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**ORIGINAL ARTICLE**

# Examining the content of weight, nutrition and physical activity advices provided by Dutch practice nurses in primary care: analysis of videotaped consultations

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**BACKGROUND/OBJECTIVE:** To examine the content of Dutch practice nurses' (PNs') advices about weight, nutrition and physical activity to overweight and obese patients.
**SUBJECTS/METHODS:** A 100 videotaped real-life PN consultations (The Netherlands, 2010/2011) with overweight or obese patients were selected. An observational checklist was developed to assess frequency and content. Personalization of advices was scored, as also the guidelines on which PNs based their advices. Content analysis was used to identify different categories of advices.
**RESULTS:** About one quarter of advices concerned weight, over two-thirds nutrition and one-third physical activity. Lose weight, eat less fat and be more physically active in general were the main categories for each type of advice. Despite high clarity of advices, lower scores were found for specificity and personalization. Very few nutrition advices were provided in combination with physical activity advices.
**CONCLUSIONS:** Weight advices often related to the patient's complaint. PNs seldom set a concrete weight goal. Although benefits of physical activity were discussed, often no practical advices were provided about how to achieve this. Integrated lifestyle advice was not common: advices about nutrition and physical activity were fragmented throughout the consultation. Obesity prevention needs more emphasis in PNs' educational programs.

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**Keywords:** General practice; obesity; lifestyle; nurses; observation

## INTRODUCTION

Overweight (that is, body mass index greater than or equal to 25) and obesity (that is, body mass index greater than or equal to 30) are on the rise in western societies. In the USA, around 33% of adults are overweight, 36% are obese and 6% are extremely obese.[1] In the Netherlands, about 40% of adults have some form of overweight, of which 10% are obese.[2] Overweight and obesity may cause many different health problems, such as hypertension, type 2 diabetes and cardiovascular disease.[3] It is commonly accepted that the combination of nutrition and physical activity is more effective than one of these alone in producing weight loss.[4] These findings are consistent with current practice guidelines on obesity.[5,6] Primary care providers are in a good position to provide nutrition and physical activity counseling to overweight patients. Several studies have shown that patients expect their general practitioners (GPs) to provide nutrition counseling.[7,8] Over the last decade, primary care practice nurses (PNs) are increasingly being used in the care of patients with chronic illnesses. They have a lot of knowledge about chronic illnesses and relatively more time for guidance than GPs, so they can have an important role in patient support in general practice.[9] Trained PNs can achieve equally good health outcomes as GPs for different kinds of diseases.[10–12] Moreover, lifestyle counseling by PNs may be an effective strategy to support weight-gain prevention and weight loss.[13]

An abundance of studies have been conducted on lifestyle counseling in general practice and its determinants. The relatively few studies that examined lifestyle counseling among PNs compared with GPs (Table 1) found that PNs self-reported higher frequencies of lifestyle counseling practices[14–17] than GPs.[15,18–29] In observational studies, lifestyle was more frequently discussed during PNs'[30,31] than GPs' visits.[30–37] Only two studies have looked at the combination of GPs' nutrition and physical activity counseling.[29,35] More specifically for obesity prevention, an up-to-date review revealed that the content of GPs' advice about nutrition and physical activity is very general, only a few communication strategies are actually used, and combined lifestyle advice occurs rarely.[38] Merely a small number of observational studies about weight counseling by GPs were identified in this review.[39–43] To our knowledge, no study about weight counseling by PNs has been undertaken before. As PNs have an important role in providing lifestyle advices, more insight is needed to examine the content of PNs' weight, nutrition and physical activity advices, their underlying communication strategies and the guidelines on which they base their advices.

The aim of this study is to examine the content of PNs' weight, nutrition and physical activity advices to overweight and obese patients, if advices are provided at all.

