For fat and thin

Prevention of overweight and obesity and the risk of eating disorders

Gezondheidsraad
Health Council of the Netherlands

To the Minister of Health, Welfare and Sport

Subject : Presentation of advisory report *For fat and thin*
Your reference : VGP/VV 2864984
Our reference : I-371/08/RW/cn/850-B
Enclosure(s) : 1
Date : August 24, 2010

Dear Minister,

On 28 July 2008, you asked the Health Council to investigate whether the prevention of overweight and obesity is a risk factor for developing eating disorders. I am pleased to hereby present the advisory report entitled For fat and thin.

In order to advise you, a Committee of Experts examined recent research into the relationship between prevention of overweight and obesity and the risk of eating disorders. The Standing Committees on Medicine and Nutrition reviewed the findings.

The committee would like to note that the effect of prevention of overweight and obesity on the risk of eating disorders can be both beneficial and adverse. The scientific literature assumes that prevention aimed at healthy diet and sufficient physical activity has no or a protective effect on developing eating disorders, while prevention programmes focusing on weight and promoting weight loss may have an adverse effect.

The committee concludes that available research is methodologically lacking. The limited conclusions available do not provide reasons to change current preventive policy, which is primarily focused on healthy diet and sufficient physical activity. However, they also do not provide convincing confirmation for it. Therefore, the committee recommends examining in studies into prevention programmes for overweight and obesity whether there are any – beneficial or adverse – effects on eating disorders.

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This advisory report provides you with the most recent scientific findings. I fully support the Committee's conclusions and recommendations.

Yours sincerely,

(signed)
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Acting President

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For fat and thin

Prevention of overweight and obesity and the risk of eating disorders

to:

the Minister of Health, Welfare and Sport

No. 2010/13E, The Hague, August 24, 2010

The Health Council of the Netherlands, established in 1902, is an independent scientific advisory body. Its remit is "to advise the government and Parliament on the current level of knowledge with respect to public health issues and health (services) research..." (Section 22, Health Act).

The Health Council receives most requests for advice from the Ministers of Health, Welfare & Sport, Housing, Spatial Planning & the Environment, Social Affairs & Employment, Agriculture, Nature & Food Quality, and Education, Culture & Science. The Council can publish advisory reports on its own initiative. It usually does this in order to ask attention for developments or trends that are thought to be relevant to government policy.

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Preferred citation:
Health Council of the Netherlands. For fat and thin. Prevention of overweight and obesity and the risk of eating disorders. The Hague: Health Council of the Netherlands, 2010; publication no. 2010/13E.

ISBN: 978-90-5549-850-5

Contents

Executive summary

Background to this advice

The Ministry of Health, Welfare and Sport has started a large number of initiatives to prevent overweight and obesity. In the context of these so-called prevention projects, the Minister of Health, Welfare and Sport has asked the Health Council of the Netherlands to advise on the question whether the increased attention paid to overweight and obesity is a risk factor for the development of eating disorders.

This includes the eating disorders anorexia nervosa, bulimia nervosa and eating disorders not otherwise specified (NOS), including binge eating disorder. The first two disorders are characterised by obsessive control of body weight via eating patterns. A person with anorexia nervosa refuses to maintain their body weight at or above the normal weight for his/her age and height. A person with bulimia nervosa will binge (eat large amounts of food in a short period of time), followed by attempts to compensate for the effects of the binges on his/her weight (for example by self-induced vomiting and/or use of laxatives). People with an eating disorder NOS exhibit some of the characteristics or a variety of the characteristics associated with anorexia nervosa, bulimia nervosa or binge eating disorder, or suffer from binge eating disorder. Binge eating disorder resembles bulimia nervosa, except that the binges are not compensated for.

In this advice, a specially appointed Committee will indicate

1 What is known about the effect of the prevention of overweight and obesity on the risk of eating disorders. This effect can be both favourable and unfavourable.
2 Whether a modification of the prevention policy is required and if so what this modification would entail.

Focus of prevention of overweight and obesity: healthy eating and sufficient physical activity

The prevention programmes for overweight (a body mass index between 25 and 30 kg/m^2) and obesity (a body mass index over 30 kg/m^2) are divided into the groups or individuals at which they are targeted.

- Universal prevention is targeted at the general population.
- Selective prevention is targeted (unsolicited) at population groups at (increased) risk of overweight or obesity, for example immigrants and people with a low level of education.
- Indicated prevention is targeted at overweight individuals.
- Care-related prevention is targeted at obese individuals.

Healthy eating and sufficient physical activity are the focal point of universal and selective prevention. Weight and weight loss used to be the focal point of indicated and care-related prevention, but the focus has shifted more and more to healthy eating and sufficient physical activity.

Hypothesis: effect of prevention of overweight and obesity on the risk of eating disorders depends on the focus of the prevention

Characteristics of a developing eating disorder are: negative body image; irrational concern about weight; fear of becoming fat; risky dieting behaviour in the form of eating very little, skipping meals, self-induced vomiting and use of laxatives and diuretics.

The literature assumes that prevention programmes that focus on weight and stimulate weight loss can intensify risky dieting behaviour, body dissatisfaction and stigmatisation and weight-related teasing. It is expected that programmes that do not focus on weight, but rather focus on healthy eating and sufficient physical activity, will be more effective in the prevention of overweight and obesity and will not influence or have a protective effect on the development of eating disorders.

Limited scientific knowledge no reason for policy change

The methodology used in the study on whether the prevention of overweight and obesity influences characteristics of a (developing) eating disorder is not very thorough. The limited conclusions do not form an indication for changing the current prevention policy, but also do not provide convincing confirmation.

Universal prevention programmes focused on healthy eating and lifestyle do not appear to have any detrimental effects on characteristics of a developing eating disorder and possibly even offer a protective effect. There is no information available on studies on the effect of selective prevention programmes. Within the indicated and care-related prevention, there are no indications that losing weight under the guidance of a professional affects the risk of eating disorders in children. Overweight and obese adults who suffer from binge eating can reduce the number of binges in the short term by caloric restriction and weight loss under professional guidance.

Both for the prevention of overweight and obesity and for the prevention of eating disorders, the emphasis is placed on healthy eating and sufficient physical activity, or reasonable amounts of physical activity in the case of eating disorders. Therefore, the literature has called for an expansion of the universal and selective prevention of overweight and obesity with the prevention of eating disorders. The additional themes for this should be: avoiding risky dieting behaviour; developing self-confidence; improving the way of coping with negative emotions and stress.

Study the effects of current prevention programmes for overweight and obesity on the risk of eating disorders

The Committee is of the opinion that there is not enough information available to make any certain statements about any favourable or unfavourable effect of the prevention of overweight and obesity on the risk of eating disorders. Therefore, the Committee recommends that research into prevention programmes for overweight and obesity should include research on the (un)favourable effects on characteristics of a (developing) eating disorder, in particular in children and adolescents. The study should preferably be included in an existing study and should focus, among other things, on risky dieting behaviour and excessive physical activity. So: study not only whether the programmes help in the prevention of overweight and obesity, but also whether they affect the development of eating disorders.

Other research recommendations

Other matters which the Committee advises to place on the research agenda, because there is insufficient information:

- Expand existing research with questions about common risk factors for overweight, obesity and eating disorders in children and adolescents.
- Study the effects of (commercial) weight loss programmes on the risk of eating disorders. Prevention programmes for overweight and obesity are not performed in isolation, but against a background of other social-cultural factors, such as commercial weight loss programmes.

Chapter 1

Introduction

1.1 Background

The Ministry of Health, Welfare and Sport has started initiatives aimed at the prevention of overweight and obesity, such as the 'Healthy Weight Covenant', the 'Hello World' intervention (an awareness-raising programme aimed at helping parents of young children to embrace a healthy lifestyle and healthy child-raising), the 'Manual for prevention of overweight in local health policy', the Netherlands Overweight Partnership and various national campaigns, such as the Nutrition Centre's 'balance day'. The 2009 Overweight Memorandum describes the large variety of activities in this field.[1]

There may be a drawback of this increased attention for preventing overweight and obesity according to the Ministry, namely that it may lead to the development of eating disorders. This includes the eating disorders *anorexia nervosa, bulimia nervosa* and eating disorders not otherwise specified (NOS), including binge eating disorders (appendix C contains the definition of eating disorders according to the Diagnostic and Statistical Manual of Mental Disorders IV (DSM-IV).[2] The first two disorders are characterised by compulsive control of body weight via eating patterns. Anorexia nervosa is an eating disorder characterised by a refusal to maintain a body weight at or above the normal weight for age and height. Bulimia nervosa is characterised by episodes of binge eating, during which large amounts of food are consumed in a short period, followed by attempts to compensate for the effects of binge eating on weight (including self-

induced vomiting and/or laxative use). Binge eating disorder is similar to bulimia nervosa, but without the compensating behaviour. People with eating disorders NOS show some symptoms of one or more eating disorders, such as anorexia nervosa, bulimia nervosa or binge eating disorder, or suffer from a binge eating disorder.[3,4]

Within the context of the initiatives focused on prevention of overweight, the Minister of Health, Welfare and Sport asked the Health Council of the Netherlands to advise on the question of whether increased attention for overweight and obesity is a risk factor for developing eating disorders (Annex A).

1.2 Question

The request for advice asks for 'an exploratory study' to answer the question of whether increased attention for overweight is a risk factor for developing an eating disorder. Areas that require investigation include gender differences in sensitivity to developing eating disorders; whether there is an increase in the number of eating disorders in teens younger than 15 years; to what degree 'popular eating disorders' such as orthorexia nervosa and anorexia athletica are related to current preventive policies on overweight and healthy diets; and whether the Ministry of Health, Welfare and Sport can modify its current prevention policy on overweight so as not to promote the development of eating disorders.

The committee (Annex B) has three comments regarding the request for advice. Firstly, it appears the requesting party is assuming that a (mono) causal link exists between preventing overweight and the risk of eating disorders. How eating disorders develop is not entirely clear. Eating disorders appear to be caused by a combination of multiple factors that may strengthen each other.[5] These factors are classified in groups: hereditary factors; biological factors; cultural and environmental factors; general psychological factors; and specific psychological factors. Independently, single factors do not appear sufficient to cause the disorder.[3]

Secondly, prevention of overweight and obesity could theoretically not only promote eating disorders, but possible actually prevent them through improved recognition of signs of incipient eating disorders, such as negative body image or irrational worries about weight.

Thirdly, it must be noted that the committee has only investigated the effects of education on healthy diets as part of the prevention of overweight and obesity.

In consultation with the Ministry of Health, Welfare and Sport, the committee has operationalised the minister's questions as follows:

- Are there signs that prevention of overweight and obesity influences the risk of eating disorders? This influence may be both beneficial and adverse.
- What changes could, if necessary, be made to preventive policy in order to prevent eating disorders?

The following sub-questions will also be addressed:

a What is the definition of overweight and obesity, what is the incidence and prevalence, what changes have been noted over the past years, and what prevention activities may be identified?

b What is the definition of eating disorders, what is the incidence and prevalence, what changes have been noted over the past years, and what prevention activities may be identified?

1.3 Methods

For this advisory report, background information on relationships between prevention of overweight and obesity and the risk of eating disorders and factors associated with the development of eating disorders were assessed systematically and categorised by level of evidence (Annex D). In addition to medical literature, this advisory report has also used 'grey' literature: guidelines, reports, advisory reports and other documents published by other advisory councils and research institutes.

The committee submitted its report to the Health Council's Standing Committees on Nutrition and Medicine for review.

1.4 Structure of the report

Chapter 2 discusses the definition, health effects, risk factors and occurrence of overweight and obesity. It also contains an overview of prevention activities. The definitions, health effects, risk factors, occurrence and prevention of eating disorders is discussed in Chapter 3. Chapter 4 examines the effects of obesity prevention on the risk of eating disorders. In Chapter 5, the committee outlines a combined preventive approach of overweight, obesity and eating disorders. It also places the possible effects of prevention programmes for overweight and obesity on the risk of eating disorders in perspective. The committee presents its conclusions and recommendations in Chapter 6. Finally, Chapter 7 answers the minister's original questions.

Chapter 2

Overweight and obesity and prevention thereof

This chapter gives definitions for overweight and obesity, describes the effects of these conditions on health, outlines risk factors, and determines how common these conditions are, in which people, and what incidence trends may be identified. The chapter concludes with a description of various forms of prevention of overweight and obesity.

2.1 Definitions of overweight and obesity

The following definitions are used for overweight and obesity in adults:

Overweight = a BMI between 25 and 30 kg/m^2.

Obesity = severe overweight. This is defined as a BMI of 30 kg/m^2 or higher.[6]

In the Netherlands, the cut-off values for overweight and obesity derived from adult values by Cole et al are used for children over the age of 2 years.[7,8]

2.2 Consequences of overweight and obesity

Obesity in particular can have severe physical, social and mental effects.

