledge about working systematically during a consultation	LO 3.2.b.2. Able to work systematically in practice, demonstrate use of strategy and registration	LO 3.2.b.3. Expresses confidence their own performance of working systematically	LO 3.2.b.4. Expectation that working systematically enables better performance in practice	CO 3.1.c.1. Facilitates in preconditions CO 3.2.c.1. Organization provides tools for working systematically CO 3.2. d.1. Discusses working systematically with colleagues	CO 3.1.c.2. Positive reinforcement CO 3.2. d.2 Consultation time, other priorities during the consultation
PO 3.3. CHC practitioner uses additional possibilities; for example, an extra consultation	LO 3.3.c.1. Knowledge about additional possibilities	LO 3.3.c.2. Skills to manage additional possibilities in practice	LO 3.3.c.3. Expresses confidence in using the additional materials	LO 3.3.c.4. Expectation that additional possibilities can be supportive	CO 3.3.e.1. Organization provides flexibility of additional possibilities in order to deliver tailored care	CO 3.3.e.2. Time to perform an extra consultation, home visit or phone call	Individual observation, interactive group meetings, feedback and reinforcement
PO 3.4. CHC practitioner uses additional materials; for example, supportive brochures	LO3.4.d.1. Knowledge about the materials presented in the overweight protocol	LO 3.4.d.2. Skills to use materials in practice	LO 3.4.c.3. Expresses confidence in using the additional materials	LO 3.4.d.4. Expectation of effects of the additional materials	CO 3.4.f.1. Organization facilitates in additional materials CO 3.4.g.1. Discusses the use of materials with colleagues CO 3.5.h.1. Organization supports uniformity between colleagues when detecting a child at risk for overweight CO 3.5.i.1. Organization provides tools for detecting children at risk	CO 3.5.f.2. Difficulty in detecting children at risk for overweight	Transfer of information about additional materials during meetings and in the newsletter; additional materials, such as brochures are easily available Transfer of information, especially regarding the growth curve and detecting a child at risk; use of the registration system; interactive group meetings; individual observation; feedback and reinforcement
PO 3.5. CHC practitioner detects and registers children at risk for overweight	LO 3.5.e.1. Knows about measures to detect a child at risk for overweight, specifically the growth curve and hereditary and environmental risk factors, such as the BMI of the parents	LO 3.5.e.2. Interpretation of the growth curves and the risk factors in order to detect a child at risk for overweight	LO 3.5.d.3. Expresses confidence in detecting children at risk for overweight	LO 3.5.e.4. Expectation that detecting children at risk for overweight is necessary in order to manage overweight-prevention	CO 3.6.g.1. Provides information about unhealthy lifestyles CO 3.7.k.1 Organization provides the information and tools for detecting children at risk	CO 3.6.g.2. Market development	Transfer of information by newsletter, content articles, and meetings; protocols are easy accessible by the organizational digital system; use of the registration system Transfer of information about registration and the growth curve by newsletter, content articles, and meetings; use of the registration system
PO 3.6. CHC practitioner detects and registers parents or child with an unhealthy lifestyle	LO 3.6.f.1. Knowledge about an unhealthy lifestyle	LO 3.6.f.2. Able to intervene when an unhealthy lifestyle is detected	LO 3.6.e.3. Expresses confidence in being able to detect an unhealthy lifestyle	LO 3.6.f.4. Expectation that parents will change their unhealthy lifestyles	CO 3.6.j.1. Provides information about unhealthy lifestyles	CO 3.6.g.2. Market development	Transfer of information by newsletter, content articles, and meetings; protocols are easy accessible by the organizational digital system; use of the registration system Transfer of information about registration and the growth curve by newsletter, content articles, and meetings; use of the registration system
PO 3.7. CHC practitioner detects and registers a child with an abnormal growth pattern	LO 3.7.g.1. Knowledge about normal and abnormal growth patterns	LO 3.7.g.2. Monitors the growth curve and interpretation of the growth curve	LO 3.7.f.3. Expresses confidence in the interpretation of growth patterns	LO 3.7.g.4. Expectation that early detection will enable better overweight management	CO 3.6.j.1. Provides information about unhealthy lifestyles CO 3.7.k.1 Organization provides the information and tools for detecting children at risk	CO 3.6.g.2. Market development	Transfer of information by newsletter, content articles, and meetings; protocols are easy accessible by the organizational digital system; use of the registration system Transfer of information about registration and the growth curve by newsletter, content articles, and meetings; use of the registration system

BMI, body mass index; CHC, child health care; CO, change objectives; LO, learning objectives; MI, motivational interviewing; PO, performance objective.