The following research questions are answered: (1) How often do PNs communicate about weight, nutrition and physical activity

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**Table 1.** Lifestyle counseling in general practice: position of GPs compared with PNs (that is, nutrition and/or physical activity counseling)

| *Studies among GPs* | *Studies among PNs* |
|---|---|
| *Trusted information source*<br>De Almeida *et al.*;[50] Hiddink *et al.*;[7] Van Dillen *et al.*[8] | None (one might expect PNs to be as equally trusted as GPs, as they are part of the same general practice) |
| *Task perception*<br>Hiddink *et al.*;[51] Kushner;[20] Soltesz *et al.*;[52] Hiddink *et al.*;[53] Hiddink *et al.*;[54] Lawlor *et al.*;[22] Sims *et al.*;[55] Van Dillen *et al.*;[56] Douglas *et al.*;[15] Visser *et al.*;[57] Wynn *et al.*;[28] Van Dijk *et al.*;[58] Van Dillen *et al.*[29] | Douglas *et al.*[15] |
| *Attitudes*<br>Stevenson and McKenzie;[18] Hiddink *et al.*;[51] Kushner;[20] Soltesz *et al.*;[52] Bull *et al.*;[49] Hiddink *et al.*;[53] Hiddink *et al.*;[59] Lawlor *et al.*;[22] Steptoe *et al.*;[60] Cornuz *et al.*;[61] Walsh *et al.*;[24] Abramson *et al.*;[25] Moore and Adamson;[62] Kennedy and Meeuwisse;[26] Talip *et al.*;[63] Sims *et al.*;[55] Pavlekovic and Broborovic;[64] Van Dillen *et al.*;[56] Douglas *et al.*;[15] Visser *et al.*;[57] Eley and Eley;[65] Dolor *et al.*;[66] Wynn *et al.*;[28] Van Dijk *et al.*;[58] Van Dillen *et al.*[29] | Steptoe *et al.*;[60] Burns *et al.*;[14] Douglas *et al.*;[15] Buchholz and Purath[16] |
| *Practices*<br>Stevenson and McKenzie;[18] Glanz *et al.*;[19] Kushner;[20] Hiddink *et al.*;[53] Hiddink *et al.*;[59] Kreuter *et al.*;[21] Lawlor *et al.*;[22] McAvoy *et al.*;[23] Hiddink *et al.*;[54] Podl *et al.*;[32] Walsh *et al.*;[24] Abramson *et al.*;[25] *Frank et al.*;[67] Guo *et al.*;[68] Kennedy and Meeuwisse;[26] Nicholas *et al.*;[27] Douglas *et al.*;[15] Visser *et al.*;[57] Wynn *et al.*;[28] Van Dijk *et al.*;[58] Van Dillen *et al.*[29] | Burns *et al.*;[14] Douglas *et al.*;[15] Buchholz and Purath;[16] Grimsvedt *et al.*[17] |
| *Strategies*<br>Glanz *et al.*;[19] Bull *et al.*;[49] Hiddink *et al.*;[69] Van Dillen *et al.*;[56] Van Dillen *et al.*;[70] Hung *et al.*[71] | Burns *et al.*;[14] Buchholz and Purath;[16] Grimsvedt *et al.*[17] |
| *Styles*<br>Van Dillen *et al.*;[56] Van Dillen *et al.*[70] | Kiuru *et al.*[72] |
| *Visits*<br>Podl *et al.*;[32] Beaudoin *et al.*;[33] Eaton *et al.*;[34] Anis *et al.*;[35] Flocke and Stange;[36] Poskiparta *et al.*;[30] Milder *et al.*;[48] Noordman *et al.*;[37] Noordman *et al.*[31] | Poskiparta *et al.*[30] |

Abbreviations: GPs, general practitioners; PNs, practice nurses.

in their visits with overweight and obese patients? Whose initiative is this, the patients' or the PNs'?; (2) What is the content of weight, nutrition and physical activity advices provided by PNs to overweight and obese patients?; and (3) On which guidelines do PNs base their weight, nutrition and physical activity advices in the majority of visits?

## MATERIALS AND METHODS

### Study design

For this study, we used videotapes of real-life PN–patient consultations, collected as part of a study conducted in 2010/2011 by Noordman *et al.*[31] Nineteen PNs participated and recorded ~10 routine consultations per PN in 2010 and again in 2011. All participating GPs from an earlier observational study were contacted for participation of their PNs. Ten PNs from seven practices agreed to participate. Another health-care center signed up voluntarily for participation of their 10 PNs. This resulted in 20 PNs in total, of which one stopped working during this study and is therefore left out. Consequently, 19 PNs participated. Before the recording of the consultation, both PNs and patients filled in an informed consent form. Patients were aware of the recording by an unmanned digital camera. Both PNs and patients were not aware of the fact that observations focused on communication about lifestyle behavior, although PNs were aware that their motivational interviewing skills were evaluated. They were told that the purpose of the recording was to gain insight into PN–patient communication in order to provide PNs with individual feedback. Current practice in the Netherlands does not require ethical approval, but ethical principles were adhered to. Discussing lifestyle behavior was a potential component of consultations with a mixed group of patients with type 2 diabetes, chronic obstructive pulmonary disease and hypertension. PNs' mean age was 42 years and they were all female. They had up to 10 years of practice experience. Nine PNs worked in a health-care center, nine were part of a group practice and one PN worked in a solo practice.

