

OBESITY AND RELATED DISORDERS

Facilitators and barriers to a dietitian-implemented blended care weight-loss intervention (SMARTsize): a qualitative study

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Introduction

Mean body mass index (BMI) has increased worldwide over the past five decades, resulting in a 40% prevalence of being overweight among adults in 2016 ⁽¹⁾. In the Netherlands, around half of the adult population was

overweight in the same year and 14% were obese ⁽²⁾. A maintained weight loss of 5% is considered clinically relevant and leads to a reduced risk of conditions such as type 2 diabetes ⁽³⁾. Dietitians play an important role in the intervention and prevention of being overweight and obesity ^(4,5). The Academy of Nutrition and Dietetics

Abstract

Background: Dietitians play an important role in the intervention and prevention of being overweight and obesity. More and more blended care interventions are being implemented. The present study aimed to evaluate the delivery by Dutch dietitians of a multicomponent, evidence-based weight-loss programme (SMARTsize), including counselling for relapse prevention. The aim of this qualitative study was to identify facilitators and barriers to the delivery of SMARTsize.

Methods: Nine semi-structured interviews were conducted with 10 dietitians who participated in a larger implementation study. Each interview was recorded and transcribed verbatim. Determinants of theory of implementation, including characteristics of the user, the innovation, organisational context and setting, and innovation strategy guided interviews and analysis. Data were coded and analysed using the framework approach.

Results: According to dietitians, the SMARTsize intervention had a positive influence on patients. The main implementation facilitators were the availability of implementation materials, such as a manual, training in relapse prevention and social support from other dietitians. The main barriers to implementation were organisation and financial reimbursement of cooking classes, the belief that patients need more individual counselling in the starting phase, and the unsuitability for people with low levels of health literacy.

Conclusions: Most dietitians considered that implementation of the SMARTsize intervention consisting of e-health, written information and cooking classes and face-to-face counselling is challenging but feasible. Further development of the SMARTsize intervention and implementation tools is needed to lower experienced barriers. It is also recommended that a version of the intervention to be developed that is suitable for patients with lower levels of health literacy.

encourages dietitians to incorporate comprehensive lifestyle measures in their interventions, including diet, physical activity and behavioural strategies. It is recommended that dietitians incorporate behavioural change strategies into daily practice, such as self-monitoring, portion control, goal-setting and problem-solving or relapse prevention techniques⁽³⁾.

Although lifestyle interventions have proven to be effective for decreasing body weight, resulting in health benefits that include cardiometabolic risk, the most important challenge is long-term maintenance after successful weight loss^(6,7). After an initial period of weight loss of at least 6 months, the Academy of Nutrition and Dietetics recommends monthly visits for at least 1 year⁽³⁾. According to a review by Ulen *et al.*⁽⁸⁾, continued professional care is also essential for successful maintenance of weight loss. However, intervention costs may be too high for continued one-to-one counselling. For example, in the Netherlands, only 3 h of dietetic care are reimbursed by health insurance, whereas, in other countries, patients receive no reimbursement at all. Blending face-to-face counselling with e-health components might be an efficient and effective lifestyle intervention method⁽⁹⁾.

As the Dutch government encourages research and practice to cooperate in practice-based research, this qualitative study is part of the implementation study of SMARTsize in which research and dietetic practices closely cooperated⁽¹⁰⁾. The SMARTsize intervention was based on the PortionControl@Home intervention that was developed and evaluated in a randomised controlled trial performed by Poelman *et al.*^(11–13). The results from this trial among 278 participants who were overweight and obese showed significant and clinically relevant short-term weight loss at 3 months after PortionControl@Home in the intervention group [mean (SD) BMI decreased from 32.86 (4.95) to 30.88 (4.73)] compared to the control group [mean (SD) BMI decreased from 32.0 (4.57) to 30.95 (4.69)]. However, once the intervention ceased, the effect was not sustained⁽¹¹⁾. The intervention provides self-management strategies for sustainable changes in dietary behaviour and weight loss emphasising portion size and calorie density of portions^(14,15). It incorporates multiple components, including (i) an interactive website; (ii) self-management workbook; (iii) cooking classes; and (iv) a screening and feedback instrument to assist shaping the physical home food environment. We considered that the implementation of PortionControl@Home complemented with individual face-to-face counselling from a dietitian (usual care) could be an effective and feasible solution for maintaining adequate portion control strategies and weight loss, as well as continued professional care in the prevention of weight regain (Table 1)^(9,12). By blending the e-health

components and written materials with one-on-one counselling, it is possible to give clients more treatment within the same amount of contact time with a healthcare professional. It has been suggested that, when patients are seen regularly by a dietitian after treatment, they relapse less⁽¹⁶⁾. There is also a positive association between number of consultations and weight loss^(17,18).