Development of the training program

Needs assessment

The need for a training program was explored in a qualitative study. Twelve CHC physicians and nurses were interviewed about their current practice regarding overweight-prevention in children's first year and the barriers they encountered regarding protocol implementation. A self-report questionnaire was then developed to investigate the barriers encountered, both in terms of personal behavior and preconditions created by the organization employing them.

Four CHC organizations were approached, with the request to present the questionnaire to their practitioners. Of a total 310 CHC practitioners, 216 completed the questionnaire. The findings from the interviews and the questionnaire identified three major barriers (Dera-De Bie *et al.*, 2012). The first was a lack of awareness among CHC practitioners that a child's first year is an essential period for the prevention of overweight, as a result of which they did not regard the early detection of children at risk for overweight as being of importance during this period. It was also not clear to them when a given weight in the child's first year implied an increased risk for developing overweight. This might have affected their ability to identify children at risk. Second, CHC practitioners found it difficult to discuss overweight with parents, especially when they experienced resistance from them. Third, the practitioners did not always sufficiently adhere to a systematic working approach, and this influenced the implementation of the overweight-prevention protocol as intended. For example, the results of history taking and the advice given were not properly recorded, and referral paths and additional materials were often not used as intended.

In sum, the lack of awareness, the difficulty in discussing overweight, and the lack of systematic working methods resulted in the inadequate implementation of the overweight-prevention protocols. In order to tackle these three barriers, we constructed a matrix to serve as the foundation for the training program, following the IM approach. The creation of this matrix involved several steps, as outlined below.

Step 1: Defining program objectives

Based on our needs exploration, we chose the following objectives for the development of the training program: (i) CHC practitioners must be aware that growth and the development of lifestyle behaviors in a child's first year will affect their weight during the rest of their lives, so that early prevention of overweight is important; (ii) CHC practitioners must be able to discuss overweight (or at risk for overweight) with parents; and (iii) CHC practitioners must work systematically according to the organization's overweight-prevention protocol.

Performance objectives and determinants

Attaining these three training objectives requires specification of what the CHC practitioner has to learn in order to attain them, and what has to be changed in their working

environment, that is, the organization. To this end, the training program should distinguish between personal learning objectives (LO) and environmental CO.

With regards to the LO, awareness can be promoted by new knowledge that positively influences attitudes. Relevant determinants to reduce the difficulty of discussing overweight are knowledge, skills, self-efficacy, and outcome expectations. The same determinants are relevant for working systematically to implement the protocol (LO). Regarding the environmental CO, social support and barriers within the organization were identified as the most important determinants.

Step 2: Selection of theoretical methods and practical strategies

For each determinant, we identified appropriate theories and change methods from the literature. The relevant theories we selected for the training program were primarily adapted from Bandura's Social Cognitive Theory, Weinstein's Precaution Adaptation Process Model, the Elaboration Likelihood model, and the model developed by Fleuren and Paulussen (Bandura, 1986; Petty & Cacioppo, 1986; Paulussen 1994; Weinstein & Sandman, 2002; Bandura, 2004; Fleuren *et al.*, 2004; Bartholomew *et al.*, 2006).

The needs assessment showed that it was knowledge and skills, in particular, regarding communication techniques that were lacking. In order to change these determinants, we focused on two overall strategies: repetition of information and frequent and consistent practice of communication skills. Changing the level of a person's knowledge and skills takes a certain amount of time before a new behavior is generated, so we opted for an annual schedule with regular training activities to change these determinants.

Knowledge transfer can be supported by information provided by experts, interactive group discussions between CHC practitioners, guided practice, and feedback. These activities stimulate the process of active learning and help to tailor relevant messages to the CHC practitioners' routine practice (Petty & Cacioppo, 1986; Bartholomew *et al.*, 2006). Moreover, knowledge is a precondition for changing a practitioner's attitude in terms of awareness of the risk of overweight in infants (Bandura, 1986, Weinstein & Sandman, 2002). CHC practitioners should be aware that a chubby child or a child with an abnormal growth pattern in the first year can be at risk for being overweight.