We aimed to select 100 consultations between PNs and overweight and obese patients from the above mentioned study. First, consultations were selected in which PNs registered overweight/obesity as the patient's complaint ($n = 29$). Next, consultations were selected in which PNs registered nutrition or physical activity/sports as the patient's complaint, or overweight/obesity, weight (loss), nutrition or physical activity/sports in the post-visit questionnaire ($n = 69$). Consultations from this last exhausting group were only included if the patient's body weight was discussed by PNs and if patients appeared indeed overweight or obese, as was the case in 47 consultations. Because patient's height was not often discussed during consultation, we could not compute body mass index for each patient and as a result we could not classify into overweight or obesity group. Patients themselves did not know they were overweight or obese, and both PNs and patients did not know that observations focused on weight counseling. The remaining 24 consultations were selected by reading the remarks about compliance with lifestyle advice or medication and referrals to other health professionals made by former observers of these PN–patient consultations. In total, 100 consultations were included in this observational study.

Of the selected group of 100 participants, 44 were male and 56 were female. Mean age was 60 years (range 22–87). Fifty-eight patients suffered from type 2 diabetes and 11 had impaired glucose intolerance, altogether 69%. Moreover, there were 27 patients with hypertension, 11 with high cholesterol, eight with cardiovascular disease, and six with asthma/chronic obstructive pulmonary disease. Their mean body weight was 95 kg at the time of the consultation, and we did not know their weight history. Mean duration of consultations was 25 min (range 8–55). Standard consultation time is 20 min. Each patient has a specific PN, which might be visited every 3 months in order to control diabetes.

### Observation instrument

An observational checklist was developed with items about overweight status, frequency, and content of weight, nutrition and physical activity advices. This checklist is available on request from the first author. The scores for all items were entered on the checklist.

*Overweight status* was measured by nine items relating to weight assessment, weight discussion and weight changes.

*Frequency of weight, nutrition and physical activity discussion* was assessed by registering if weight, nutrition or physical activity were discussed during the whole conversation. Next, the number of times PNs or patients initiated the discussion on weight, nutrition or physical activity was scored.

*The content of weight, nutrition and physical activity advices* was transcribed verbatim. Advices were defined as recommendations concerning future action. According to Whitlock *et al*.,[44] clinician advice should be clear, specific and personalized. Therefore, for each recorded advice, these criteria were evaluated but we also incorporated generality and the combination of nutrition and physical activity advices. First, clarity was registered if the message in the advice was obvious (binominal). Next, generality was ticked if the advice had relevance for others than the individual patient. Specificity was scored if the advice concerned the patient specifically (for example 'You should make a list of what you eat in one day, then we shall consider that next time'). Personalization was registered if the advice concerned a future action for behavioral change, but related this to health concerns, prior experiences, or family or social situations (for example, 'Try to cycle every day. If that does not work because of your back, try to walk 15–20 min twice a day and do this firmly.'). Finally, the combination of nutrition and physical activity advices was assessed if the advice concerned both nutrition and physical activity advices. In addition, the underlying guidelines were coded if the use of one or more of the following guidelines was discerned, namely, the Standard of Dutch College of GPs for obesity,[6] type 2 diabetes or cardiovascular risk management, multidisciplinary guideline for obesity,[45] Dutch Dietary Guidelines,[46] Dutch Norm for Healthy Physical Activity,[47] PN care modules and two tools, namely, calculator for body mass index and clinical view. Moreover, discussion of counseling-related components of the Standard of Dutch College of GPs for obesity was registered, namely, the development of an individual treatment plan (seven items) and tailored education (five items).[6] We do not know whether patients have already been in receipt of weight, nutrition or physical activity advice from their PN or GP.