In children, obesity has serious health effects. Children with obesity have more risk factors for cardiovascular disease, abnormal glucose tolerance and type 2 diabetes mellitus. [6,8] Overweight in children often continues into adult life.[9,10]

Children with obesity are also often stigmatised. Because of this, they risk lower self-esteem during puberty, with all psychosocial problems that entails.[11,12]

In adults, overweight increases the risk of developing type II diabetes, cancer and cardiovascular disease, but has no effect on life expectancy.[6,13,14] This means people with overweight have more unhealthy years of life than people with a normal weight.

Obesity increases the risk of type II diabetes, hyperlipidaemia, hypertension, cardiovascular disease, various forms of cancer, biliary disease and locomotor conditions.[6,13,14] Additionally, obesity leads to a significant reduction in life expectancy of six to seven years, and an increase of premature death comparable to the effects of smoking.[6,14,15] Life expectancy also includes more unhealthy years.[6,14] As age increases, the influence of obesity on the risk of death decreases. From the age of 65 onwards, there is practically no correlation with life expectancy.[14,16]

Cause and effect are difficult to separate when it comes to mental and social problems. In western culture, obese individuals are often stigmatised and discriminated, making it more difficult to function within society. Stigmatisation may lead to a negative self-image and all associated psychosocial problems, such as loneliness, sadness, anxiety and depression.[6] On the other hand, people with a mental disorder such as depression appear to be at a higher risk of obesity.[17] Severely obese people may experience a lower quality of life due to mental and social problems, work disability and an increased incidence of other conditions arising from obesity.[6]

2.3 Epidemiology of overweight and obesity

2.3.1 Prevalence of overweight and obesity

At the time of writing, only the data from the 2010 Fifth National Growth Study was available, categorised by cultural background (Table 1).[18]

In the period 2002-2004, about 13 percent of children and youths had overweight; about 3 percent was obese. Relatively more girls than boys were overweight, while the number of girls and boys with obesity is comparable. The prevalence of overweight and obesity among children was highest among those aged 7 to 8 years.[19,20] All of the above data, regardless of discussion about cut-

off values for overweight and obesity, provide a good overview, as they have been measured.

In 2007, an estimated 36% of adults had overweight, and 11% was obese. Overweight is more common among men than women, while the opposite is true for obesity. It must be noted that height and weight were reported by the adults themselves.[19,21] The odds of overestimating height and underestimating weight is greater among people with obesity. This means the number of adults with obesity may be underestimated.[22,23]

Overweight and obesity are more common among population groups with lower levels of education and those with a Turkish, Moroccan, Surinamese or Antillean background.[6,21,24-26] In comparison with native Dutch people, overweight among non-western immigrants is more common among the elderly. There are no major differences between the two groups among people under the age of 39.[26] The percentage of people with overweight or obesity in the Netherlands is lower than in most other countries within the European Union.[27]

2.3.2 *The number of adults with obesity is still growing*

Between the 1980s and the beginning of the 21st century, the number of children and adults with overweight and obesity in the Netherlands has grown significantly.[18,21,28]

Over the past few years, the number of overweight adults seems to have stabilised. However, the number of adults with obesity is still growing.[29] This is also based on the previously described self-reporting data, and is consistent with data from other studies performed among Dutch population groups in which height and weight were measured, such as the Doetinchem study.

Table 1 Percentage of people with overweight and obesity in the Netherlands.

	Percentage of women	Percentage of men
Overweight	15% girls with Dutch background	13% boys with Dutch background
	32% girls with Turkish background	33% boys with Turkish background
	29% girls with Moroccan background[a18]	25% boys with Moroccan background[a18]
	30% adult women[21]	41% adult men[21]
Obesity	2% girls with Dutch background	2% boys with Dutch background
	8% girls with Turkish background	8% boys with Turkish background
	8% girls with Moroccan background [a18]	6% boys with Moroccan background[a18]
	12% adult women[21]	10% adult men[21]

[a] The difference in percentages between children with various cultural backgrounds may largely be explained by differences in socioeconomic status.[21]

2.4 Risk factors for overweight and obesity

Overweight and obesity occur when energy intake exceeds energy expenditure for years. A one-time small change in intake or expenditure, such as eating a cookie or walking 1.5 km less, has limited effects on body weight.[30] Overweight and obesity as part of a disease fall outside the scope of this advisory report.

No dominant factor influencing this energy balance – or rather, imbalance– has been identified. Genetic factors, early growth and development, and certain personality traits such as impulsiveness may have an effect on the development of overweight and obesity. Various exercise and eating habits have been associated with a risk of overweight and obesity, such as a high-fat diet, energy-dense food, diets low in dietary fibre, eating large portions, consumptions of sugared (soft) drinks, a lack of daily physical activity and too much sedentary activities such as watching television. The identification of potential risk factors in the field of nutrition and physical activity is largely based on observational studies, and the evidence is not consistent.[6,31]

The influence of environmental factors appears to be critical to the increase in the number of people with overweight and obesity. There are strong signs that sociocultural (what do others think and do), physical (what is available), economic (what does it cost) and political (what are the 'laws and rules') environmental factors can promote excessive energy intake and limit energy expenditure. This unfavourable environment is also referred to as an obesogenic environment.[6,32,33] In addition to differentiation according to sociocultural, physical, economic and political environment, the ANGELO framework (analysis grid for environments linked to obesity) also differentiates between obesity-related factors in the micro-environment (home, neighbourhood, school, work, in other words the environment where people make choices and are directly stimulated regarding eating and physical activity habits) and those in the macro environment (legislation and regulations, transportation systems, mass media, healthcare on a regional, national or international scale). Factors in the micro-environment include factors that influence eating habits and spending of free time within a family, child-raising styles and rules about eating and physical activity parents set for their children, availability of products at home, at school or in local shops, safety on the street in the neighbourhood, and social and cultural norms regarding food and physical activity in the neighbourhood, school or working environment. The macro-environment encompasses large systems and sectors that influence the micro-environment and thus can also influence the individual. Factors in the macro-environment are more distant from individual

behaviour, and contribute to the prevalence of overweight and obesity in the population. Examples of factors in the macro-environment are laws and regulations, taxes on and pricing of foodstuffs, transportation systems and mass media.[6,8,32] In addition to these categories of environmental factors, research has shown that various social-cognitive factors (for example attitudes, beliefs, experienced behavioural controls and motivation regarding eating and physical activity) influence what and how much people eat and are physically active.[34]

One of the factors most consistently associated with an elevated risk of overweight and obesity as well as unhealthy eating and physical activity habits is a low socioeconomic position. In the Netherlands, a non-Dutch background is also associated with an elevated risk.[6,21,24-26]

2.5 Prevention of overweight and obesity

2.5.1 Definitions of prevention

This advisory report has followed the interpretation of prevention given in the report Prevention ensured, published by the Health Care Insurance Board.[35] This definition differentiates between universal, selective, indicated and care-related prevention.

- Universal prevention is focused on the general population.
- Selective prevention is aimed (unrequested) at (high) risk groups within the population.
- Indicated prevention addresses individuals that do not have a diagnosed condition, but do have a combination of risk factors or symptoms.
- Care-related prevention focuses on individuals with a disease or one or more health problems, and focuses on preventing complications, worsening of the disease and handicaps.[35]

When discussing prevention programmes, programmes for adults and children should be examined separately. The effects of commercial prevention programmes fall outside the scope of this advisory report.

2.5.2 The role of the Dutch government in prevention activities

Programmes for the prevention of overweight and obesity have been in place in the Netherlands since 2003. The Overweight Memorandum of 2009[1] states that municipalities have the directing role in the prevention of overweight and obesity. The national government supports them in this task, among other things

through the handling of problem neighbourhoods and making means available for sports, physical activity and adequate healthcare. Additionally, the Centre for Healthy Living and the Netherlands Organisation for Health Research and Development (ZonMw) aid municipalities in the development and roll-out of effective prevention programmes as well as with practical issues.

In accordance with the broad prevention strategy of the Ministry of Health, Welfare and Sport, *Being healthy, staying healthy: a vision on health and prevention*, policy on overweight and obesity is elaborated along four programme lines. The Overweight Memorandum describes the large variety of activities within the programme lines, varying from national campaigns like the Nutrition Centre's 'balance day' to activities on a municipal level, such as the 'Youths at a Healthy Weight' (JOGG) programme.[1,36] In practice, preventive activities are fractured. The effects of prevention activities on weight, physical activity and energy intake are often not evaluated.[37]

The Nutrition Centre made an overview of all products, programmes and activities available in 2008 for the prevention of overweight and obesity.[38] In this so-called lifeline, distinctions are made between target groups and settings. Recommendations or approaches vary depending on age, emphasising:

- Targeted nutritional and physical activity recommendations for pregnant women.
- Breastfeeding for at least 6 months for women with newborns.
- Healthy eating and physical activity for toddlers.
- Teaching a healthy eating pattern and stimulating sports and physical activity, or promoting an active lifestyle for children and youths.
- A healthy energy balance = healthy eating + enough physical activity + a Balance Day for adults.

Another available overview is the interventions database created by the Healthy Living Centre, describing about 200 active programmes in the field of lifestyle, focused on prevention of overweight. This database explicitly indicates whether the intervention has a solid theoretical foundation and/or is effective.[39]

Finally, the National Institute for Health Promotion and Disease Prevention (NIGZ) created the Overweight toolkit specially for schools, which – like the lifeline – provides a current overview of programmes, projects and materials for addressing overweight and obesity.[40]

The above overviews reveal that there are more selective than universal programmes.*

2.5.3 *Available prevention programmes and guidelines*

The prevention programmes vary in terms of target group and nature of the preventive message (Table 2).

Universal prevention

Universal prevention programmes target the general population, and emphasise healthy diet and sufficient physical activity, in accordance with the *Guidelines for a healthy diet 2006* published by the Health Council.[42] Originally, universal prevention programmes were also focused on weight and weight loss. Because this does not appear to be effective, the focus has shifted.[43-45]

The majority of universal prevention programmes targets children in primary or secondary education. Implementation sometimes relies on teachers, youth workers or parents, and in other cases on home care employees, physiotherapists or municipal health services employees (GGD).

Table 2 Target groups for prevention programmes for overweight and obesity.

Prevention	Overweight and obesity in children	Goal	Overweight and obesity in adults	Goal
Universal	General population	Healthy diet and sufficient physical activity	General population	Healthy diet and sufficient physical activity
Selective	General population, normal weight with elevated risk	Healthy diet and sufficient physical activity	General population, normal weight with elevated risk	Healthy diet and sufficient physical activity
Indicated	Parents of children with overweight	Weight loss or preventing further weight gain	Individuals with overweight	Weight loss or preventing weight gain
Care-related	Children with overweight and their parents	Weight loss or preventing further weight gain	Individuals with obesity	Weight loss or preventing weight gain

* The Consortium on the Integral Approach to Overweight will publish an overview of national and international prevention programmes for overweight and obesity along with an assessment of effectiveness in the course of 2010.[41]

One example of a universal prevention programme for adults is the Nutrition Centre's Balance Day campaign, which is part of the multi-year 'Maak je niet dik' (watch your weight) campaign. The Balance day focuses on preventing weight gain by compensating days of excess eating with days of less eating and/or more physical activity. During a Balance Day, you eat a healthy diet according to the wheel of five, a food guide pyramid. You don't eat any extra food like candy, cookies, snacks or beer. If you have had a calorie-rich meal, you can use the extra energy by being more physically active. The Balance Day should not be an excuse to eat 'badly' and calorie-rich and not move enough on other days. The foundation for a healthy weight remains a healthy eating pattern and sufficient physical activity.

The Nutrition Centre's Balance Day is promoted via a mass media campaign (radio and television), a specially developed brochure, the Nutrition Centre's website and the digital Balance Day Newsletter.[46]

Selective prevention

Selective prevention programmes target high-risk groups within the general population, and emphasise the importance of healthy diet and sufficient physical activity. As with universal prevention programmes, selective prevention programmes were also focused on weight and weight loss. Because this does not appear to be effective, the focus has shifted.[43-45]

There are a large number of selective prevention programmes. They focus on groups with an increased risk of obesity: non-western immigrants and people with a low socioeconomic status. As is the case with universal prevention programmes, these programmes can be implemented by a variety of intermediaries.