As a technique to address the lack of communication skills, we opted for motivational interviewing (MI), because motivating parents is one of the most important determinants of treatment success (Miller & Rollnick, 2002; Fransen *et al.*, 2008). In addition, the topic of "overweight" is emotionally charged, because of the sense of personal responsibility among parents and their experience of "failure" in raising their child, their experience of their own weight, the feeling of stigmatization, and negative attitudes associated with the topic in Western societies in terms of "blaming the victim". Successful communication is a prerequisite for consultations between CHC practitioners and parents, which aim to change parents' perceptions regarding their child's risk of developing overweight and related factors, such as the food behavior or

limited physical activity (Eckstein *et al.*, 2006; Jansen & Brug, 2006). MI, interactive group discussion, guided practice, and feedback are strategies that can be expected to influence knowledge, skills, self-efficacy, and outcome expectations (Bartholomew *et al.*, 2006). Self-efficacy and outcome expectations refer to a CHC practitioner's perception of their competence and their confidence to discuss the risk of overweight with parents. Lack of confidence in parents' adherence to CHC advice inhibits the CHC professional from giving advice. Routine questions at the first consultation about the parents' height and weight, their body mass index and lifestyle, and raising the child in a healthy way can contribute to normalizing the discussion about weight and overweight.

A systematic working approach can be achieved if CHC practitioners possess the relevant knowledge about the existence and content of the overweight-prevention protocol. Repeated promotion of the protocol by various sources, such as the organization's newsletter, giving attention to the topic during organization meetings, opportunities to ask questions online, and observations of individual CHC practitioners' performance during consultations with feedback, can increase not only the practitioners' knowledge, but also their skills, self-efficacy, and outcome expectations (Bartholomew *et al.*, 2006).

In addition, practitioners should be shown how to use the overweight-prevention protocol in practice, which could be accomplished by interactive group discussions and individual observation sessions during consultations. This encourages CHC practitioners to reflect on their own, and each other's work, as they gain more insight into their own blind spots and routines. This also results in more agreement and uniformity about what and how to record in the electronic child records.

With regards to environmental CO, the implementation of the local overweight-prevention protocol by CHC practitioners can be improved by social support from management and by the removal of barriers; for example, by allowing sufficient time for extra consultations. These strategies are expected to contribute to an active self-learning culture within the organization, and encourage CHC practitioners to practice their skills repeatedly.

Another way to contribute to the implementation of the overweight-prevention protocol in practice is to prioritize the topic on the organizational agenda and embed the training components into the organization's plan-do-check-act cycle (PDCA) (Alemi *et al.*, 2000). For example, the recording of risk factors, advice, and referral in electronic child records should be obligatory and monitored by management. Feasibility barriers, such as time constraints, can be influenced by improving practitioners' skills to structure consultations, as this results in faster problem analysis. Positive reinforcement by management will also boost CHC practitioners' motivation. The specification of steps 1 and 2 resulted in a matrix (Table 1), which served as the basis for designing the training program.

Step 3: Designing the training program

The training program we designed consisted of eight components: (i) a kick-off meeting; (ii) an expert meeting; (iii) a

skills training course for the MI technique; (iv) interactive group meetings; (v) observations of individual practitioners' performance by a trainer; (vi) newsletters; (vii) related articles; and (viii) opportunities to ask questions by mail or telephone.

The training program started with a kick-off meeting with managers and CHC practitioners to inform them about the training program. At the next meeting, an expert provided information about the topic, and special attention was given to the subject growth in the child's first year. This was followed by a 2 day session to develop the CHC practitioners' skills in applying the MI technique. Regular interactive group meetings already exist for CHC physicians, but not for CHC nurses, and they have now been introduced in the program for nurses as well. The topic of prevention of overweight was put on the agenda of these interactive group meetings. With regards to the group discussions, all CHC practitioners had to write a case story by systematically describing the problem, its analysis, and proposed interventions.

The training program also included two observation sessions to assess the individual CHC practitioners' performance. A special assessment form was developed for this purpose, addressing history taking, recording, consultation structure, knowledge, verbal and non-verbal communication techniques, and questions for parents. This procedure is a normal method in the Dutch healthcare system to assess the quality of someone's performance and to identify opportunities for improvement. The regular interactive group meetings with colleagues, individual observation sessions, and feedback related to daily work in CHC practice is intended to create new routines among CHC practitioners.

Step 4: Adoption and implementation

The intended participants of the training program were all CHC physicians and nurses of the CHC services in the southern part of the Netherlands (Maastricht region). If the CHC practitioners were to adopt the overweight-prevention protocol, they must perceive benefits of the new working method, and the training program must fit in with their daily work flow.

As part of the training program, a manual was produced offering instructions, and new materials were developed, such as a flowchart showing the items to be recorded in the electronic child records. To stimulate the adoption of the new working methods in routine practice, the training components were embedded in the CHC organizations' regular training course structure. A supervisor was responsible for ensuring that training components were embedded in the organizational PDCA cycle.