After the pilot test on 10 consultations, adjustments were made in the observational checklist. Next, another 10 consultations were judged by a second observer for inter-rater reliability. Mean inter-rater reliability was substantial (Cohen's kappa = 0.62). Overweight status had almost perfect inter-rater reliability (kappa = 0.89), and the frequency of weight, nutrition and physical activity advices was average (kappa = 0.54). The inter-rater reliability on the content of weight, nutrition and physical activity advices was substantial (kappa = 0.69). With respect to the guidelines, inter-rater reliability of the guidelines used was substantial (kappa = 0.80), as also tailored education (kappa = 0.78). However, inter-rater reliability of the individual treatment plan was small (kappa = 0.11); in this case, consensus on the final data coding was reached.

### Analysis

Both simple counting and content analysis were used in this study. Frequencies of weight, nutrition and physical activity discussion and initiative takers were quantified by counting, as also the evaluation of the observed advices in terms of clarity, generality, specificity, personalization and combination of nutrition and physical activity advices. In addition, the underlying guidelines on which PNs based their advices were counted. Furthermore, all advices about weight, nutrition or physical activity were transcribed verbatim. Different categories of weight advices were identified, as also for nutrition advices and physical activity advices. Advices were illustrated by typical quotes. SPSS version 19 was used for analysis.

## RESULTS

### Frequency of weight, nutrition and physical activity discussion

In all consultations, weight was necessarily discussed. In 2% of consultations, nutrition was not discussed, and in 6% of consultations physical activity was not discussed. PNs initiated discussion of weight more often than their overweight or obese patients (118 versus 39 times).

Nutrition discussion was initiated 161 times by PNs and 78 times by overweight or obese patients. Initiation of physical activity discussion by PNs occurred 135 times, against 66 times by overweight or obese patients.

Overall, 271 advices about weight, nutrition or physical activity were given: 61 weight advices (23%), 191 nutrition advices (70%) and 82 physical activity advices (30%). Twenty-eight advices contained a combination of both nutrition and physical activity advices (10%).

In 14 consultations, PNs gave no advice at all, and there were two consultations in which PNs provided 10 advices (Figure 1). On average, three advices were provided per consultation.

### Content of weight advices

The most important category of weight advice was to lose weight, followed by the category start by establishing a feasible body weight (Table 2). In the majority of these advices, the relationship with the patient's health complaint was mentioned. Furthermore, there were a couple of advices to reduce waist size. In six weight advices, working toward a concrete weight goal was mentioned: four of those were specific about the number of pounds to lose and two contained the time period in which this weight goal had to be achieved. The advice to disbelieve tall tales about what puts on weight was not often provided. In four weight advices, awareness of overweight status was created.

With respect to the evaluation criteria, almost all weight advices were considered clear. Half were evaluated as general, and half were considered as specific or personalized.

### Content of nutrition advices

The main category of nutrition advice was to eat less fat, followed by the category to eat more fruit and vegetables (Table 3). Advices to eat less fat were formulated mainly in general terms. Regularly, links to specific foods were made, such as butter, cheese and meat. Advices to eat more fruit and vegetables were not very specific; mostly, fruit or vegetables in general were discussed. There were many advices to use less sugar. A considerable number of advices to eat more healthy food in general were given. Next, the importance of drinking enough, including water, soft drinks, milk, soup, but also of moderating alcohol intake, was often stressed. In addition, 1 in 10 nutrition advices included the possible role of the dietician. However, the possibility of consulting a dietician was always mentioned tentatively. Other categories of nutrition advice were to use less salt and to maintain a balanced diet. Eating more fish was rarely advised by PNs.

Almost all nutrition advices were evaluated as clear. A minority were rated as specific or personalized.

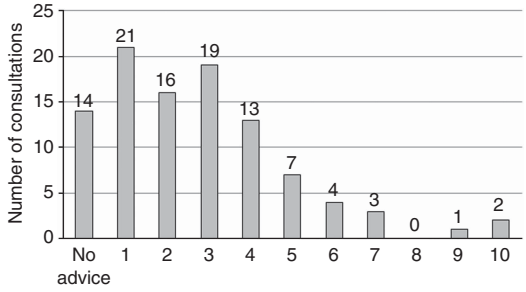


**Figure 1.** Number of weight, nutrition or physical activity advices provided by PNs in one consultation (The Netherlands, 2010/2011, consultations between 19 PNs and 100 overweight or obese patients).