The *Netherlands guidelines for weight management* apply to selective prevention programmes.[47] These are general guidelines for best practice and specific guidelines for adolescents, young adults and retired people. The guidelines provide a framework for the development of new prevention programmes, using the *Environmental research framework for weight gain prevention.* This framework is based on the ANGELO model, which was developed for charting the obesogenic environment.[32]

An example of a selective prevention programme is JUMP-in, developed for primary school pupils in neighbourhoods with low socioeconomic status. This programme aims to prevent overweight by promoting physical activity and enjoyment of physical activity among 4 to 12 year-old children. It pays special attention to inactive children who do not participate in sports and children with overweight and/or slow motor development. The programme consists of six parts:

1 A pupil tracking system, which monitors BMI, waist and hip measurements, sports participation and motor development.

2 School sports clubs with low threshold, daily sporting activities at or very close to school.
3 'The classroom in motion', offering all children varied options for physical activity and relaxation.
4 'This is how to MOVE!', a personal workbook for exercises to do at school and at home for children and parents in various age groups.
5 Awareness-raising activities for parents, with a general informational meeting, courses, classes and workshops to teach parents how to stimulate and support their children to adopt a healthy and active lifestyle.
6 Additional care for children with slow motor development or factors limiting physical activities such as overweight. They receive additional gym classes or motor remedial teaching. Their parents receive additional information and can, if required, be referred for specialised care.

The programme is implemented in schools and designed for permanent use. In order to embed JUMP-in into the daily routine, structural cooperation is created between city districts, primary schools, youth health care, welfare organisations, teaching support services and local sports associations.[48]

Indicated prevention

Indicated prevention emphasises the treatment of overweight in children and adults, and focuses on the individual. The importance of healthy diet and sufficient physical activity has been pushed to the foreground in this type of prevention as well.

There are a small number of indicated prevention programmes. These indicated programmes are implemented through professional support by, for example, dieticians, physiotherapists or home care employees. A course is available to parents of overweight children aged 0 to 4 years. Parents of overweight children aged 5 to 12 years may receive counselling via the youth health service (JGZ) transitional plan. There are a variety of courses and holiday camps with professional support for secondary school-aged youths with overweight.

Campaigns such as the 'Healthy weight assistant' are available to adults with overweight, emphasising healthy eating and sufficient physical activity.* Supporting materials are also available in the form of an eating table or a calorie-restricted diet.

* The 'Healthy weight assistant' focuses on adults with normal weight and adults with overweight This project is therefore classified as both universal and indicated prevention.

An example of an indicated prevention project is the transitional plan. This consists of a systematic approach to help youth health service employees with the (early) identification of children aged 2 to 18 years with overweight, and providing advice and support for parents in order to prevent further relative weight gain, thereby preventing obesity among these children. The transitional plan also provides handholds for the universal and selective prevention of overweight among children aged 0 to 18 years. The plan focuses on five elements:

1 Promoting breastfeeding.
2 More outdoor play and physical activity.
3 Regular and good breakfasts.
4 Decreasing consumption of sweetened soft drinks.
5 Less time spent in front of the TV or computer.

Children from the age of 2 with overweight or obesity are tracked down using a signalling protocol. If weight for height and age exceeds the population mean plus one times the standard deviation, BMI is determined. Internationally defined cut-off values are used to determine whether overweight or obesity is present, if necessary supplemented by a clinical view. All children with obesity and children with overweight caused by a physical disorder are referred to the GP. If overweight without a physical cause is determined, youth health services provide support. This support targets the parents of children with overweight, not the children themselves, and consists of setting up an achievable change plan with concrete, practical tips. Support consists of a maximum of four consultations. During each consultation, height, weight and waist circumference are measured.[49,50]

The transitional plan is a practice-based guideline implemented by youth health service employees.

Care-related prevention

Care-related prevention emphasises the treatment of obesity in children and adults, and focuses on the individual. As is the case for indicated prevention, this type of prevention is increasingly focused on the importance of healthy diet and sufficient physical activity.

Care-related prevention is outlined in the multidisciplinary guideline *Diagnosis and treatment of obesity in adults and children*, and is a practice-based guideline.[8,51] The guideline states that treatment of obesity consists of combined lifestyle interventions for at least one year, followed by long-term support aimed at weight maintenance or further weight loss. This requires close cooperation between doctors, dieticians, physiotherapists and psychologists. The goal is weight reduction in adults of at least 5 percent after one year, and a decrease in waist circumference of at least 10 percent. If weight loss is below 5 percent, medication can be added to the lifestyle interventions. Bariatric surgery may be considered for a BMI above 40 kg/m^2, or between 35 and 40 kg/m^2 if co-morbid condi-

tions are present. Pharmacological and surgical interventions are discouraged for children and adolescents.

2.6 Effectiveness of prevention of overweight and obesity

2.6.1 Theoretical foundations

Prevention is more likely to be successful if focused on behavioural change rather than solely on increasing knowledge. Good prevention systematically links research, theory and practice. Effecting behavioural change requires three essential components. Effective communication strategies addressing beliefs and attitudes can increase awareness and motivation. Another component focuses on setting goals and improving skills. Finally, a supporting environment needs to be created within which the desired behaviours can be performed. Each component should be based on both theory and research data.[52,53]

2.6.2 Effectiveness of prevention programmes

Systematic reviews of programmes for universal and selective prevention of overweight and obesity among children and adults conclude that some of these programmes are effective, but that it remains unclear which aspect of a prevention programme is responsible*.[54-70]

An important caveat for interpreting the results of the above systematic review articles is that few studies with solid methods have been performed. While a large number of programmes aimed at preventing overweight and obesity strive to increase awareness and motivation, few have studied the cognitive effects of the intervention. Additionally, few prevention programmes for overweight or obesity indicate whether they have a theoretical foundation or create a supportive environment.[66] An additional methodological problem is that the studies are difficult to compare, as methods vary greatly. Additionally, changes to BMI as outcome measures are contentious, as this is not a good measure for effectiveness for prevention programmes that promote physical activity. These projects may lead to a decrease in fat mass and an increase in muscle mass without affecting the BMI.[47] Physical activity can also change the distribution of fat

* The report by the Consortium on the Integral Approach to Overweight, which will be published in the course of 2010, underwrites this conclusion for adults and describes (elements of) effective prevention programmes for children in schools.[41]

throughout the body and improve insulin resistance among children with obesity without affecting body weight.[71-74]

2.7 Conclusion

Overweight increases the risk of type II diabetes, cancer and cardiovascular disease in adults, while children with overweight run a greater risk of overweight as adults. Obesity can have severe social, mental and physical consequences for adults and children. In recent years, the percentage of adults with overweight appears to have stabilised at around 36 percent. Eleven percent of all adults is obese, and the number is still growing. 14% of children with a Dutch cultural background were overweight in 2010, and 2% were obese.

Overweight and obesity develop if energy intake exceeds energy expenditure for a long period of time. No dominant factor influencing this energy balance – or rather, imbalance – has been identified. The influence of environmental factors appears to be of key importance. There are strong indications that various sociocultural, physical, economic and political environmental factors – the so-called obesogenic environment – stimulate people to consume more energy than they use.[6,33]

Since 2003, a broad variety of projects for prevention of overweight have been implemented in the Netherlands. These are primarily universal prevention projects and schools, and selective prevention projects for high-risk groups, such as pupils at schools in neighbourhoods with a low socioeconomic status. Additionally, there are a small number of indicated prevention projects for children with overweight.

For universal and selective prevention projects, the emphasis lies on healthy diet and physical activity, in accordance with the *2006 Guidelines for a healthy diet* by the Health Council. Indicated and care-related prevention focuses on preventing weight gain or promoting weight loss. Indicated prevention specifically focuses on the treatment of children and adults with overweight. Care-related prevention is centred on the multidisciplinary treatment of obesity, as described in the CBO guideline *Diagnosis and treatment of obesity in adults and children*. The latter two forms of prevention are also increasingly focusing on the importance of healthy diet and physical activity.

In practice, the offerings in the field of overweight prevention are fractured. The effects of prevention activities on weight, physical activity and energy intake are often not evaluated.

Chapter 3

Eating disorders

In this advisory report the term eating disorders is used to mean anorexia nervosa, bulimia nervosa and eating disorders NOS, including binge eating disorder. This chapter discusses the definitions of eating disorders, determines how often these conditions occur, in whom, which trends are visible, and briefly describes the health effects of these disorders. As the request for advice explicitly asks about a possible increase in the number of eating disorders among teenagers under the age of 15, the discussion of incidence and prevalence will focus on this group. The chapter concludes with a discussion of risk factors for and prevention of eating disorders.

3.1 Definitions of eating disorders

The definitions used in this advisory report were taken from the 2006 multidisciplinary guideline Eating Disorders.[3] This guideline describes eating disorders generally as disorders regarding actions, thoughts and feelings about eating and weight. Eating disorders are characterised by the preoccupation with eating and weight and abnormal weight. The *Diagnostic and Statistical Manual of Mental Disorders IV* (DSM-IV)[2] identifies three eating disorders: anorexia nervosa, bulimia nervosa and 'eating disorder not otherwise specified'. The latter category also covers binge eating disorder, for which the DSM-IV provides a research definition. Annex C lists the detailed definitions.

Anorexia nervosa = eating disorder characterised by a refusal to maintain a body weight at or above the normal weight for age and height. Patients with anorexia nervosa are usually extremely emaciated. Additionally, body weight or body shape has a disproportionately large influence on self image. Two types of anorexia nervosa are identified: the type that purges* and/or binge eats, and the limiting type that does not purge or binge eat.[3]

Bulimia nervosa = eating disorder characterised by episodes of binge eating during which very large amounts of food are consumed within a short period, followed by attempts to counter the effects of binge eating on weight. Additionally, body weight or body shape has a disproportionately large influence on self image. Two types are also identified for bulimia nervosa: the purging type and the non-purging type that generally does not display purging behaviour, but displays other inadequate compensatory behaviour for the episodes of binge eating, such as fasting or extreme physical activity.[3]

Binge eating disorder = binge eating disorder or bulimia nervosa without compensatory behaviour. Binge eating disorder is a new category in the DSM-IV. This category has only been introduced as a 'tentative diagnosis', meaning criteria for further research have been proposed with the objective of deciding whether the category will be recognised as an 'official' eating disorder at a later date. While the scientific debate continues, binge eating disorder has been accepted as a condition in clinical practice. Formally, it is classified as an eating disorder not otherwise specified.[3] This advisory report will refer to it as 'binge eating disorder'.

Eating disorder not otherwise specified (NOS) = eating disorder in which patients usually have a number of, but not all characteristics of previously listed eating disorders.[3]

Eating disorders present differently in young children. For example, they tend to eat non-edible items (pica) or regularly regurgitate food from the stomach to chew on it again without nausea (rumination disorder).[2] These eating disorders fall outside the scope of this advisory report.

3.1.1 Limitations of current definitions of eating disorders and the DSM-5

The usefulness of the above DSM-IV definition of anorexia nervosa, bulimia nervosa, eating disorders NOS and binge eating disorder for adults, adolescents and children is under discussion.[75-79] For example, the majority of eating disorder patients is currently diagnosed as eating disorders NOS.[80,81] However, this is the group that has been studied least.[82-84] Additionally, the question of whether binge eating disorder is a valid and usable diagnosis remains. There are also dis-

* Self-induced vomiting or abuse of laxatives, diuretics or enemas.

cussions about whether certain specific criteria are required for diagnosis, such as not menstruating as a criteria for anorexia nervosa, and two episodes of binge eating with compensatory behaviours per week for three months as a criteria for bulimia nervosa.[83,84]

Criticisms of current definitions for eating disorders are being evaluated in-depth during the process of drafting the DSM-5. At the time of writing, only proposals were available for new DSM-5 criteria. The final version is expected to be published in late 2010.[83-85] One of the proposals is to classify binge eating disorder as a specific disorder in the DSM-5. The proposal is to change the criteria for binge eating disorder from two to one episode of binge eating per week for three months. The criteria for the number of episodes of binge eating followed by compensatory behaviour per week will also be reduced from two to one for bulimia nervosa. Further proposals include no longer differentiating between purging and non-purging types of bulimia nervosa. For anorexia nervosa, one proposal is to remove lack of menstruation as a criterion. Persisting behaviour aimed at preventing weight gain has been proposed as an alternative to the criterion of intense fear of gaining weight or getting fat. Additionally, each eating disorder will be given a continuous scale for severity of the condition. Finally, the DSM-5 is considering describing specific problems requiring clinical attention for eating disorders NOS, such as repeat purging without overeating and nocturnal eating syndrome. One of the comments on the proposed DSM-5 definitions for eating disorders, is that definitions appear to be more applicable to women than men.[85]

3.1.2 Delimitation

The request for advice lists anorexia athletica and orthorexia as examples of eating disorders (Annex A). There is also a debate in the scientific community about whether obesity is an eating disorder.[86] Additionally, various forms of eating and dieting behaviour have been described. This advisory report will not treat anorexia athletica, orthorexia, obesity and various forms of eating and dieting behaviour as eating disorders for a number of reasons.