Based on the above, we performed an implementation study in cooperation with 43 Dutch dietitians. The SMARTsize intervention builds on the evidence-based PortionControl@Home intervention and was extended with an one-on-one intake, delivery of cooking classes, and one-on-one counselling sessions by the dietitian focusing on maintenance and relapse prevention. Because implementation of an evidence-based intervention in a real-world setting comes with many challenges, we aimed to qualitatively explore beliefs, experiences and opinions of participating dietitians on the delivery of SMARTsize. We aimed to identify facilitators and barriers to the delivery of the intervention programme in practice. This will inform future blended interventions aiming to provide efficient, effective and affordable care for patients who are overweight or obese.

Materials and methods

Participants and procedure of the SMARTsize implementation study

The results of the quantitative process evaluation are described elsewhere⁽¹⁰⁾. In brief, 43 Dutch dietitians working in primary care, located all over the country, representing urban and rural areas, participated in the present study. They all provided their written informed consent and declared the intention to deliver the SMARTsize intervention to approximately seven overweight patients. All dietitians took an e-learning course on the principles of the SMARTsize intervention and a 1-day group training course on skills and strategies for relapse prevention. They were provided with a detailed manual containing background information and instructions for the cooking classes together with all intervention materials. Dietitians recruited their own patients for the SMARTsize intervention study. Patients were provided with clear information on the intervention, including the planning and delivery of blended care components, and their participation in the study following the ethical standards for research. Eligibility criteria for patients were: patients currently not receiving treatment for weight loss with a BMI ≥ 25 . Exclusion criteria were: eating disorder, renal failure, heart failure, insulin use of >2 dosages per day. As an incentive, patients received a free copy of the 'SMARTsize book', which was one of the intervention components⁽¹⁹⁾. The individual consultations were

Table 1 Outline of the blended care intervention SMARTsize

| Intervention | Name component | Timepoint | Mode of delivery | Description of content and aim |
|--|-----------------------------------|------------|---|--|
| Blended SMARTsize intervention (individual consultations with e-health components, written information and group sessions) | Face-to-face intake | Week 1 | Individual consultation by dietitian | Assessment of eligibility and explanation of (study) procedure and goals of the treatment. Patient informed consent |
| | PortionControl@Home (12 weeks) | Week 1–12 | Online tools to increase knowledge and awareness of portion sizes | (i) Change in food portions over time; (ii) Reference serving sizes; (iii) Self-tests; (iv) Package and portion sizes; (v) Energy density; (vi) Child servings; (vii) Daily recommendation servings; (viii) Videos on selection and consumption of large food portions |
| | Self-management book* | Week 2 | Textbook | Portion control strategies based on behaviour change techniques (e.g. monitoring, goal-setting, action planning, coping planning) |
| | Cooking classes* | Week 3–10 | 2 or 3 Groups sessions guided by a dietitian | Demonstrations of appropriate servings of common foods and preparation of meals lower in energy density. Peer discussions and skills training |
| | Homescreener* | Week 8–10 | Online or in paper-and-pen format | Screening and feedback instrument that assists individuals to shape a home food environment that supports adequate portion control behaviour |
| | Counselling on relapse prevention | 3–9 months | Individual consultations by dietitian | Consultations conducted following professional expertise and usual practice of dietitian. Dietitians were encouraged to pay special attention to relapse prevention and maintaining adequate portion control behaviour |

*Intervention components of evidence based PortionControl@Home intervention^(11–13,19).

financially reimbursed by the patients' healthcare insurer to facilitate dietitians in organising the cooking classes, reimbursement of rental fees was available (maximum of €150 for three classes). Dietitians received accreditation for training and participation in the implementation study. During the implementation, a Facebook community was created to facilitate interaction between dietitians. The research team did not contribute to discussions in this community.