**Table 2.** Most important categories of weight advices in decreasing order provided by PNs (the Netherlands, 2010/2011, 100 overweight or obese patients' visits to 19 PNs)

| *Categories* | *Examples* |
|---|---|
| Lose weight (28 times) | 'Give yourself rewards for when you lose weight, put money aside.' (visit 21)<br>'Last year we talked about the dietician, did you even think about losing weight? You do not need to be so thin, but you have diabetes, so it is a pill and losing weight.' (visit 95) |
| Start by establishing a feasible body weight (11 times) | 'Set a goal, reach your target weight.' (visit 54)<br>'I want to ask you to keep a diary and go to see a dietician, who will look at your diet and achievable weight.' (visit 61) |
| Reduce waist size (7 times) | 'Try walking two or three times a week or five or six times an hour, if you suffer from your stomach, then it is difficult.' (visit 60)<br>'You need to think what to do to lose weight, your belly is big.' (visit 81) |
| Work on a concrete weight goal (6 times) | 'Lose two kilos in one month.' (visit 89)<br>'As you lose weight, your blood sugar looks good, if you lose three pounds every three months, that's a start, and lose six inches of waist circumference.' (visit 93) |
| Disbelieve tall tales about what puts on weight (4 times) | 'From too much olive oil you become rather heavy, it is good fat, but if you put bread in it, that are too many calories, it is no problem cooking.' (visit 19)<br>'You will not become fat from eating vegetables.' (visit 29) |
| Be aware of overweight status (4 times) | 'You are significantly overweight, which is extra hard on the heart.' (visit 36)<br>'Alcohol is one of the causes of overweight, and overweight is a risk for diabetes.' (visit 37) |

Abbreviation: PNs, practice nurses.

**Table 3.** Most important categories of nutrition advices in decreasing order provided by PNs (the Netherlands, 2010/2011, 100 overweight or obese patients' visits to 19 PNs)

| *Categories* | *Examples* |
|---|---|
| Eat less fat (76 times) | 'Pay attention to the good fats, margarine on your bread, drink low-fat milk.' (visit 23)<br>'Fat meat and cake contain hard animal fat, eating chicken is better than sausage.' (visit 42) |
| Eat more fruit and vegetables (44 times) | 'That means that you should take 200 grams of vegetables.' (visit 1)<br>'Banana, fruit with carbohydrates, that gives you energy, two pieces per day, orange or orange juice.' (visit 49) |
| Use less sugar (35 times) | 'Stay alert, no sugar, but sweeteners, no sodas, but light.' (visit 100)<br>'Stop taking sugar in your tea or coffee, drink no orange juice or cola, otherwise you will get a prescription for a pill.' (visit 39) |
| Eat more healthy food in general (34 times) | 'You might be exercising more before and after Christmas, then there is not much going on, so keep moving and watch your diet.' (visit 14)<br>'It is important to lose weight by taking care of your diet, there you are doing well, but also sufficient exercise to burn.' (visit 45) |
| Drink enough (33 times) | 'Try to put a glass of water somewhere, you should drink two liters of water a day.' (visit 4)<br>'Grab one and a half liters of fluid, including soup and tea.' (visit 58) |
| Go to the dietician (25 times) | 'Let's screen you at the dietician, who looks at your age, sex, height, and occupation. When you are sitting a lot, to lose weight, fewer calories are needed than when you are moving a lot.' (visit 28)<br>'Try to exercise and lose weight with a dietician, otherwise you will get a tablet for your cholesterol.' (visit 62) |
| Use less salt (24 times) | 'Chips and cheese are high in salt, reject them and replace them with 30+ cheese, or take fruit or gingerbread.' (visit 58)<br>'Licorice, star mint tea and licorice tea contain a substance that increases blood pressure.' (visit 77) |
| Maintain a balanced diet (19 times) | 'Do not eat snacks and eat less.' (visit 40)<br>'Just like I said the last visit, eat three meals a day: breakfast, lunch, and dinner. It is unwise not to have breakfast. If you take a large lunch then, your body is offered a lot at once.' (visit 100) |
| Eat more fish (4 times) | 'Eat plenty of fish, smoked fish is beneficial, such as salmon, mackerel, and herring, there is a list.' (visit 6)<br>'Choose lean meats: ham or smoked meat, preferably fish. Find out what is good.' (visit 62) |

Abbreviation: PNs, practice nurses.