Anorexia athletica is not an official eating disorder*. Excess physical activity can, particularly among boys, be a strategy to lose weight while still exhibiting boyish behaviour. It is both a characteristic of eating disorders and a factor asso-

* The advisory report describes anorexia athletica as follows: Extreme amounts of sports or physical activity are considered a characteristic of eating disorders, and are also a specific risk factor for developing an eating disorder. In people with normal weight, extreme exercise may lead to weight loss while they consume relatively normal amounts of food. Some individuals continue engaging in sports for longer and more fanatically in order to increase performance. Particularly for men, this may be a strategy to lose weight without having to diet.

ciated with the development of eating disorders.[3] In writing the DSM-5, there has been debate about whether excess physical activity should be included in the definition of eating disorders.[85] This is different from a specific form of body dysmorphic disorder, bigorexia nervosa or muscle dysmorphia, in which a patient is so obsessively concerned with a muscular appearance and body building that his or her social life, education or work is affected negatively.[2]

Orthorexia is extreme, compulsive healthy eating, and is considered a risk factor for the development of an eating disorder, but is not an official eating disorder.[3] In orthorexia, growing numbers of food items are taken off the menu, particularly those that contain a relatively large number of calories, fat or sugars. Children and adults who grow increasingly obsessed by healthy foods run the risk of going too far and developing an eating disorder, particularly when combined with psychological risk factors. The reasons orthorexia is not considered an eating disorder within the scope of this advisory report is that orthorexia is not necessarily related to weight or weight prevention, but may also be part of certain beliefs about healthy diet and health, or be related to awareness-raising about healthy diet in general or the prevention of cancer.

This advisory report will not classify obesity as an eating disorder, as there are insufficient signs that obesity can be classified as a psychopathological disorder. Whether or not obesity is a mental disorder remains a hotly debated topic in the field.[87,88] Thinking about obesity as a psychopathological condition may well change in the future. Despite this, it is clear that mental health care (GGZ) should be involved in the treatment of obesity.[88]

Obesity-related eating behaviour can be categorised as follows:

- Emotional eating: Eating due to negative emotions, which may be vague, such as boredom, or specific, such as fear.
- External eating: Eating in response to strong food stimuli such as smell or visibility of food.
- Restrained eating: Limiting food intake in order to maintain or lose weight.[89]

These forms of eating behaviour are not considered psychopathological in the DSM-IV, and this will not change in the DSM-5. Various forms of eating behaviour may, however, be associated with eating disorders. Emotional eating behaviour may be associated with binge eating.[90,91] Children and adolescents with overweight more commonly exhibit external and/or emotional eating behaviour, and score higher on restrained eating behaviour than children with a normal weight.[92]

Restrained eating behaviour is diverse, and there is no consensus on how to categorise its various forms. Not all dieting behaviour causes eating disorders or

corresponds with an eating disorder in terms of eating behaviour. Limited caloric restriction* reduces the tendency to overeat.[93] Cohort studies have shown that successful dieting behaviour that prevents girls from gaining or losing weight can reduce bulimic symptoms.[94,95]

Eating very little, skipping meals, self-induced vomiting and use of laxatives and/or diuretics is risky.[3,96] Intensive and risky dieting behaviour, from the use of cigarettes or diet pills to reduce appetite to self-induced vomiting or the use of laxatives and diuretics, is more common among teens and adolescents with overweight or obesity than among adolescents with normal weight.[97] Additionally, intensive and risky dieting behaviour is associated with an increased risk of developing binge eating and weight gain.[98]

The question remains: what is cause, and what is effect? As Hill et al state: It may be that 'being fat makes you more likely to diet'.[99] It may be that people who are predisposed to overweight and overeating diet more often in a more intensive or risky manner. This does not always lead to weight loss, and may even lead to weight gain.

Within this context, Goldsmith and colleagues call for early identification of young people with overweight and intensive or risky dieting behaviour or binge eating, in order to prevent them from becoming obese.[97]

3.2 Consequences of eating disorders

Eating disorders may, over time, have many often severe social, mental and physical effects.

Eating disorders seriously affect the social lives of patients. They often lead a limited, even handicapped life, because they are no longer physically capable of working, studying or going to school, isolating them socially.

Associated psychological complaints include depression, anxiety, concentration and memory disorders and obsessive thinking.

In anorexia nervosa, physical symptoms are caused by underweight, malnutrition, fasting and overactivity. Some of these symptoms may be life-threatening: cardiac arrhythmias, congestive heart failure, hypoglycaemia. In young children, anorexia nervosa may lead to slowed growth and sexual maturation. Among eating disorder patients who purge, physical complaints may (also) be caused by vomiting and laxative and/or diuretic abuse, which can lead to cardiac arrhythmias and renal dysfunction. Physical effects of an irregular diet and/or

* A reduced calorie diet with a caloric value which is 600 kcal per day lower than normal for the person in question.[8]

binge eating are menstrual disorders, nausea and abdominal pain, diarrhoea and obesity.[3]

Anorexia nervosa is one of the mental disorders with the highest mortality.[3,100] Based on data from international research, an estimated 15 to 30 patients with anorexia nervosa die each year in the Netherlands. This cannot be confirmed using national cause of death statistics, possibly because cause of death in eating disorders is classified under other codes, such as complications of weight loss or suicide.[101,102]

Mortality among patients with bulimia nervosa or eating disorders NOS may be comparable to mortality for anorexia nervosa[103], but insufficient data is available to draw any conclusions.[100]

3.3 Epidemiology of eating disorders

3.3.1 Research into eating disorders

The figures on the prevalence of eating disorders underestimate the actual number of people with an eating disorder (table 3). Studies into eating disorders are hampered by low prevalence among the general population, and the tendency of people with eating disorders to hide symptoms and avoid professional help. An additional difficulty in patients with bulimia nervosa or binge eating disorder is that, unlike anorexia nervosa patients, they do not always display physical traits of the disease.[3,4]

The best method for determining the prevalence of eating disorders is a two-phase study. This method uses a questionnaire to screen a large group of people for potential eating disorders. This yields an at risk group. Subsequently, both the at risk group and a randomly selected group without elevated risk are interviewed. This allows actual cases to be identified. This approach is also limited due to low participation, low specificity and sensitivity of both questionnaire and interview, the often limited extent of the groups interviewed, particularly the group without elevated risk.[4]

Most international studies looking at the incidence of eating disorders are based on registries of psychiatric conditions or hospital medical charts. This underestimates the actual numbers among the general population, as not all cases are admitted to hospitals or come into contact with care institutions.[4]

There are no good data available on the incidence of eating disorders among non-western immigrants in the Netherlands.[3] This does not mean eating disorders do not occur in this group in the Netherlands: various studies have shown that girls and women from non-western backgrounds may also develop eating

disorders after migration to western countries[3,5,104-106], although the effect appears to be dependent on the country of origin.[107] Initially, anorexia nervos was rarely to never diagnosed among black women from, for example, Curacao and America.[108,109] The growing influence of western lifestyles among these women will likely lead to an increase in the number of eating disorders.[110,111]

Finally, the introduction of updated and new definitions of eating disorders in the DSM-5 will also lead to an increase in the incidence of some eating disorders.

3.3.2 *Occurrence of anorexia nervosa and bulimia nervosa*

The eating disorders anorexia nervosa and bulimia nervosa occur primarily among 15 to 24 year-old women (table 3).[3,4] In clinical practice, a small percentage of patients with anorexia nervosa or bulimia nervosa are men,[4] compared to about 5 percent of patients in general practice.[112] According to two-phase studies conducted among European and American adults, lifetime prevalence of anorexia nervosa is 0.9 percent among women, and varies between 0 and 0.3 percent among men. In these studies, lifetime prevalence of bulimia nervosa varied between 0.9 and 1.5 percent among women and 0.1 and 1.5 percent among men.[113,114] A Finnish two-phase study among girls and young women found significantly higher lifetime prevalence figures for anorexia nervosa (2.2 percent) and bulimia nervosa (2.3 percent).[116,117] Lifetime prevalence for anorexia nervosa among young men was comparable to data from European and American research*.[118] One possible explanation for the higher percentage among Finnish girls and young women is that the number of anorexia nervosa patients in younger birth cohorts has risen.[116] Another explanation was that older European and American participants do not remember their symptoms as clearly.[113,114]

Occurrence among children under the age of 15 years

Little research has been done into the incidence and prevalence of anorexia nervosa and bulimia in groups younger than 15 years of age.

Anorexia nervosa occurs sporadically in children, and can have severe negative – sometimes irreversible – effects on physical development.[119,120] Bulimia nervosa is extremely rare among young children who are not yet sexually mature. [121]

* The lifetime prevalence of bulimia nervosa among Finnish men was not reported.

Table 3 Incidence and prevalence of eating disorders in industrialised countries.[a]

	Incidence per year among women in general practice	Prevalence among women	Prevalence among men
Anorexia nervosa	0.015 %[112]	0.4 % of women aged 15-29 years [4]	Not reported[b]
Bulimia nervosa	0.012 %[112]	1.5 % of women aged 15-29 years [4]	Not reported
Binge eating disorder		1 to 2 %[c80]	1 to 2 %[80]
Eating disorders NOS [d]		2 % of women aged 12-23 years [81]	Not reported

a The introduction of updated and new definitions of eating disorders in the DSM-5 will also lead to an increase in the incidence of some eating disorders.

b A small percentage of anorexia nervosa patients in treatment centres and about 5 percent of anorexia nervosa patients in general practice is male.[4,112]

c This is a single phase study. Two-phase studies have found two to six times higher lifetime prevalence figures for binge eating disorders for women compared to men.[113,114]

d About 60% of all eating disorders.[75,76,115]

In the Netherlands, one study conducted in a general practice population over a ten year period at the end of the 20th century identified a single child under the age of 10 with anorexia nervosa, and one more with bulimia nervosa. The study examined 1 percent of the Dutch population.[112]

A more recent prospective study found the incidence of early onset eating disorders among Australian children aged 5 through 13 years to be 0.001 percent. The median age for developing an eating disorder was 12 years. In this study, eating disorders are defined as avoidance of food combined with weight loss or a lack of weight gain during growth without a clear biological cause. According to the DSM-IV criteria for eating disorders, 38 percent of the children with an eating disorder had anorexia nervosa. These figures are based on a registration of eating disorders using the *Australian Paediatric Surveillance Unit*, and not on a two-phase study, which may lead to underestimation of the actual problem. The incidence also varies between regions in Australia, which may indicate underreporting in some regions. The region with the highest incidence reported a figure of 0.003 percent. Finally, one quarter of patients was male.[120] Data from other countries also shows a higher percentage of boys with anorexia nervosa among young children compared with adolescents.[122,123 120]

Possible shift in incidence to younger age groups

In the Netherlands, the number of patients with anorexia nervosa has remained stable since 1980. This trend is also visible in other western countries.[4,114,124] There are also signs that the number of patients with bulimia nervosa is in slight decline since the 1980s,[112] which also appears to be the case in some other European countries.[4,124] In the USA, the risk of bulimia among young women appears

to have remained stable between 1990 and 2004.[125] These figures are based on registries and not two-phase studies. Therefore, the data and any trends should be assessed with the necessary care.

The incidence of anorexia nervosa in general practice appears to have shifted towards younger girls and women from the age of 15 years between the 1980s and 1990s. The incidence of anorexia nervosa among girls between the ages of 15 and 19 years almost doubled between the 1980s and 1990s (from 0.06 to 0.11 percent per year), while the incidence among women between the ages of 20 and 34 years dropped. For bulimia nervosa, the high-risk group shifted from 26 to 29 year-olds to 15 to 24 year-olds in the same period.[112]

Based on these data, it cannot be concluded that anorexia nervosa or bulimia nervosa are occurring at younger ages. This is because early diagnosis of anorexia nervosa and bulimia nervosa improved during this period, family doctors may have become better at recognising symptoms, and awareness of eating disorders has increased in the general public under the influence of the media.[112] However, it cannot be ruled out that there has been an age shift. For example, specialist treatment centres treat anorexia nervosa patients under the age of 12 years with increasing frequency.[126] At the time of writing, no precise data were available.

The data described above were largely collected in the 1990s. More recent data from the Continuous Morbidity Registration Polling Stations show no significant changes in eating disorder incidence between 1995 and 2007. As published data contain double counts and combination of new and existing cases, no firm conclusions may be drawn based on this information.[127] The incidence and prevalence data for anorexia nervosa and bulimia nervosa from the second national study of diseases and interventions in general practice from 1987 and 2000 through 2002 are difficult to compare, as both eating disorders are combined in the reports*.[128]

The committee is not aware of any studies in other western nations in which a shift of the incidence of anorexia nervosa from older to younger age groups has been reported. There does appear to be an increase in the number of young children with anorexia nervosa registered for treatment at specialist centres in the USA since the early 1960s.[129] This may also be explained by increased awareness of the condition and improved accessibility of care.[121]

* In 2008, a new *Netherlands Mental Health Survey and Incidence Study* (NEMESIS) was performed, but data on any changes in prevalence in anorexia nervosa and bulimia nervosa were not available at the time of writing.