Step 5: Evaluation

The training program was evaluated in terms of process and effect evaluation. The process evaluation was based on a logbook that served as a guide throughout the training. This logbook included an evaluation of the content and organization of the training program. From the evaluation of the MI,

Table 2. Profile of the participants. Characteristics of child healthcare (CHC) physicians and nurses

Area	Maastricht intervention group	Heerlen Control group	Sittard control group
Total practitioners ($n = 105$)‡/characteristics	33	44	28
Response	$n = 21$ (63%)	$n = 26$ (59%)	$n = 14$ (48%)
Profession†			
CHC physician	7	11	6
CHC nurse	14	15	8
Females†	18	25	14
Males	3	1	0
Mean age	51 (SD: 41–61)	46 (SD: 35–66)	48 (SD: 34–60)
Years in profession	14	11	13
Average working hours	19	21	22

†CHC physicians or nurses specialized in the early growth and development of children aged 0–4 years. ‡Of a total 105 practitioners working in the CHC services in the southern Limburg district, 101 are female and four are male. Practitioners in the Netherlands working for CHC organizations for children aged 0–4 years are almost all female. SD, standard deviation.

training practitioners mentioned that there was a greater need for skills training in discussing difficult subjects with parents. In addition, the interactive group discussions and individual observations were perceived by the CHC practitioner as very useful training components in order to gain more knowledge and training skills.

Regarding the effect evaluation, a quasi-experimental design with an intervention group and control group was used to assess the effectiveness of the training program. A self-report questionnaire was completed at baseline and follow up (1 year). This questionnaire consisted of 105 items on five-point Likert scale and background information about the CHC practitioner. Of a total 105 CHC practitioners, 61 completed the questionnaire (Table 2). Reasons for dropout after the first baseline measure were retirement of practitioners, natural course, sick leave, holiday leave, or pregnancy.

For each item on the five-point Likert scale, the answers were computed so that follow-up answers were subtracted from the answers at baseline. Additionally, for each individual question, a paired-sample *t*-test was performed. The main outcome showed that there was a more positive increase by the intervention group than the control group regarding: (i) awareness of the importance of prevention, especially for the child's first year; (ii) knowledge of protocols, which seemed also to affect a more systematically-working approach and a better use of relevant materials in practice; and (iii) less difficulty with respect to discussing the topic of overweight with parents (Table 3). Moreover, CHC practitioners from the intervention group mentioned that the overweight-prevention protocol was more embedded in the organizational PDCA compared to the control group.

In summary, the training positively impacted the three program objectives. The hypothesis, that a more active training strategy will favorably influence the behavior of the CHC practitioners in terms of improving the implementation of the overweight-prevention protocol, seemed to be confirmed.

DISCUSSION

The aim of our study was to develop a tailored training program for CHC practitioners focusing on children's first year of life in order to improve the implementation of overweight-prevention protocols. So far, only a few studies have addressed the barriers encountered by healthcare practitioners in the implementation of early overweight-prevention. Even fewer studies have addressed the problem of how to change or address the perceived barriers in practice in order to manage early overweight-prevention (Ashby *et al.*, 2012).

The IM concept provides a theory-based and practical aid for the development, implementation, adaptation, and evaluation of training programs to support protocol use in daily practice (Bartholomew *et al.*, 2006). The combination of existing theories and an exploration of routine practice could improve the implementation of protocols. Too often, protocols are designed and implemented without considering how they can be efficiently integrated in everyday practice. The literature shows that a structural and systematic approach is more successful, and the creation of a matrix as part of the IM method provides a clear overview of program components and makes the program more transparent.

The process of IM is iterative and cyclic, rather than linear. In our situation, it promoted a training program matching the needs of CHC practitioners and made it possible to adapt to changes in practice. The development of this training program, following the IM procedure, is transferable to other CHC services. It might be also interesting for other healthcare settings, under the condition that it is tailored to the needs of the target population, that is, healthcare practitioners.

Although IM is a time-consuming process, it forces designers at an early stage to reflect on feasibility and continuation of the program, and provides a useful checklist to relatively quickly tailor an existing protocol. To reduce time investment, we used previously-developed activities and materials. This also helped us avoid "reinventing the wheel", which