Design and participants

Ten interviewees were recruited out of the 43 dietitians, seeking a variety of type of practice (e.g. solo/group/in-company/cooperative), years of experience and variation in the number of included participants in the SMARTsize

intervention. Twelve dietitians were approached by e-mail. Two of them declined because of a lack of time. Two dietitians (numbers 2 and 3) (Table 2) were interviewed together because they collaborated in the organisation and delivery of the cooking classes and preferred a joint interview. The other eight interviews were conducted individually. Interviews were conducted at a time and location convenient for the interviewee (at the dietitian's practice, at home and one in a public space). Table 2 provides more details about the participating dietitians. The interviews lasted approximately 36 min (range 15–49 min).

Data collection

The interview guide was developed based on determinants that influence implementation of innovations in health

care⁽²⁰⁾. Topics were formulated at the level of the user (i.e. the dietitian), SMARTsize intervention, context and setting, and implementation strategies. Topics included the preparation of dietitians to implement the programme, recruitment of patients, evaluation of different intervention components, evaluation of implementation materials (i.e. an implementation manual, Facebook community and an implementation website) and recommendations for further development of the SMARTsize programme (Table 3).

During the study, the interview guide was revised after the interviews to allow new items from earlier interviews. Interviews were scheduled until reaching data saturation, when no new topics were discussed.

Data analysis

Each interview was recorded, transcribed verbatim, checked for accuracy (replay listening of the transcript when reading) and anonymised. Field notes of interviews and memos were recorded in a logbook.

Interviews were analysed according to the framework approach⁽²¹⁾. In this method, data are analysed deductively, based on the theoretical background. We used the theory on the determinants of implementation, as described by Fleuren *et al.*⁽²²⁾ along the four broad themes: (i) characteristics of the user; (ii) characteristics of the innovation; (iii) organisational context and setting; and (iv) innovation strategy. Following the framework approach, inductive analysis was added to reflect further on topics discussed with the respondent. Analysis started with familiarisation with the data by reading the transcripts. Next, interviews were analysed thematically⁽²³⁾, along with open coding to allow for new emerging themes.

Generation of codes was iterative and refined throughout. All interviews were coded by two coders (WH and WK), who had face-to-face meetings to discuss and reach consensus on all codes. Study staff (WH, WK and IS) met regularly throughout the analysis phase to discuss emergent issues and themes. After coding seven transcripts, no new codes were added to the coding tree and data saturation was reached after nine interviews. The software Atlas.ti, version 7.5.12 (<https://atlasti.com>) was used to code, organise and select data from transcripts. Brief summaries including representative quotes were abstracted and charted into a matrix. Summaries at the respondent level were created and sent to the individual respondents to check for accuracy and interpretive and descriptive validity. After minor feedback from some respondents, all dietitians gave their consent to report on the findings.

Ethical approval

The medical ethical committee of VU University Medical Center Amsterdam declares that the Medical Research Involving Human Subjects Act does not apply to the study and has waived the need for approval (letter dated 25 May 2015; registration no. 2015.194).

Results

The results are presented in accordance with the four themes: (i) the user: Dutch dietitians; (ii) the innovation: the SMARTsize intervention; (iii) organisational context and setting; and (iv) innovation strategy. An overall view of identified barriers and facilitators to the dietitian-implemented SMARTsize intervention is provided in Table 4.

Table 2 Characteristics of the dietitians

| Dietitian | Experience (years) | Patient care (hours per week) | Type of practice | Cooking classes group × Number of sessions (group size) | Number of patients included | Number of patients who dropped out* | Interview duration (min) |
|-----------|--------------------|-------------------------------|------------------|---|-----------------------------|-------------------------------------|--------------------------|
| D1 | 26–30 | 12 | Solo | 1 × 2 (<i>n</i> = 7) | 7 | 1 | 41 |
| D2 | 21–25 | 20 | Group | 2 × 2 (<i>n</i> = 7, <i>n</i> = 7) | 7 | 1 | 49 [†] |
| D3 | 6–10 | 32 | Solo | 2 × 2 (<i>n</i> = 7, <i>n</i> = 7) | 7 | – | 49 [†] |
| D4 | 11–15 | 16 | In-company | 2 × 3 (<i>n</i> = 9, <i>n</i> = 8) | 17 | – | 29 |
| D5 | 6–10 | 25 | Cooperative | 1 × 3 [‡] (<i>n</i> = 12) | 5 | – | 33 |
| D6 | 11–15 | 8 | Solo | 1 × 2 (<i>n</i> = 6) | 6 | 1 | 38 |
| D7 | 0–5 | 25 | Solo | – | 1 | 1 | 15 |
| D8 | 0–5 | 16 | Solo | 1 × 3 (<i>n</i> = 6) | 7 | 1 | 42 |
| D9 | 21–25 | 20 | Cooperative | – | 0 | – | 23 |
| D10 | >30 | 24 | Solo | 1 × 3 (<i>n</i> = 6) | 6 | – | 37 |

*Before individual counselling.