3.3.3 Little is known about the occurrence of eating disorders NOS

Eating disorders NOS is, by definition, a remainder category. It encompasses a heterogenic group of all patients that do not meet all criteria for anorexia nervosa or bulimia nervosa, or vacillate between the two conditions. Binge eating disorder is also classified as an eating disorders NOS.[3] Although it is a remainder category, international studies have shown that eating disorders NOS are the largest category among both children and adults (Table 3).[75,76,115] About 60 percent of outpatients with an eating disorder have an eating disorders NOS.[115] Eating disorder NOS is also the largest category within the eating disorders among the general population.[130]

Little is known about the incidence of eating disorders NOS in the Dutch population. Further description is therefore based on limited data from international studies.

A Portuguese two-phase study found that eating disorders NOS occurred in 2 percent of 12 to 23 year-old women.[81] Other epidemiological studies among adolescents showed incidences of eating disorders NOS varying between 0.8 to 14 percent. This variation is due not only to differences between examined groups of adolescents, but also due to different methods used to diagnose eating disorders NOS and different diagnostic criteria used.[82]

Binge eating disorder is classified under eating disorders NOS. A two-phase study among Europeans from the age of 18 years, including Dutch participants, found a lifetime prevalence for binge eating disorder of 1.9 percent for women and 0.3 percent for men.[113] In the United States, the lifetime prevalence of binge eating disorder is 3.5 percent for women aged 18 and older, and 2.0 percent for men aged 18 and older.[114] The committee expects that lifetime prevalence would be higher in both studies if younger age groups were also examined. Other studies were performed with a one-time interview, not a two-phase method. Therefore, the data below and any trends should be assessed with the necessary care. The prevalence of binge eating disorder was 1 percent in a 1995 study among the Australian population aged 15 years and older, and was equally common among men and women.[80] 3 percent of teenage girls and 1 percent of teenage boys in the United States suffer from binge eating disorder.[131]

The abovementioned studies found a correlation between the risk of binge eating and body weight or BMI.[80,114,131] About 30 percent of people with obesity who seek treatment suffer from binge eating disorder. Among people with obesity who do not seek treatment, this figure is around 5 percent. Binge eating disor-

ders appear to be more common in people with obesity who seek treatment than among those who do not.[132]

Possible rise in the prevalence of binge eating

Studies suggest that the prevalence of binge eating may be increasing. For example, a one-phase Australian study found a prevalence of 3 percent in 1995, and 7 percent in 2005. This increase in prevalence of binge eating remained significant even after correction for changes in body weight.[133]

Incidence and prevalence of binge eating among children under the age of 15 years

Binge eating occurs in 2 percent of 5 and 6 year-old German children[134] and 9 percent of 8 to 13 year-old Australian children.[135] As is the case for adults, overweight is associated with an increased risk of binge eating.[134,135]

Of children and adolescents who seek treatment for overweight, between 15 and 18 percent have experienced loss of control over food, independently of the amount of food they consume. [119,136,137]

3.4 Trends in occurrence of eating disorders and overweight and obesity

The above paragraphs indicate that the increase in overweight and obesity since the 1980s has been accompanied by a slight drop in the number of bulimia nervosa cases.[112] Whether it has also been associated with a significant change in the number of anorexia nervosa cases is unclear. The incidence of anorexia nervosa among girls between the ages of 15 and 19 years increased between the late 1980s and the 1990s, but as previously indicated, this may be due to improved registration and early diagnosis.[112] Whether the increase in overweight also correlates with the incidence of binge eating disorder or eating disorders NOS is unclear: Dutch data are lacking on this subject. Australian data do show an increase in the number of people with binge eating, but the data quality is limited.[133]

The government has been implementing an active prevention policy against overweight since 2003. Whether introduction of government policy in 2003 was accompanied by a change in the incidence of eating disorders could not be determined at the time of writing, as data on this subject was lacking.

3.5 Risk factors for eating disorders

3.5.1 *Factors associated with the development of or having eating disorders*

How eating disorders develop is not known. Most insights into the role of potential risk factors for developing eating disorders come from cross-sectional case-control studies and a limited number of prospective cohort studies.[3] Eating disorders appear to be caused by a combination of multiple factors that may reinforce each other.[5] These factors may be categorised as follows: specific psychological factors, general psychological factors, cultural and environmental factors, hereditary factors, and biological factors (Table 4). Protective factors for eating disorders are often opposite risk factors. An example of a protective factor is participating in sports that do not require you to be light or beautiful.[138]

It is unclear whether each factor has a causative and/or maintaining effect on the risk of eating disorders.[3,139]

Table 4 Factors associated with the development of eating disorders in relation to prevention of overweight and obesity.[3]

Factors associated with the development of eating disorders
Specific psychological factors
Negative body image
Irrational worries about weight
Risky dieting behaviour
Fear of getting fat
General psychological risk factors
Lack of self-confidence
Negative self-image and feeling of ineffectiveness
Focus on performance and perfectionism
Obsessive personality traits and a strong need for control
Anxiety
Impulsiveness
Sociocultural factors
Taking part in sports that require low weight or beauty

3.5.2 *Psychological risk factors*

The following specific psychological factors are considered to be characteristic signs of incipient eating disorders: negative body image; irrational worries about weight; risky dieting behaviour in the form of eating extremely little, skipping meals, self-induced vomiting and use of laxatives and diuretics; and the fear of

getting fat.[3] With regard to the correlation between dieting and eating disorders, dieting focused on weight loss is seen as a necessary but insufficient prerequisite for the development of anorexia nervosa or bulimia nervosa.[140]

General psychological factors are not only associated with the development of eating disorders, but also with the development of other mental disorders. This includes a lack of self-confidence, negative self-image and feeling of ineffectiveness, a focus on performance and perfectionism, obsessive personality traits and a strong need for control, and anxiety. Impulsiveness is specifically linked to the development of eating disorders of the bulimic or purging types.

3.5.3 *Cultural and environmental factors*

Cultural and environmental factors associated with the development of eating disorders are the thinness ideal for girls and women with low self-confidence and a negative body image, and the type of sports taken part in. Women competing in professional sports in which low weight or beauty are important run a higher risk of developing eating disorders than women who do not play sports, or play other sports.[3] The media is also mentioned as a risk factor associated with the development of eating disorders, although there is no evidence for this. Given the broad public attention for the potential role of the thinness ideal and the media in the development of eating disorder, the issue is examined in greater detail below.

Thinness ideal

The thinness ideal is associated with developing eating disorders in girls and women with low self-confidence and a negative body image in particular.[3] It appears that this vulnerability is partly genetic.[141,142] Only a small percentage of all people who diet develop an eating disorder. People with low self-confidence who are dissatisfied with their body can internalise this thinness ideal. When these individuals lose weight, they may gain self-confidence and go overboard with the weight loss.[3,111] Girls and women with eating disorders appear to pay greater attention to this thinness ideal after the eating disorder has begun.[143]

One argument that is made for the thinness ideal as a risk factor for developing eating disorders is that the number of patients with eating disorders increases as countries and population groups adopt a more western lifestyle, and thin is valued over fuller figured as an ideal.[3,5,111] Countries in which the physical ideal shifts from full figured to thin often undergo a concurrent shift from traditional lifestyles in rural areas to modern lifestyles in urban areas, often including a dif-

ferent position of women in society and more liberal sexual mores. These changes may also influence the risk of eating disorders.[3,111]

Influence of the media

There is no consensus on the specific influence the media has on the development of eating disorders. This encompasses not only the use of extremely thin models, but also TV shows and articles emphasising weight and looks, such as weight loss shows, extreme makeover programmes and advertising weight loss products. These programmes may have unintended negative effects, such as increasing dissatisfaction with the body and risky dieting behaviour.[144-147]

The influence of the media is difficult to study. Every social problem – such as prejudice, bullying or violence – is embedded in a broad array of social influences, and the role of the media in this process cannot be viewed in isolation. Research into the harmful influence of the media shows no direct causal link between exposure to media and violence or other social problems, but that certain media images and content can, under certain circumstances, be harmful to certain individuals.[148,149]

There are internet sites that glorify eating disorders such as anorexia nervosa. These so-called pro-ana sites, of which there are over 250,000*, may play a role in the progression of eating disorders by stimulating risky dieting behaviour, thereby strengthening identification with a movement promoting anorexia nervosa as an acceptable lifestyle.[150,151] The committee is not aware of any studies into the effects of social networks such as Hyves, Facebook and other 'new media' outlets on the course of eating disorders.

Media literacy training is part of some programmes for preventing eating disorders. Media literacy training teaches pupils to critically examine advertising messages, and reduces internalisation of the thinness ideal and improves their personal body image. However, there is insufficient evidence to determine whether this training also improves other factors associated with developing eating disorders. Studies have also not been running long enough to determine whether media literacy training can contribute to preventing eating disorders.[153]

* A google search for the terms pro-anorexia, pro-ana sites, thinspiration and anorexicnation results in 257,000, 18,600, 14,200 and 577 hits, respectively.[150]

3.5.4 *Model-based research into the development of eating disorders*

Various researchers have studied the development of eating disorders using mathematical models. These models compare various ways in which eating disorders, particularly bulimia nervosa, may develop. Overall, these models show that low self-esteem may be an important risk factor for the development of eating disorders, as well as dissatisfaction with the body, weight-related teasing from family or friends, striving to get thinner, a higher BMI and the influence of the media*.[154]

An example of a model for the development of binge eating and bulimia nervosa is the dual-pathway model. This model states that the experienced pressure to be thin, the internalisation of the thinness ideal and a high BMI increase dissatisfaction with the body. In turn, this negative body image increases the risk of binge eating and bulimia nervosa in two ways: experiencing negative feelings and emotions such as depression and anxiety, and restrained eating, defined as limiting food intake in order to maintain or decrease body weight.[89,93,155] However, there is no direct correlation between an elevated BMI and the risk of binge eating or bulimia nervosa.[3] Additional prospective studies have only confirmed the development of these eating disorders via negative feelings and emotions. The effect of negative feelings and emotions on the risk of binge eating and bulimia nervosa appears to be due to not sufficiently listening to or sensing feelings of satiation and via emotional eating. The development of binge eating and bulimia nervosa via restrained eating is not confirmed by additional studies. This is likely caused in part by the fact that restrained eating encompasses a broad variety of dieting behaviours.[156-160]

3.6 Prevention of eating disorders

3.6.1 *Current state of affairs*

The prevention of eating disorders receives far less attention than that of overweight. In 2006, 28 percent of the mental health prevention teams addressed the prevention of eating disorders in children, and 19 percent in adults.[161] There is no national coverage for preventive activities. The offerings in the field are also fractured.[162] The mental health prevention field is currently exploring how best

* The author does not specify this influence.

to address the psychosocial and psychological aspects of (un)healthy eating behaviour.[162]

The universal and selective prevention activities consist of information for the public via websites, guest lectures at school, expertise promotion in intermediary target groups and information and advice via e-mail. Indicated and care-related preventive activities encompass self-help groups, eating disorder courses, informational gatherings for parents and other involved parties, support groups for parents and aftercare for self-help groups.[163]

Recent prevention programmes focus on addressing both general and specific psychological factors associated with developing eating disorders (Table 4). The most recent prevention programmes target positive goals such as gaining self-confidence and a positive body image, and enjoying appropriate eating and physical activity.[164] Selective and indicated prevention provides more information about how help may be sought.[165]

The care-related prevention of eating disorders is described in the Multidisciplinary Eating Disorders guideline.[3] This emphasises an integrated approach to treatment that not only focuses on eating behaviour, body weight and body image, but also on general psychological problems including insecurity, perfectionism and traumas, as well as on difficulties in social functioning.

3.6.2 *Effectiveness: theory*

In general, prevention is more likely to be successful if focused on behavioural change rather than solely on increasing knowledge, and if research, theory and practice are linked.[52,166] Current prevention programmes for eating disorders are supported by research into risk factors and effects of previous prevention programmes. It remains unclear whether setting up prevention programmes for eating disorders also addresses the three essential components for achieving behavioural change: increasing awareness and motivation; setting goals and improving skills; and creating a supportive environment. Whether research, theory and implementation are linked when setting up programmes is also unclear.

3.6.3 *Effectiveness: implementation*

Whether programmes for the prevention of eating disorders are effective has not been studied.[3] Research has been done into the effects of these programmes on factors associated with the development of eating disorders.