### Content of physical activity advices

The main category was to be more physically active in general (Table 4). Next, go walking was the most frequent physical activity advice. Half of these advices were formulated as specific. A number of physical activity advices mentioned cycling. Furthermore, a few advices concerned making use of opportunities for physical activity (for example, during lunch break or holiday), another few to take account of the patient's physical impairments. Only a couple of advices related to practicing some sport or participating in an exercise program. Finally, only a minority of physical activity advices made any remark on frequency (12 times), duration (12 times) or intensity (seven times) of physical activity.

All physical activity advices were rated as clear. About half of the advices were evaluated as specific or personalized.

### Guidelines

In the observed consultations, the majority of PNs based their communication on the Standards of the Dutch College of GPs, especially for type 2 diabetes (61%) and for cardiovascular risk management (29%). In 27% of the consultations, the Dutch Norm

**Table 4.** Most important categories of physical activity advices in decreasing order provided by PNs (the Netherlands, 2010/2011, 100 overweight or obese patients' visits to 19 PNs)

| *Categories* | *Examples* |
|---|---|
| Be more physically active in general (34 times) | 'Physical activity plays a role in the decrease of your glucose values, but also your weight.' (visit 45)<br>'You do not have to gain weight if you quit smoking, be more physically active, drink more for your stools, and think about your food habits.' (visit 43) |
| Go walking (31 times) | 'Walk briskly, that would be good for you, then you will burn.' (visit 57)<br>'You may also walk for ten minutes three times a day.' (visit 75) |
| Go cycling (14 times) | 'Force yourself to cycle, now in turn, it is time to take care of yourself.' (visit 2)<br>'A home trainer is a good substitute for cycling in summer.'(visit 11) |
| Make use of the opportunities for physical activity (8 times) | 'You do not have to overdo it, but a half hour of walking or cycling, preferably every day during lunch or coffee break, keep that in mind.' (visit 12)<br>'Go cycling during your vacation and move properly, you will feel comfortable.' (visit 65) |
| Practice some sport (7 times) | 'Never considered using a gym to work out, is that something for you?' (visit 55)<br>'If you start exercising, you strengthen your muscles, it also has to do with weight.' (visit 56) |
| Participate in an exercise program (6 times) | 'I want to include you in the BeweegKuur[a], I will counsel you together with GP, physiotherapist, and dietician, the program will suit you.' (visit 3)<br>'The BeweegKuur[a] might be something, the combination of nutrition and physical activity gives quicker results for weight loss.' (visit 70) |
| Keep account of physical impairments (5 times) | 'Because of pain you exercise less; this is linked to diabetes.' (visit 16)<br>'You are limited in movement, you will not become fit.' (visit 71) |

Abbreviation: PNs, practice nurses. [a]BeweegKuur is a Dutch multidisciplinary lifestyle intervention.

for Healthy Physical Activity was discerned, and the Dutch Dietary Guidelines were discussed in 23% of the consultations. In 9% of consultations, the patient's body mass index was calculated, but not based on any specific guideline for obesity.

In order to develop an individual treatment plan for obesity, in almost half of the consultations it was judged whether medicines had to be changed or stopped, in 46% of consultations personal motivation was asked for and in 29% of consultations an inventory was taken of the patients' attempts to prevent obesity and why they failed. Moreover, in 28% of consultations, patients' beliefs about a healthy weight were ascertained, the role of environmental factors was discussed in 24% of consultations and psychosocial problems were incorporated in 23% of consultations. Eight percent of consultations included asking the patient to keep a food or physical activity diary.

Tailored education about obesity was seldom provided. A quarter of consultations stressed that the risk of type 2 diabetes and cardiovascular disease was strongly heightened, partner and family were included in treatment in 17% of consultations and the importance of a lasting lifestyle adaptation in the maintenance of weight loss was mentioned in 10% of consultations. In only 5% of consultations was it mentioned that a weight loss of 5–10% has substantial health benefits, and, in another 3%, that 10% weight loss was not realistic. In 3% of consultations, distortion of energy balance was named as a cause. In 1% of consultation, it was mentioned that obesity results in a six-year life-expectancy loss.

## DISCUSSION

With respect to the frequency of discussion, this study showed rather high frequencies, compared with counseling rates in studies among GPs, which vary between 0 and 82%.[34,35,37,39–43,48] The extraordinary score for weight can be explained by the fact that the only consultations selected were those with obese/overweight patients or in which body weight was discussed. Therefore, it is inevitable that more discussion of nutrition or physical activity occurred, with the PN as main initiator.