[†]Duo interview.

[‡]Last cooking session cancelled.

Table 3 Topic list

| Interview section | Interview topics |
|-------------------------------------|--|
| 1 Overall impression | <ul style="list-style-type: none"> ● Personal experiences with the SMARTsize intervention ● Correspondence with expectations prior to implementation ● Perceived outcomes of the intervention for both professional and patient |
| 2 Preparation | <ul style="list-style-type: none"> ● Confidence after preparation to implement intervention ● Required and needed knowledge and skills to implement intervention |
| 3 Use of the SMARTsize intervention | <ul style="list-style-type: none"> ● Opinion/experience of letting the patient start independently and continuing with consultations ● Challenges with implementing SMARTsize ● Perceived patient experiences ● Motivating patients to participate in the intervention ● Satisfaction with implementation in own practice |
| 4 Cooking classes | <ul style="list-style-type: none"> ● Organisation of cooking classes ● Experience with cooking classes ● Motivating patients to participate in cooking classes |
| 5 Book | <ul style="list-style-type: none"> ● Experience with letting the patient work with the book |
| 6 Website | <ul style="list-style-type: none"> ● Experience with letting the patient work with the website |
| 7 Homescreener | <ul style="list-style-type: none"> ● Experience with letting the patient work with the homescreener |
| 8 Implementation materials | <ul style="list-style-type: none"> ● Opinion about the implementation manual ● Experience with Facebook community ● Experience with the implementation website |
| 9 Recruitment of patients | <ul style="list-style-type: none"> ● Evaluation of patient recruitment ● Recruitment methods |
| 10 Evaluation and future | <ul style="list-style-type: none"> ● Overall evaluation of working with SMARTsize ● Use of SMARTsize in the future ● Recommendations for improvement of the program ● Needs to be able to continue working with SMARTsize |

The user: Dutch dietitians

The mean (SD) age of the 10 dietitians was 39 (10.2) years (Table 1). Years of experience ranged from 0 to 30. Most dietitians worked solo or in cooperation with other solo dietitians; one dietitian worked at a business. The mean (SD) number of patients included was 6.3 (14.8); two dietitians did not deliver the SMARTsize intervention because they were unable to recruit any patients.

Most dietitians considered themselves to be experts in the field of nutrition and opined that the focus on portion size and behavioural change fits their profession. They agreed that individual counselling within the SMARTsize intervention is of added value because a dietitian can tailor advice to the needs of the patient. Implementation of the SMARTsize intervention yielded new insights and knowledge for most dietitians. The offered skills training for relapse prevention during the preparation period was considered especially valuable and different from their routines. Furthermore, they emphasised their satisfaction with the evidence-based intervention materials. Some dietitians also stated that implementation of evidence-based practice and participation in research was important to them.

‘Well, what I really liked is participating in a scientific study. Because, within our discipline, I believe it is important to have an evidence-based practice’

(D3)

Although implementation of the SMARTsize intervention was important, the dietitians discussed some drawbacks that mostly involved the time-consuming organisation of cooking classes without financial reimbursement (see organisational context). Some dietitians also expressed that they would have wanted to practice the knowledge and skills they learned in the training course more in a daily setting. One of them stated not being very aware of the content of the innovation.

‘I must say that, partly due to a lack of time, I studied the theory less than I should, than I would have liked to. To really read the book quite thoroughly, and make the method entirely my own, well, I failed to do so. I’d really like to have done more, but yes, the time just isn’t there’

(D4)

Social support proved to be an important facilitator for adoption of the SMARTsize intervention. Two cooperative-based dietitians stated that the distribution of responsibilities and roles facilitated preparation (e.g.