A Cochrane review from 2002 concluded that no firm conclusions may be drawn regarding the effectiveness of universal or selective eating disorder pre-

vention programmes for children and adolescents. The only significant result of the meta analysis showed a small improvement with regard to internalisation of social ideals about appearance using media literacy training. Universal and indicated prevention programmes as well as programmes focused on improving self-worth had no clear effects.*

A more recent review article also found no firm conclusions could be drawn regarding the effects of internet-based eating disorder prevention programmes targeting adolescents and students. The number and scope of the studies is too limited for this.[167]

Another recent review article examining the effect of prevention programmes focused on worries about weight among primary school pupils shows improved knowledge about nutrition among children. There was also limited evidence that the programmes increase self-worth. There were no signs that the programmes improved worries about the body or problematic eating behaviours.[168]

A critical note regarding the above review articles is that prevention programmes are often offered to an entire classroom or an unselected group, while most pupils do not lack self-esteem or have a negative body image. This makes it difficult to find an effect in these outcome measures.

Furthermore, the nature of prevention programmes for eating disorders in the Netherlands has changed over time. Originally, prevention in the Netherlands was focused on early identification of eating disorders. This only achieved limited success, because there is no valid and sensitive method for tracking them down. Additionally, people who were tracked down were generally not motivated to accept their eating disorder or seek help for it. The prevention that followed also achieved limited success. It consisted of universal prevention classes about eating disorders at schools. These lessons improved knowledge about risk factors, characteristics and consequences of eating disorders, and to a lesser degree affected attitudes regarding thinness and dieting, but had hardly any effect on behaviour.[164] Additionally, negative effects of eating disorder lessons have been reported. Among other things, this relates to classes in which eating disorders are glamorised or normalised.[3,164] There are signs that awareness raising about anorexia nervosa that use examples of very thin women strengthen risky dieting behaviours in pupils already engaging in them or those with anorexia nervosa.[153] Current prevention activities are mostly focused on individuals who are at (higher) risk of developing an eating disorder. The expertise of intermediate

* The Cochrane review is currently under revision, during which the impact of clustered randomised studies is being determined.

target groups such as GPs and paediatricians, teachers, sports instructors and informal carers is also promoted.[163]

3.6.4 Characteristics of effective programmes

A number of review articles with less stringent inclusion criteria than the meta-analyses mentioned above examined characteristics of prevention programmes associated with greater effectiveness.[169-171] The best results appear to be obtained through indicated (rather than universal) interactive prevention programmes targeting a high-risk group of girls over the age of 15 years, who are approached by professionals and receive multiple sessions rather than a single session. Programmes about body acceptance, in which differences between observations or ideas and an individual's beliefs are highlighted (dissonance induction), without lessons about eating disorders, using validated research tools and a short follow-up yielded the best results.[169-171] A fourth review of studies into the prevention of eating disorders among students identified a prevention programme focused on improving media literacy, particularly with regard to the thinness ideal, and dissonance induction, in which older students teach younger students in order to improve the self-confidence of both, as successful elements warranting further study. Computers and the internet appear to be useful tools for prevention activities.[152]

Despite the fact that indicated prevention programmes appear to be more effective than universal prevention programmes, Noordenbos and Vandereycken also call for universal prevention.[153] By emphasising positive goals, such as healthy diet, appropriate physical activity, critical examination of the thinness ideal and promoting a positive body and self-image, extreme dieting may be prevented among young people with low self-esteem and a negative body image. As a second step, pupils with a negative body image and risky dieting behaviour, such as eating extremely little, skipping meals, self-induced vomiting and use of laxatives and diuretics, could be offered an indicated prevention programme aimed at changing knowledge about nutrition, physical activity, self-worth, body image and risky dieting behaviour. It is also very important to address improving regulation of emotions and dealing with negative emotions and stress. The effectiveness of the above two-stage preventive strategy has not yet been examined in detail.[153,164]

Finally, the question of whether prevention of eating disorders may promote overweight or obesity has not been examined.

3.7 Conclusion

This advisory report identifies three categories of eating disorders: anorexia nervosa, bulimia nervosa and eating disorders NOS, which includes binge eating disorder. Eating disorders can have severe social, mental and physical effects.

Anorexia nervosa and bulimia nervosa occur primarily among 15 to 24 year-old women: the incidence of anorexia nervosa is 0.4 percent per year, and that of bulimia nervosa is 1.5 percent per year. In clinical practice, only a few percent of patients are men. In general practice, this figure lies around 5 percent. Little is known about the incidence and prevalence of anorexia nervosa and bulimia in groups younger than 15 years of age. Anorexia nervosa is seen sporadically in children, while bulimia nervosa is extremely rare in young children who are not yet sexually mature. The incidence of anorexia nervosa appears to have shifted towards the younger age group of 15 to 19 year-olds, and that of bulimia nervosa towards the younger age group of 15 to 24 year-olds between the late 1980s and the 1990s. This shift may be explained by improved registration and early diagnosis.

The overall percentage of people with anorexia nervosa has remained stable since the 1980s, and the percentage of people with bulimia nervosa may have decreased slightly. No data is available to confirm whether the incidence of eating disorders has changed since the government implemented an active policy for the prevention of overweight and obesity in 2003.

There is also no information available on the incidence of eating disorders NOS in the Netherlands. A limited number of international studies have examined this disorder, despite the fact that 60% of patients with an eating disorder are classified as having an eating disorders NOS. The majority of these patients is female. A little more is known about the incidence of binge eating disorder, a specific form of eating disorders NOS. Data from the Netherlands and international data show that binge eating disorder occurs in 1 to 2 % of the population, with a lifetime prevalence that is two to six times higher in women than in men.

How eating disorders develop is not known. Eating disorders appear to be caused by a combination of multiple factors that may reinforce each other. These factors may be categorised as follows: specific psychological factors, general psychological factors, cultural and environmental factors, hereditary factors, and biological factors (Table 4). It is unclear whether each factor has a causative or maintaining effect on the risk of developing eating disorders.

No firm conclusions may be drawn regarding the effectiveness of prevention programmes, although there are characteristics associated with greater effectiveness, such as indicated prevention rather than universal programmes.

Current prevention activities are mostly focused on individuals who are at higher risk of developing an eating disorder. The expertise of intermediate target groups such as GPs, paediatricians, teachers, sports instructors and informal carers is also promoted.

Chapter 4

Prevention of overweight and obesity and the risk of eating disorders

This chapter examines what is known about the potential beneficial or adverse effects of prevention of overweight and obesity on the risk of eating disorders. Reports of unintended effects of other prevention programmes are also discussed.

4.1 Conditions for an effect of prevention programmes for overweight and obesity on the risk of eating disorders

It is unclear to what degree and how attention for preventing overweight and obesity may influence the risk of eating disorders. There are, however, a number of conditions for prevention programmes for overweight and obesity to affect the risk of eating disorders.

One condition is that the groups targeted by prevention measures also run the risk of an eating disorder. This condition is met, as the prevention of overweight and obesity targets all layers of the population, including the group with the greatest risk of developing eating disorders: girls and women between the ages of 15 and 24 years.[3,4,6,21,24-26] Additionally, binge eating disorder, binge eating and risky dieting behaviour are more common among people with overweight or obesity than among people with a normal body weight.[98,114,132 97]

Another condition is that prevention of overweight and obesity must influence risk factors for eating disorders. Factors have been identified that are associated with the development of eating disorders, but whether this correlation is

causal or helps maintain the disorders is unknown (Table 4).[3] The most plausible correlations have been found with signs of an incipient eating disorder, such as negative body image; irrational worries about weight; risky dieting behaviour; and the fear of getting fat. According to Bauer, Haines and Neumark-Sztainer, prevention programmes that emphasise weight and weight loss may stimulate risky dieting behaviour, dissatisfaction with the body, stigmatisation and weight-related teasing.[172] Because these factors are also associated with the risk of overweight and obesity, Bauer et al. expect that programmes that put weight at the forefront and stimulate weight loss are also less effective in preventing overweight. Other authors make similar points.[173,174] They base their statements on links that have been found in cross-sectional and cohort studies. These authors expect that prevention programmes that do not focus on weight, but rather emphasise healthy diet and sufficient physical activity will be more effective in preventing overweight and have no or a protective effect on the development of eating disorders.

The effect of awareness raising is generally affected by the tone of the preventive campaign as well as the determinants and influenceability of behaviour. For example, scare tactics are not effective in changing behaviour. Personal vulnerability, the effectiveness of alternative behaviour and belief that this alternative behaviour is feasible are.[175] The ultimate effect of prevention activities also depends on the influenceability of a person's eating and physical activity habits.[3] Determinants of eating and physical activity behaviour may be classified as follows: knowledge, attitude (weighing up the advantages and disadvantages of a certain behaviour), perceived social norms (what do others think of the behaviour, what do others do), perceived behavioural control (assessing own skills and abilities to adopt a behaviour) and factors in the social, cultural, physical, political and economic environment. Additionally, there are signs that personality traits such as thrill seeking or a lack of self-control promote more than one form of health-threatening behaviour.[175]

4.2 Research into the effect of prevention programmes for overweight and obesity on the risk of eating disorders

No good, controlled studies have been performed examining the effect of universal, selective, indicated or care-related prevention programmes for overweight and obesity on the incidence of eating disorders in the intervention and control groups. This is the conclusion of two recent systematic review articles examining whether programmes for preventing overweight and obesity may promote the

development of eating disorders in children.[57,176] No systematic reviews have been published for adults.

Research has been done into the effects of prevention of overweight and obesity on factors associated with the development of eating disorders, which are often signs of an incipient eating disorder. This study primarily examined effects of universal and care-related prevention. No research has been done examining this effect for selective prevention, and hardly any for indicated prevention.

4.2.1 *Universal prevention*

Most universal prevention programmes are implemented in schools.

Children

Carter and Bulik[176] made an inventory of 22 controlled studies into the effect of universal prevention of overweight and obesity on signs of incipient eating disorders in children. This included underweight, binge eating, risky dieting behaviour, restrained eating and excessive physical activity. The interventions assessed emphasised healthy diet and sufficient physical activity.

The first conclusion of the Carter and Bulik review article concerns data quality: only a small number of studies looked at signs of an incipient eating disorder – binge eating, undesired compensatory behaviour and dissatisfaction with the body – and the methods used were not always optimal. Extensive data was collected on weight change and physical activity, but this was not reported in a way that allows the number of children losing weight or exercising excessively to be identified.[176]

The second conclusion of the review article is that it is still too early to draw conclusions about the impact of universal prevention programmes on eating disorders. Most studies did not find significant differences between the intervention and control groups in terms of signs of an incipient eating disorder. The studies that did find significant differences largely tended to suggest a protective effect on signs of an incipient eating disorder.[176] Only one study showed a single outcome measure, risky dieting behaviour* – such as skipping meals and fasting – to be promoted by a prevention programme.[176-178]

The second review article[57] examined whether universal prevention programmes at schools increase the incidence of underweight or contribute to

* This dieting behaviour was determined using the Elementary school version of the McKnight Risk Factor Survey.[177]

weight loss among 6 to 19 year-old children with normal weight. It concluded that there was insufficient data to assess the impact of prevention programmes on these undesirable effects, which is consistent with Carter and Bulik's conclusion.[176]

The above meta-analyses encompass publications up to 2005. Since then, new research into potential effects of prevention programmes for overweight and obesity at schools has been published (Table 5). Various studies have examined whether these prevention programmes influence the incidence of risky dieting behaviour, directed weight loss, dissatisfaction with the body and underweight.

There is only one study in which the schools in the control group were also exposed to a prevention programme. [179] In this study, Austin et al examined whether prevention programmes at schools influence the development of risky dieting behaviour in girls in early adolescence, in the form of self-induced vomiting or the use of laxatives or diet pills to prevent weight gain or promote weight loss.[179] The prevention programme aimed to promote healthy diet, stimulate physical activity and reduce TV watching. Additionally, schools were aided in defining policies on nutrition and physical activity. In the study, the risk of developing risky dieting behaviour had more than halved in the group of girls who had completed the two-year prevention programme compared to those in the control group. No effect was found on risky dieting behaviours in boys.[179]

In other studies, the control group did not receive a prevention programme, but followed the normal curriculum. All of these prevention programmes were entirely or partially implemented through the school, and focused on improving nutrition, increasing physical activity and decreasing television watching, involving not only the children but also their families.[180-185] One of these studies was also performed by Austin et al. The study concluded that a prevention programme lowered the risk of developing risky dieting behaviours (i.e. self-induced vomiting or use of laxatives or diet pills) in girls when compared to the normal curriculum. No effect was found on risky dieting behaviours in girls that were already dieting or in boys.[180] Other studies into prevention programmes did not find after two to four years any differences in percentages of individuals striving for weight loss[182], with a negative body image[181] or underweight.[181-183] In one study, a prevention programme lowered the average BMI of children in the intervention group compared with the group following the normal curriculum, but this drop was limited to overweight children. No differences in attitudes towards food were found between this intervention group and the group following the normal curriculum.[184] Finally, one Dutch study combining universal and indicated prevention found a decrease in the number of girls worrying about their weight in the control group, but not in the intervention group. The authors cannot

draw conclusions based on this finding, because the groups were too small to classify into weight categories. There was no increase in the number of children with overweight.[185] Another study in which snacks with a low nutritional value were either removed from the school cafeteria or not did not find any differences between the intervention and control groups in terms of worries about weight and attempts to lose weight.[186]

Adults

Hardly any research has been conducted into the effects of universal prevention of overweight and obesity on signs of incipient eating disorders in adults. An exception is the evaluation of the Nutrition Centre's Balance Day in 2007, about 18 months after its launch. The Balance Day focuses on preventing weight gain by compensating days of excess eating with days of less eating and/or more physical activity. There are no signs from a randomised, controlled intervention study and a qualitative study that the Balance Day promotes intensive or risky dieting behaviour in the form of leaving out potatoes, rice or meat without compensating, eating less at breakfast or the use of diet pills or laxatives.[187,188] These studies only looked at how people used or intended to use the Balance Day. Actual behaviour was not measured.