Table 3. Main changes of the questionnaire items

Questionnaire items/scores	Negative	0	Positive	1	Negative	0	Positive	2	Negative	0	Positive	2
Opinion of consultation of parents regarding the risk of developing overweight												
How important is consultation about the child's first year and the risk of overweight?	1	10	11	0.004†	8	11	7	0.866	3	4	7	0.336
How important is consultation after the child's first year and the risk of overweight?	2	14	6	0.110	7	14	5	0.395	5	8	1	0.088
I do not find it difficult to discuss overweight with parents if:												
A parent is overweight themselves	4	6	12	0.273	6	13	7	1	2	5	7	0.068
A parent has less knowledge about overweight	5	7	10	0.300	6	15	5	0.559	4	2	8	0.095
I do find the right tone to discuss overweight with parents	7	4	11	0.308	8	11	7	0.731	4	5	5	0.292
I have enough skills to keep up parents' motivation to develop a healthier lifestyle	7	5	10	0.602	7	16	5	0.260	1	9	4	0.139
I am familiar with the guidelines preventing overweight	1	5	16	0.000†	6	9	11	0.065	4	8	2	0.487
I am familiar with the guidelines identifying overweight	4	8	10	0.249	7	10	9	0.461	4	7	3	0.068
Questions about the use of relevant materials												
I use the flow chart for children aged 0–1	4	8	10	0.518	8	12	6	0.416	2	9	3	1
I use the flow chart for children above 1 year and older	5	11	6	1	10	11	5	0.274	3	6	5	0.721
I always count the BMI of the child	3	11	8	0.379	9	15	2	0.053	2	11	1	0.583
I always use the brochure of the Dutch Nutrition Centre	1	16	5	0.162	12	11	3	0.038	1	12	1	1
Questions regarding implementation of the overweight protocol												
I have difficulty changing routine practice	8	11	3	0.172	5	14	7	0.205	5	3	6	0.189
It is clear how the overweight protocol has been developed	1	9	12	0.072	4	15	7	0.687	6	3	5	0.278
My organization yearly reviews the protocol overweight	1	6	15	0.000†	7	14	5	0.858	5	6	3	0.775
My organization yearly evaluates and readjusts the protocol overweight	2	9	11	0.006†	6	14	6	0.875	3	6	5	0.302

PST, paired-samples *t*-test: baseline measure compared with follow-up measure. †Main remarkable changes. BMI, body mass index. 1 intervention group 2 control group.

would have used up even more resources and time. The format of the training program we developed allows CHC practitioners to introduce cases and questions as part of their training that are closely related to their practice, which supports them in becoming familiar with the protocol.

The IM protocol states that it is not only the environment that must change, but also the behavior of the CHC practitioner themselves. The relationship between CHC practitioners and parents is currently changing from a rather paternalistic one to one of collaborative partnership. In addition, healthcare organizations are currently supporting a self-management approach for chronic diseases, such as over-

weight. This requires the CHC practitioners to develop different skills and competences relating to communication techniques. These skills can also be used for other CHC health issues, such as asthma or eczema (Cabana *et al.*, 2006). Without the necessary knowledge and skills, a CHC practitioner might not be able to effectively counsel parents about appropriate healthy lifestyle behaviors. We took this into account when we translated the program objectives into performance, learning, and CO. Yet it is important that the organization for which a CHC practitioner works supports the implementation of the overweight protocol, by creating the necessary preconditions and removing barriers.

However, the training program has some limitations. It is difficult to control external conditions that influence a practitioner's practice, such as CHC policy changes or the development of fast-food baby products. An affordable theory-based training program that can be performed in daily routine practice is easier to implement and achieves improvement in the management of children at risk of overweight. Efforts to develop training programs aimed at behavioral and organizational change are known to often lack underlying theoretical approaches. Similarly, the current CHC practice lacks a systematic approach, and there is an overload of new protocols being implemented in CHC organizations (Fleuren *et al.*, 2010). CHC practitioners value the presence of a supervisor, who should not only coordinate the implementation of the prevailing overweight-prevention protocol, but also further optimize the protocol and its use in routine practice. Yet it must be clear what the responsibilities and competences of the supervisor are, such as a mandate for protocol implementation and related tools.

In conclusion, IM might be a valuable tool for the development of planned training programs for protocol implementation, as it identifies barriers and necessary training components, and makes protocol implementation, such as the overweight-prevention protocol, more transparent for other healthcare practitioners. The developed training program seems to be more effective than current "care-as-usual" protocol implementation, and it contributes to a better application of early overweight-prevention in CHC daily practice. Embedding a structured, tailored training program for protocol implementation into the organization's PDCA cycle might also increase its effectiveness.

Implications for practice

A more theory-based systematic protocol implementation strategy can improve protocol application in practice. CHC practitioners should also be supported by their organization regarding knowledge and skills related to overweight-prevention in order to improve preventive overweight care by children.

ACKNOWLEDGMENTS

We would like to thank all CHC practitioners who took part in this study. This study and the development of the Academic Collaborative Centre for Public Health Limburg were supported by a grant from the Netherlands Organization for Health Research and Development (ZonMw; project number 7125.0001).

CONTRIBUTIONS

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