Table 4 Most important facilitators and barriers in implementing SMARTsize intervention

| Level | Facilitators | Barriers |
|------------------------------------|---|--|
| Characteristics of the user | Belief that dietetic intervention could be prolonged into difficult phase of maintenance because less time is spent in the starting phase | Belief that patients need more individual counselling in the starting phase |
| | Training in relapse prevention | |
| | Social support from other dietitians | |
| Characteristics of the innovation | | Intervention materials not suitable for all types of patients (i.e. with low health literacy levels) |
| | | Technical difficulties with website and homescreener |
| Organisational context and setting | Support from management and practical support from business where intervention was implemented | No financial reimbursement of dietitians' hours spent on cooking classes |
| Innovation strategy | Clear implementation manual | Organisation of cooking classes time-consuming (i.e. finding suitable location) |

groceries) and delivery (e.g. giving each other feedback) of the cooking classes. The dietitian who implemented the SMARTsize intervention at a business also indicated that the support given by management was important. Several dietitians discussed wanting to learn from other dietitians by sharing experiences. It was mentioned that the Facebook community was insufficient in facilitating this purpose because some dietitians had no Facebook account or experiences were not shared in the community.

'I think more experiences of a dietitian who knows what they're doing. How does he or she recruit patients, how do they work? So that we can learn from this person' (D7)

'Then there was the Facebook group where, according to us, nothing really happened. [...] Yes, while that was a good opportunity, no one actually did something with that. [...] That is just what I've missed, exchange of experiences' (D5)

Innovation: the SMARTsize intervention

The principle of blended care with the components of the SMARTsize intervention was new to all of the respondents. Many dietitians reported that patients' relative independence during the initial phase of the SMARTsize intervention was different from their routines. The only contact in this period was through the cooking classes. For some dietitians, it was difficult not to provide patients with individual guidance during this period.

'So, during the first 3 months, when they [the patients] actually should be starting with the book by themselves, we kind of needed to keep our hands

off for a while. That was quite difficult, because you are very inclined to give your own interpretation, but okay. Eventually that worked too' (D3)

'Normally I give personalised dietary advice, based on someone's situation and personal preferences, but also based on caloric needs that fit a person' (D2)

Some dietitians considered that their patients had expected intensive guidance during the initial phase of the SMARTsize intervention. They mentioned that the components (book, website) of the intervention were too generic and not customised to the individual needs of the patient. Dietitians stated that the book was easily readable and clear to patients but that patients need to have self-discipline to read the entire book. The book provided too much information that some patients did not read at all. Mentioned barriers for the website included factors related to navigation, login procedures, bugs and dietitians not being able to track the progress of their individual patients. It was often mentioned that patients easily completed the online modules and quizzes, although a drawback was that some patients quickly went through all modules in a short period. Dietitians mentioned that, during the cooking classes, interaction between peers was important for patients. Some dietitians found it hard to give personal attention to individuals because they were busy providing instructions and enabling group discussions. For one dietitian, a major barrier was the absence or withdrawal of patients from the cooking classes. In general, dietitians acknowledged the cooking classes as a valuable element of the intervention:

'It really adds something. I think it is very valuable to keep it in the programme. Even though it takes some effort, but okay' (D2)

It appeared that professionals who emphasised the importance of individual counselling during the SMARTsize intervention had expected more detailed instructions for the individual consultations. In their opinion, the manual did not provide complete and clear information on procedures for relapse prevention counselling (e.g. guidance on number, duration and content of the consultations). A substantial number of dietitians nonetheless acknowledged positive outcomes for patients as a result of the SMARTsize intervention. One dietitian considered that the intervention created more awareness to change long-term lifestyle behaviour.

'I think people start off in a different way. Another kind of motivation, something that really works more long-term' (D4)

The improved awareness of patients about portion size and the obtained skills to prepare lower-calorie, energy dense-meals was frequently mentioned as an accomplishment of the cooking classes and the website.

'Well it certainly gives them a lot of new knowledge. Right, partly new knowledge, insights, and well those cooking classes just can be fun, right?' (D1)

'From gosh it's the same portion, you can eat both servings, but I thought that there was a difference of almost 300 calories. And you can see them think like, oh, so this is an option too, to make small changes' (D6)

In terms of relevance, dietitians stated that the intervention fits the needs of many patients. In particular, the discussion on temptations and portion size during the cooking classes was considered relevant to a broad target group. There is consensus among dietitians that patients need to be motivated to start independently with the book and website and remain engaged during the first weeks. Some dietitians identified independence as a barrier for patients who had no experience following a diet. In their opinion, more experienced patients started more easily. One dietitian thought that the method stimulates awareness in patients who had gone through many attempts to lose weight. Several dietitians considered that the SMARTsize intervention is not applicable for patients with lower levels of health literacy because they are in need of practical advice and guidance, nor is it appropriate for migrants who do not speak the language, or severely obese people for whom the intervention does not provide sufficient guidance at the start of treatment.