Because the Balance Day taken to extremes resembles bulimic eating behaviour, there is some concern about the potential for undesired effects. People with retrained eating behaviour who know they will be eating a calorie-limited diet for a week eat more the day before than if they do not expect caloric limitation. People who do not exhibit restrained eating behaviour do not let their energy intake be affected by this knowledge.[189] In another study, women who were dieting were given the choice between a high-calorie and low-calorie cookie. Women who were planning to compensate for the consumption of the cookie were more likely to chose the calorie-rich cookie.[190] These findings could indicate that if people with restrained eating behaviour plan on taking a Balance Day, they anticipate by eating more the day before. This entails the risk of overcompensating and developing a bulimic eating pattern.

In general, the effect of mass media awareness-raising campaigns on behaviour is modest at best. Programmes with demonstrable effects combine mass media awareness-raising activities with other activities, such as changes to the target group's environment.[175] On the one hand, the effects of awareness-raising campaigns should not be overestimated, but on the other hand a small effect cannot be ruled out.

Table 5 Summary of recent studies into the impact of universal prevention programmes for overweight and

Author	Number of schools Sample size, age at start	Intervention
Austin *et al*. 2005[180]	10 schools, 480 girls, 10-14 years old	Intervention: Prevention programme (*Planet Health*) focused on healthy diet, physical activity and reducing television watching Control: standard curriculum
Austin *et al*. 2007[179]	13 schools, 749 girls and 702 boys, ages not reported (*grades 6 and 7 in middle school)*	Intervention: Stimulating healthydiet and physical activity with the *Planet Health Curriculum* and *School Health Index for Physical Activity and Healthy Eating* Control: only module 1 of the *School Health Index*, focused on school policy, environment and drafting a plan of action, which is evaluated in a report after 2 years.
Plachta-Danielzik *et al*.[183]	32 primary schools, 1764 children, 6-10 years old	Intervention: messages about healthy diet, physical activity and watching television for children, parents and teachers. Control: standard curriculum.
Foster *et al*.[181]	10 schools, 1349 children, average age 11 years old	Intervention consists of five components: school self-assessment; education about nutrition; nutritional policy; social marketing and parents (*School Nutrition Policy Initiative)*. Control: standard curriculum.
Meima *et al*. 2008[185]	16 schools, 1273 children, average age 8 years old, and 1143 children, average age 12 years old	Intervention: change in environment, more physical activity and lessons about energy balance and health lifestyles for children; parents receive education and consultation by a youth nurse if their child is overweight (*Lekker fit! Campaign)*. Control: standard curriculum.
Sanigorski *et al*.[182]	26 schools, 2084 children, 4-12 years old	Intervention: Society-wide programme stimulating healthy diet, physical activity and a healthy weight for children and their family (*Be Active Eat Well)* Control: standard curriculum.
Marcus *et al*. 2009[184]	10 schools, 3135 children, 6-10 years old	Intervention: Stimulating the use of low-fat dairy products and whole-wheat bread and removing candy and sweetened drinks, increasing physical activity at school and during after school activities. Control: standard curriculum. Parents only received information about the objective of the study, not the content of the study.
Schwartz *et al.* 2009[186]	6 schools, 501 children in the first year and 495 other children in the second year, age not reported (middle school)	Intervention: removing snacks with a poor nutritional value from the school's offerings. Control: standard curriculum.

obesity on pathological eating behaviour

Psychological measures	Outcome for psychological measures
Risky dieting behaviour (modified from the Centers for Disease Control and Youth Risk Behavioural Surveillance System): self-induced vomiting or use of laxatives or diet pills in the past 30 days.	After a 21-month follow-up: 6.2 % of girls in the control schools and 2.8 % of girls in the intervention schools reported risky dieting behaviour (OR=0.41, 95% confidence interval 0.22-0.75). The effect appears to be limited to girls who were not dieting at the beginning of the study.
Risky dieting behaviour (modified from the Centers for Disease Control and Youth Risk Behavioural Surveillance System): self-induced vomiting or use of laxatives or diet pills in the past 30 days.	After a 2-year follow-up: 3.6 % of girls in the control schools and 1.2 % of girls in the intervention schools reported risky dieting behaviour (OR=0.33, 95% confidence interval 0.11-0.97).
Underweight (< 10th percentile).	After a 4-year follow-up: prevalence of children with underweight has not changed in the intervention or control group.
Underweight; dissatisfaction with the body (*Eating Disorder Inventory-2)*.	After a 2-year follow-up: no effect on the incidence, remission or prevalence of underweight or dissatisfaction with the body.
Perception of own weight.	After a 1-year follow-up: girls in the intervention group are slightly more worried (from 61% to 63%) about their weight than girl in the control group (from 57% to 49%).
Underweight; self-reported information about satisfaction with figure and body weight, attempts to lose weight, episodes of teasing.	After a 3-year follow-up: no effect on the prevalence of underweight; dissatisfaction with the body; attempts to lose weight in the past year; or weight-related teasing.
Attitudes towards eating (Children's Eating Attitudes Test).	After a 4-year follow-up: no effect on attitudes regarding eating.
3 questions about worries about weight and whether students try to lose weight (from the *School-Based Nutrition Monitoring student questionnaire*).	One year after removing snacks: no effect on worries about weight and attempts to lose weight.

4.2.2 Selective prevention

The committee is not aware of any research into the effects of selective prevention of overweight and obesity on signs of an incipient eating disorder in groups at high risk of overweight or obesity such as non-western immigrants and people with a low socioeconomic status.

4.2.3 Indicated prevention

Indicated prevention of overweight in the form of weight loss with professional supervision does not appear to have any negative effects on the risk of eating disorders in children, and can reduce binge eating in adults.[191-194]

Additionally, limited research is available on the effects of indicated prevention for overweight in children on the behaviour of parent and child. Effects on signs of an incipient eating disorder in children may in part be influenced by parents. Research from Great Britain and the United States shows that the use of BMI charts does not help raise parental awareness of their child's overweight. Research into whether the use of these cards also leads to changes in behaviour aimed at achieving a healthy weight or in weight itself do not yield clear results. There are signs from various studies that the use of these cards causes parents to encourage their children to diet, avoid certain foods and become more active, or at least plan to do so. As previously noted, dieting is not necessarily harmful: it depends on how it is done. Despite explicit advice, only a proportion of parents indicate they will seek professional help.[195,196]

In the state of Arkansas in the United States, the use of BMI charts was made mandatory in all schools in 2003. After four years, pupils in Arkansas reported no change in weight-related teasing, no increase in worries about weight, and no increase in dieting behaviour or use of diet pills.[196] During this period, risky dieting behaviour among youths decreased slightly on a national level. A comparison of state and national data indicated that pupils in Arkansas who had taken part in an indicated prevention programme using BMI charts in 2007 used significantly more diet pills, powders and drinks and laxatives, and vomited more often to control their weight than peers from a national survey. The differences were small, however. The percentage of young people exhibiting one of these forms of behaviour was between 5 and 10 percent in both groups.[195]

4.2.4 *Care-related prevention*

There are no signs that the treatment of obesity – particularly professionally supervised weight loss – influences the development of eating disorders among children and adults.

One review based on five studies concluded that in children and adolescents, professionally supervised weight loss programmes entail minimal risks for the development of eating disorders.[191] Another review article[197] examined three studies, none of which found differences in the incidence of eating disorders or body image between groups using a professionally supervised weight loss diet and the control group.

In adults with obesity who did not suffer from binge eating prior to treatment, moderate calorie restriction (a diet with a caloric value of 500 to 700 kilocalories lower than the usual intake) combined with behavioural therapy to promote weight loss did not cause binge eating. In adults who suffered from repeated binge eating episodes prior to treatment, weight loss can decrease the frequency of binge eating in the short term. In general, mental welfare improvements are also seen during weight loss; these improvements disappear once the patient regains weight.[192] In a previous study, the decrease in the number of binge eating episodes appears to be greater as more weight is lost.[198]

4.2.5 *Unintended effects in other prevention programmes*

As very little good research into unintended effects of prevention programmes for overweight and obesity is available, the committee also looked for examples of unintended effects of other prevention programmes. The committee found almost no such reports*.[199]

The evaluation of prevention campaigns is generally focused on effectiveness and reasons why a (health) message does not come across or has no effect.[200]

* An exception to this rule is a cross-sectional study into the prevention of starting smoking in young people. In this study, the frequency of exposure to anti-tobacco commercials was associated with an increased chance of smoking. This finding was countered by the finding in the same study that the number of classes about smoking was associated with a small decrease in smoking and intention to start smoking.[199]

4.3 Conclusion

No research has been conducted into the effects of prevention of overweight and obesity on eating disorders; however, studies have been conducted examining the effects on signs of incipient eating disorders. A large proportion of these studies have methodological problems such as the absence of a placebo treatment in the control group. Furthermore, signs of incipient eating disorders are difficult to measure optimally. These qualitatively limited studies did not show any clear indications that prevention of overweight and obesity affects signs of incipient eating disorders (Table 6).

However, two areas deserve further attention. Firstly, there is a possibility that universal and selective prevention programmes focused on healthy diet and appropriate physical activity may be protective for factors associated with developing eating disorders. Secondly, people with restrained eating behaviour may consume more energy if they plan to eat less the next day, for example by taking a Balance Day.

Table 6 Summary of conclusions with level of evidence (details in Annex D)

It is probable (level 2) that:

- Universal prevention programmes for overweight have no influence on underweight in children.
  B[57,181-183]
- Universal prevention programmes for overweight have no or a protective influence on signs of incipient eating disorders in children.
  B[176]
- Universal prevention programmes for overweight decrease the use of diet pills, laxatives and self-induced vomiting in order to maintain or lose weight in girls who are not already dieting.
  A2[179], B[180]
- Indicated and care-related prevention programmes (weight loss under medical supervision) do not influence signs of incipient eating disorders in children with overweight or obesity.
  B[191,197]
- Indicated and care-related prevention programmes (weight loss under medical supervision) in individuals with overweight or obesity and binge eating can decrease the number of binge eating episodes in the short term.
  A2[193] B[192, 194]

It is possible (level 3) that:

- Universal prevention programmes for overweight have no effect on the use of diet pills, laxatives and self-induced vomiting in order to maintain or lose weight in boys and girls who are already dieting.
  B[180]
- Universal prevention programmes for overweight have no influence on signs of incipient eating disorders in adults.
  B[187], C[188]
- The use of BMI charts in indicated prevention programmes promotes the use of diet pills, powders, drinks and laxatives and self-induced vomiting for the purpose of controlling body weight.
  C[195]
- People with restrained eating behaviour increase their energy intake if they expect to start dieting.
  B[189]

Chapter 5

Prevention of overweight, obesity and eating disorders in perspective

This chapter discusses a proposal for broadening the prevention of overweight and obesity to encompass eating disorder prevention. Additionally, the committee places the effects of overweight and obesity prevention within the context of other social factors that may be associated with the development of eating disorders.

5.1 Proposal for combined prevention of overweight, obesity and eating disorders

5.1.1 A common foundation

The messages used in the prevention of overweight and obesity and the prevention of eating disorders partly overlap. Both prevention programmes emphasise healthy eating and sufficient, or in the case of eating disorders, appropriate physical activity.[201]

Some researchers in the field of eating disorders are of the opinion that the prevention of overweight and obesity can be expanded to include the prevention of eating disorders. The reason for this is that both programmes address self-worth and self-acceptance[202], and that some people with overweight or obesity also suffer from eating disorder, particularly binge eating.[132] Conversely, the latter also means that some patients with binge eating disorder or bulimia nervosa

suffer from overweight or obesity. Researchers state they expect combined prevention may make the prevention of overweight and obesity more effective.