Regarding the content of the advices, we found that nutrition advices were very diverse, just like in an earlier review.[38] In particular, advice to eat less fat was given. The importance of lowering fat intake is a substantial part of many guidelines, such as the Dutch Dietary Guidelines.[46] Patients perceived food topics reflecting dietary guidelines as highly relevant.[8] Advices about physical activity were less diverse: the majority concerned being more physically active in general and walking. Weight advices often related to the patient's complaint, such as type 2 diabetes or cardiovascular disease. A recent observational study showed that GPs refer to lifestyle mainly when it is relevant to the patient's complaints.[37] GPs tend to frame weight as a problem by treating weight as an exacerbating factor in another health problem.[39]

Evaluation of advices revealed that most advices about weight, nutrition or physical activity were not specific. A concrete weight goal was seldom set. A study among GPs showed that weight loss recommendations were made very cautiously to patients with a body mass index below 30.[42] However, we do not know much about the strategies used by PNs in prior research. Observation of the guidelines as the PNs' basis for communication confirmed that only few of them explicitly cited realistic percentages of weight loss as defined in the guidelines for obesity. Obviously, they tend to rely on the Standards of the Dutch College of GPs for a specific illness. Another plausible explanation is that discussion of weight is a sensitive topic. We also found that losing weight slowly was not often recommended. Likewise, the advice to go to the dietician was always provided tentatively. Regarding nutrition, advices to eat more fruit and vegetables were seldom specific. As regards physical activity, few advices on the frequency, duration and intensity of physical activity were provided. Although the benefits of physical activity in general were discussed, there were often no practical advices provided about how to achieve this. A survey has shown that GPs are less confident at providing specific advice on physical activity.[49] Moreover, Flocke *et al.*[40]concluded that the content of the advice rarely includes recommended components that could increase healthy behavior change. An observational study among hypertensive patients showed that in most cases the content of lifestyle advice is quite general.[48] In the majority of GP visits, minimal advice was recorded, indicating that the chart note includes general comments.[41]

Furthermore, the combination of nutrition and physical activity advice was not very common, in agreement with Van Dillen *et al.*[38] In most visits in which lifestyle advice was given, only one of four lifestyle topics was discussed.[48] It seems as if advices about nutrition and physical activity were provided at random and fragmented throughout the consultation. An integrated lifestyle advice approach was hardly discernible.

A possible limitation of this study might be the use of only one consultation per PN and overweight or obese patient.

Perhaps weight, nutrition or physical activity advices had been discussed in a prior visit. PNs might have been biased to put more effort into consultations as they knew they are being recorded. Another limitation is that the majority of our study population is diabetic. Unfortunately, we were not able to make comparisons between overweight and obese patients because we did not have height details and accordingly could not calculate the body mass index of all patients. Inter-rater reliability proved to be fairly high.

## CONCLUSION

The aim of this study was to examine the content of PNs' weight, nutrition and physical activity advices to overweight and obese patients. Weight was discussed in all consultations, more often than nutrition (98%) and physical activity (94%). PNs initiated the discussion of weight, nutrition and physical activity more often than their overweight or obese patients. In total, 271 advices about weight, nutrition or physical activity were provided. About a quarter of all advices concerned weight, which were mainly to lose weight and to start by establishing a feasible body weight. Over two-thirds of the advices involved nutrition, especially to eat less fat. A third of advices concerned physical activity advice, particularly to be more physically active in general. Most advices scored high on clarity, but rather low on specificity and personalization. Very few nutrition advices were provided in combination with advice about physical activity. The majority of PNs based their communication on the Standards of the Dutch College of GPs for a specific illness, but not for obesity.

Future research should focus more specifically on the quality of weight, nutrition and physical activity advices provided by PNs to overweight and obese patients because the quality of lifestyle counseling has hardly been studied.[38] A better understanding is needed of the way PNs advise their overweight and obese patients, such as their communication styles. With respect to practice, obesity prevention, particularly guidelines for obesity, needs more emphasis in PNs' educational programs. PNs may need more knowledge about obesity, but we are also aware of other reasons why they are not talking about this issue. Several studies about lifestyle counseling in general practice and its determinants reported on task perception, attitudes or perceived barriers (Table 1). Attention should be paid to the provision of more specific and personalized advices. As a first step, a practical tool should be developed to stress the importance of PNs providing integrated lifestyle advice, combining both nutrition and physical activity advices.

## CONFLICT OF INTEREST

The authors declare no conflict of interest.

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