'I don't know, if I for instance have some really obese people, I think this programme would not be

sufficient. But, of course, it can be a good addition. Just use a combination of components' (D8)

Organisational context and setting

The dietitians implemented the SMARTsize intervention in their own practice, except for two dietitians who had difficulties with the inclusion of patients. One of them stated that it was not attributable to the materials or instructions but was the result of a difficult population of patients (e.g. non-Dutch-speakers, low health literacy).

'Most of it [non-inclusion] was because of language. Yes, language was actually the biggest problem' (D7)

The eight dietitians who implemented the SMARTsize intervention used different recruitment strategies, such as an interview in the local newspaper, posters, or attempts through the general practitioner.

Four dietitians delivered two cooking classes and four delivered three cooking classes. Most classes were delivered at community centers with kitchen facilities; one dietitian delivered the intervention at a business. For her, this setting facilitated the delivery of the SMARTsize intervention because there was formal ratification from management, a kitchen was available (from the worksite cafeteria), groceries could be ordered in advance, and patients could participate in the cooking classes and consultations (at least partly) during working hours.

'I think that it is more difficult when you have to do it within a practice. It is then a bigger investment to organise the location, the cooking classes, grocery shopping. Yeah, in my company I did not have to do any of that. So that's nice' (D4)

In terms of financial benefits, dietitians acknowledged the profits of the SMARTsize intervention. Dietetic treatment could be continued when patients were further in the action phase and in the maintenance phase, and in need of relapse prevention. According to Dutch law, all citizens are obliged to have individual primary health insurance from a private insurer. Dietetic health care is accessible without referral from a physician, and its reimbursement is covered up to 3 h a year for interventions for overweight and obesity.

'In terms of reimbursed intervention hours, if I first treated them and they had to come back again, then the reimbursed intervention hours would have already been used. Then you would have to say well, it's annoying that you're experiencing difficulties right now, but ...' (D5)

Cooking classes were not reimbursed by insurance, therefore dietitians asked for contributions of 5–10 euros per class per patient. Dietitians stated that patients were willing to pay for the ingredients. Still, dietitians mentioned that reimbursement from insurance could be a facilitator to organise and deliver the cooking classes in future. One dietitian considered that patients' contributions are essential for their sense of commitment.

'Imagine that the insurer is all in, then people will participate more easily [...] however, you need something to keep them motivated to come. I think that they need to pay some kind of contribution'

(D2)

Organisation of cooking classes was time-consuming because dietitians had to find a location with proper facilities, carry out preparations and tidy up afterwards, and there was no reimbursement for them. However, appreciation from patients for the cooking classes was important to dietitians' motivation. Apart from the organisational hassles, most dietitians enjoyed delivering the cooking classes. Mentioned facilitators for delivery and organisation included appreciation of patients, good group interactions, a facilitating manual with clear recipes and time schedules.

'What I found rewarding was when you noticed that people enjoy the cooking class, it just gives you, even though you are not getting paid, it gives you a sort of appreciation and that is rewarding to me as well'

(D1)

As the homescreener was integrated into the website, dietitians had to activate it for each of their patients. For some dietitians, this procedure was unclear. As a result, not all dietitians activated the online homescreener for their patients.

Most dietitians stated that provided materials were sufficient for delivery of the SMARTsize intervention, mentioning that the manual was clear and the training they received beforehand instructive. However, the dietitians often discussed that the interval between training and execution of skills learned in the consultations was too long.

Innovation strategy

Most dietitians would recommend the SMARTsize intervention to their peers, yet there were some concerns. Dietitians stated that the cooking classes are too time-consuming (given the fact that their time to organise and deliver the classes was not reimbursed by health insurance) and that they would not recommend the

SMARTsize intervention to include cooking classes. Others stated that the SMARTsize intervention is less feasible for small practices.

'The whole concept as it is right now? Including the cooking classes? Well I would argue that those cooking classes really take a lot of time and actually [...] if you want to keep it [time spent] enjoyable? That is just very difficult. So I would recommend the SMARTsize intervention without the cooking classes'

(D1)

'That I'm not a huge practice. I do not have that many patients. Therefore, I reckon that that played a role. I would definitely recommend it [SMARTsize]. If you have a large group with many, many dietitians, [...] then you could do everything. I would also probably, could recruit more people and yes definitely would recommend it'

(D7)

Those dietitians who would recommend it stated that greater patient awareness is a benefit of the SMARTsize intervention.

'Yes, I would definitely recommend it. And that motivation, for example [patient name] actually suggests that is skipped over easily. Hey, that sometimes it is difficult yes, but what, what would be wrong with that? So the awareness of people is a lot more triggered [...] So I find them in that sense certainly a good addition to our work and I would definitely recommend it too'

(D2 and D3)

'Yes, that it is an integrated programme with the website module, which gives insights into temptation and portion size'

(D6)

'Yes, I would recommend it [SMARTsize intervention]. I think the book is fun and the website is good. However, I am not sure if you need to do both, the book and the website, they do not complement each other sufficiently. But I think the method is good to use and very practical for the patients'

(D5)

Many dietitians thought more intensive patient counselling during the first 12 weeks could improve future implementation of the SMARTsize intervention. For example, some would have preferred a more elaborated first intake, others would rather have face-to-face contact during the first 12 weeks to monitor their patients better and help them by motivating them to continue with the SMARTsize intervention.

'Yes, of course you can also, eh, make it more of a supplementary function, that you take more time for the intake, where you give advice [...] and where SMARTsize is intertwined. So you make a more comprehensive start with the patient' (D2 and D3)

'I would make a combination of e-learning (website) with face-to-face consultations in the first three months and then ... after that divide the consultations over time' (D1)

'Yes, I would prefer to see the patients in the first three months. [...] So that you have a moment to reflect with the patient, on what have they been doing, how they did it, and were there any problems or difficulties. This gives you a little bit of insight into how actively patients are working with the programme and that they get the feeling that the dietitian is more actively involved' (D5)

Most dietitians considered that single components of the intervention fit regular practice and want to implement these materials to complement their intervention/dietetic care in the future. They reported having used single components or principles of the SMARTsize intervention in their daily routine for overweight patients (e.g. portion size, the book).

Discussion

Dietitians implemented the SMARTsize intervention in their daily practices. They found the SMARTsize intervention effective, as illustrated by better awareness of portion control, weight loss, weight-loss maintenance/relapse prevention and appreciation of patients. However, they found that the intervention was not suitable for all patients (i.e. patients with low health literacy levels). Dietitians experienced two major challenges in delivering the SMARTsize intervention: (i) the shift toward less individual contact with the patient at the beginning to more individual contact later on in the behavioural change process; and (ii) the organisation of the cooking classes.

In terms of the first challenge, dietitians have so far been quite used to the opposite: more individual contact at the beginning and less individual contact later on. During the first phase of the intervention, contact was limited to the one-on-one intake of 30 min and three cooking classes, which, according to the dietitians, did not entirely fulfill the need for individual contact as experienced by dietitians and as expected by patients. Although increased patient autonomy is considered to be a benefit, dietitians considered that more individual contact with patients in the

initial phase of intervention helps guide patients successfully through the intervention; for example, to encourage them to start, keep them motivated by monitoring outcomes (especially positive ones), provide new post-intervention information, or give individualised assignments. Although evaluation of this initial phase of the intervention alone, and without further individual guidance other than the three cooking classes, already showed positive effects on initial weight loss at 3 months in a predominantly obese population⁽¹¹⁾, it is likely that more guidance will strengthen the effects of the initial phase of the SMARTsize intervention. However, given the limited amount of time that dietitians in the Netherlands generally have to treat their patients, it might be a better option to spend this time in the more challenging phase of behavioural change (i.e. continuing and maintaining the weight loss). The SMARTsize intervention is an opportunity to guide patients more within the same amount of time spent by the dietitian. The dietitians in the present study acknowledged that they had to get used to the shift toward less contact in the beginning and more contact later on, and were positive about the attention for relapse prevention. It is also conceivable that more personalised guidance in the initial phase of the intervention can be provided efficiently; for example, by using computer therapy. Research in domains other than weight management (i.e. anxiety and depression) shows that therapist-guided computer therapy requires less therapist time and is as effective as face-to-face counselling⁽²⁴⁾. In searching for cost-effective ways to treat overweight and obese patients, increasing attention is given to blended care interventions, combining face-to-face counselling with other types of interventions. This requires flexibility from health-care professionals. Similarly to the dietitians in the present study, in a study on the experiences of implementing a blended care intervention combining face-to-face physiotherapy sessions with a web-based application, physiotherapists asked for more options to tailor the intervention to the individual patient's needs⁽²⁴⁾. Professional autonomy appeared to be an important determinant of implementation in daily practice. Releasing some control when using intervention elements other than face-to-face sessions might be challenging in the beginning and takes time to get used to⁽²⁴⁾.

With respect to the second challenge, many dietitians indicated that the organisation of cooking classes is time-consuming and requires specific experience and skills. Dietitians noted that patients were enthusiastic about and satisfied with the cooking classes (as shown by good group interactions, awareness and appreciation). The experience of dietitians is in line with results of MacLellan and Berenbaum⁽²⁵⁾, who stated that barriers such as lack of time and resources are significant challenges for implementation. Funding appears to be a prerequisite for

most dietitians. If the SMARTsize intervention was reimbursed by insurance, both recruitment and the organisation of cooking classes would be less of a barrier.

To encourage and promote the use of the SMARTsize intervention in the daily practice of dietitians, it is important to make adjustments. The supporting website needs some improvements to ensure a more user-friendly interface and accessibility. To enhance use of the home-screener, it is also recommended to make it available both online and in print. Our findings further suggest that, for successful large-scale implementation of the SMARTsize intervention, dietitians need more practical tools and guidelines for relapse counselling (e.g. number, time and duration of consults). It is also important to explore ways to make this blended care approach more tailored to the patient, or else healthcare professionals might have the feeling they are providing suboptimal care. The dietitians in the present study who did not succeed to include patients in the intervention perceived low health literacy as a main barrier. Therefore, creating a low health literacy SMARTsize intervention version is needed to reach a broader population.

Strengths and limitations

The in-depths interviews were conducted by a trained interviewer, and were audio recorded and transcribed verbatim. After each interview, interviewers shared their findings with the co-authors to discuss the information and possibilities to enhance the interview guide. Triangulation was used in the coding strategy. Two researchers independently coded the first interviews, discussing their codes until consensus was reached. To strengthen the internal validity of the study, participants received a summary of the interview and were given the opportunity to reflect. The study is limited to 10 interviews; no new topics were discussed after the seventh interview. Furthermore, the study interviewed a diversity of dietitians (e.g. urban or rural setting, private practice or in-company, years of experience) who successfully or unsuccessfully implemented the SMARTsize intervention in daily practice. This gives a clear representation of facilitators and barriers for implementation. During the interviews, dietitians also expressed their beliefs about the opinions of patients and about the efficacy of the intervention. It should be noted that this needs to be investigated further together with the data of the patients themselves.

Conclusions

According to dietitians, the implementation of SMARTsize into regular dietetic care showed positive effects with respect to awareness of portion control, weight loss,

weight-loss maintenance/relapse prevention and appreciation of patients. The availability of diverse materials, dietitian training and social support facilitated implementation. Implementation was mainly challenged by delaying face-to-face counselling to a later phase of behavioural change and by the organisation of cooking classes. It is recommended that the programme be improved further and adjusted with respect to those patients with lower health literacy levels.

Transparency declaration

The lead author affirms that this manuscript is an honest, accurate and transparent account of the study being reported. The lead author affirms that no important aspects of the study have been omitted and that any discrepancies from the study as planned have been explained.

Conflict of interests, source of funding and authorship

IS co-owns Brickhouse Academy, an educational institution that aims at translating scientific knowledge into practice. In this respect, she trains health professionals, such as dietitians, also on the basis of the educational book that was part of the SMARTsize intervention. She has received royalties from Scriptorum Publishers for the book. All other authors declare that they have no competing interests.

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IS, WK, CB and EG conceived the study design. WH, WK, IS and FR contributed to the design of the article. WH contributed to the data collection. WH and WK contributed to the data analysis. WH, WK and FR contributed to the interpretation of the data. WH, FR and IS drafted the article. All authors read and approved the final manuscript submitted for publication.

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