5.1.2 *Central themes for combined prevention*

There are various ways to define goals for a combined approach. Neumark-Sztainer et al propose two: the first is based on the potential negative effects of prevention programmes focused on weight and weight loss, such as risky dieting behaviour, body dissatisfaction and stigmatisation due to weight.[172] The second consists of recommendations for health care workers in order to achieve combined prevention of overweight, obesity and eating disorders in adolescents. These recommendations are based on findings from the EAT project, which was designed to investigate social environmental factors, personal factors and behavioural factors that are related to eating and weight-related problems in adolescents. The project consisted of a cross-sectional study, a 5-year follow-up study and a qualitative study.[203] A third approach, broader than the previous two, is described in the guidelines for the prevention of obesity in children published by the Weight Realities Division of the Society for Nutrition Education in 2003. According to these guidelines, prevention should be built around total physical, mental and social health, rather than weight alone.[204]
The above approaches focus on three central themes:

- Teaching healthy diet and physical activity.
- Avoiding risky dieting behaviour.
- Gaining self-confidence and a positive body image.

A fourth theme that could be included in combined prevention programmes is improving coping mechanisms for negative emotions and stress.[153]

As theoretical and empirical foundations for the latter three of the four themes described are still weak, they should be viewed as potential parts of a prevention programme. Whether programmes implementing these four elements are successful in preventing eating disorders or improve prevention of overweight and obesity has not been examined. Effective prevention programmes focused on one of these four themes have been described, however. In some studies, this led to improvement of body image and satisfaction with the body, better methods for controlling weight and more self-confidence and personal skills in children, adolescents and young adults.[152,169,176,179,180,205-207]

There is a difference of opinion within the committee on whether improving body image should be a central message in the combined universal and selective prevention of overweight, obesity and eating disorders* or should only be a goal to be achieved through other messages. Arguments to include it as a central message are that in teens with overweight, a positive body image appears to reduce the risk of risky dieting behaviour, as well as the risk of binge eating in boys and weight gain in girls.[203,208] Furthermore, in women completely obsessed by their weight, there appears to be a direct relationship between a negative body image and overeating.[157] However, these results only apply to children and adults with overweight. Because universal and selective prevention focus on (risk groups within) the general population, including people without overweight, part of the committee doubts whether including body image as a central message is feasible and necessary. The worry exists that this additional attention may have unintended consequences.

Despite these considerations, messages about responsible dieting, gaining self confidence and improving coping mechanisms for dealing with negative emotions and stress may become part of the combined universal and selective prevention of overweight, obesity and eating disorders in addition to the central message about healthy diet and sufficient physical activity. In indicated prevention of overweight, attention may be given to a positive body image, as people with overweight and obesity often face stigmatisation. Stigmatisation may lead to a negative body image.[6] In care-related prevention of obesity, obtaining a positive body image is already part of the programme.[8]

5.2 Effects of prevention programmes in perspective

Prevention programmes for overweight and obesity are implemented against a background of multiple sociocultural factors that may affect the development of eating disorders, overweight and obesity as well as the prevention thereof. For example, the beauty ideal for women is getting thinner and thinner, and more and more muscular for men, while the number of people with overweight and obesity has grown significantly over the past 30 years. There is a large number of commercial weight loss programmes and products addressing this discrepancy.[146,209] Finally, how people deal with food depends on the cultural background. In this paragraph, whether and how these sociocultural factors play a role in the development of eating disorders and their effect on prevention of overweight and obesity is examined.

* Improving body image is a key message in the prevention of eating disorders.[153]

5.2.1 Thinness ideal

As mentioned in Chapter 3, the thinness ideal contributes to many people's desire to lose weight and be thinner. But this factor alone is not enough to explain why only 1 to 3 percent of people who diet to lose weight develop an eating disorder. Psychological risk factors such as a lack of self-confidence, negative self-image and negative body image play a key role in the process.[3,153]

The thinness ideal appears to have an effect in overweight and obesity as well.[210] It seems that the thinness ideal can promote the stigmatisation of people with obesity, which can lead to a negative self-image and all associated psychosocial problems.[6]

5.2.2 Commercial weight loss programmes

A large number of commercial weight loss programmes address the consumer's need to lose weight. These vary from weight loss tea from the chemist's to following weight loss advice from popular diet gurus to weight loss competitions on television. In order to provide an impression of the size of the diet industry: in the late 1990s, the industry-generated income was about 50 billion dollars in the United States alone.[211] With a few notable exceptions, there is no solid evidence for the effectiveness of these weight loss programmes and products in terms of weight loss.[212,213] Some weight loss products even pose a health risk.[214]

The committee is not aware of research examining whether these weight loss programmes and products affect factors associated with the development of eating disorders. Furthermore, it remains unclear to what degree these commercial prevention programmes influence government messages on prevention of overweight and obesity.

5.2.3 Cultural background

Little is known about the incidence of eating disorders among Dutch citizens with a non-western background, as mentioned previously in chapter 3.

Dutch people with non-western backgrounds who wish to become thinner or attempt to lose weight appear ambivalent with regard to the thinness ideal, as they still also hold more traditional views about ideal body shapes. In these groups, social norms about body shape, the social character of eating and hospitality may form a significant barrier to weight control.[215,216] Such cultural differences should be taken into account in prevention programmes.

5.3 Conclusion

There are calls in the literature for expanding universal and selective prevention of overweight and obesity to include the prevention of eating disorders, because there is overlap between both forms of prevention. Central themes are teaching healthy diet and appropriate physical activity; avoiding risky dieting behaviour; increasing self-confidence; and improving coping mechanisms for dealing with negative emotions and stress. However, this combined approach has not yet been studied to determine effectiveness, although some studies examining sub-aspects of such a programme found better weight management methods, increased self-confidence and improved personal skills.

This advisory report is focused on the potential influence of overweight and obesity prevention on the risk of eating disorders. In addition to prevention programmes for overweight and obesity, there are also other sociocultural factors that may play a role in the development of eating disorders, overweight and obesity as well as the prevention thereof. These include the effects of the thinness ideal, commercial weight loss programmes and products, and cultural differences.

Chapter 6

Conclusions and recommendations

This advisory report focuses on two main questions, namely whether there are signs that the prevention of overweight and obesity has a beneficial or adverse effect on the risk of eating disorders, and whether changes to preventive policy need to be made to prevent eating disorders. Two sub-questions will be answered regarding the definition of, the occurrence of, and prevention of overweight and obesity and eating disorders, respectively.

6.1 Conclusions

6.1.1 Overweight and obesity

The number of adults with obesity is still growing

Overweight (BMI between 25 and 30 kg/m^2) increases the risk of type II diabetes, cancer and cardiovascular disease in adults, while children with overweight run a greater risk of overweight as adults. Obesity (BMI > 30 kg/m^2) can have severe social, mental and physical effects on adults and children. In recent years, the percentage of adults with overweight appears to have stabilised at around 36 percent. Eleven percent of all adults is obese, and the number is still growing. 14% of children with a Dutch cultural background was overweight in 2010, and 2% were obese.

Overweight and obesity are caused by a long-term imbalance between calorie consumption and use

Overweight and obesity develop if energy intake exceeds energy expenditure for a long period of time. No dominant factor influencing this energy balance – or rather, imbalance – has been identified. The influence of environmental factors, the so-called obesogenic environment, appears to play a key role in the obesity epidemic.

Current prevention of overweight and obesity is focused on healthy diet and sufficient physical activity

Prevention programmes for overweight are categorised based on which target groups or individuals they address and the risk these groups have of developing overweight or obesity:

- Universal prevention is focused on the general population.
- Selective prevention targets – unrequested – groups in the population with a (high) risk of overweight or obesity, such as non-western immigrants and people with a low level of education.
- Indicated prevention targets individuals with overweight.
- Care-related prevention targets individuals with obesity.

For universal and selective prevention projects, the emphasis lies on healthy diet and physical activity, in accordance with the *2006 Guidelines for a healthy diet* by the Health Council. In creating these projects, research, theory and practice are linked with increasing frequency. Until recently, indicated and care-related prevention focused on preventing weight gain or promoting weight loss. Currently, the emphasis in these two forms of prevention has also shifted towards healthy diet and sufficient physical activity.

6.1.2 Eating disorders

Definitions of eating disorders, signs of incipient eating disorders and consequences

In this advisory report, the term eating disorders encompasses anorexia nervosa, bulimia nervosa and eating disorders not otherwise specified (NOS), which includes binge eating disorder. The first two disorders are characterised by compulsive control of body weight via eating patterns. A person with anorexia ner-

vosa refuses to maintain a body weight at or above the normal weight for age and height. A person with bulimia nervosa has episodes of binge eating, during which large amounts of food are consumed in a short time, followed by attempts to compensate for the effects of binge eating on weight (including self-induced vomiting and/or laxative use). People with an eating disorders NOS show some symptoms of one or more eating disorders, such as anorexia nervosa, bulimia nervosa or binge eating disorder, or suffer from binge eating disorder. Binge eating disorder is similar to bulimia nervosa, but the episodes of binge eating are not compensated.

Signs of an incipient eating disorder: negative body image; irrational worries about weight; the fear of getting fat; risky dieting behaviour in the form of eating extremely little, skipping meals, self-induced vomiting and use of laxatives and diuretics.

Eating disorders can have severe social, mental and physical effects.

Eating disorders are more common in women than men

Anorexia nervosa and bulimia nervosa occur primarily among 15 to 24 year-old women. In young women, the annual incidence of anorexia nervosa is 0.4 percent, and that of bulimia nervosa is 1.5 percent. In clinical practice, only a few percent of patients are men. Research performed in general practice showed 5 percent of patients with anorexia nervosa to be male. Little is known about the occurrence of anorexia nervosa and bulimia in groups younger than 15 years of age. Anorexia nervosa is seen sporadically in children, while bulimia nervosa is extremely rare in young children who are not yet sexually mature.

There is also no information available on the incidence of eating disorders NOS in the Netherlands. A limited number of international studies have examined this disorder, despite the fact that 60% of patients with an eating disorder are classified as having an eating disorders NOS. The majority of these patients is female. A little more is known about the incidence of binge eating disorder, a specific form of eating disorders NOS. Data from the Netherlands and international data show that binge eating disorder occurs in 1 to 2 % of the population, with a *lifetime* prevalence that is two to six times higher in women than men. The risk of binge eating increases with body weight and BMI.

Eating disorders appear to begin at an increasingly young age

The incidence of anorexia nervosa appears to have shifted towards the younger age group of 15 to 19-year-olds, and that of bulimia nervosa towards the younger

age group of 15 to 24-year-olds between the late 1980s and the late 1990s. This shift may be explained by improved registration and early diagnosis.

No data is available to confirm whether the incidence of eating disorders has changed since the government implemented an active policy for the prevention of overweight and obesity in 2003.

6.1.3 The effect of prevention of overweight and obesity on the risk of eating disorders

Assumption: prevention of overweight and obesity may influence the risk of eating disorders both favourably and unfavourably

There are two conditions for prevention programmes for overweight and obesity to affect the risk of eating disorders. The first condition is that the group at relatively high risk of eating disorders is a target group or is reached by prevention programmes for overweight and obesity. This condition is met by universal and selective prevention projects. The second condition is that prevention of overweight and obesity affects factors associated with developing eating disorders. Of these factors, signs of an incipient eating disorder, such as negative body-image; irrational worries about weight; risky dieting behaviour; and the fear of getting fat seem to be the most obvious.

Whether this effect is positive or negative may depend on the prevention programme's message. According to the literature, prevention programmes that emphasise weight and weight loss may stimulate risky dieting behaviour, dissatisfaction with the body, stigmatisation and weight-related teasing. The expectation is that prevention programmes that do not focus on weight, but rather emphasise healthy diet and sufficient physical activity will be more effective in preventing overweight and have no or a protective effect on the development of eating disorders.

Little good research is available on the relationship between prevention of overweight and obesity and the risk of eating disorders

A majority of the research examining whether prevention of overweight and obesity influences signs of incipient eating disorders has methodological limitations. Most studies lack a control treatment. The signs of an incipient eating disorder were often not measured optimally. The risk of excessive physical activity was not examined.

These studies, of limited quality, found no or a protective effect on the risk of eating disorders, and do not provide reasons for changing current prevention policy for overweight and obesity

The research findings do not provide reasons for making changes to current policy on the prevention of overweight and obesity. The majority of the universal prevention programmes focuses on healthy diet and a healthy lifestyle, which has no or possibly a protective influence on signs of incipient eating disorders. No studies have been conducted examining the effects of selective prevention programmes. Very little research has been done into indicated prevention programmes. Within indicated and care-related prevention, there are no signs that weight loss under professional supervision influences the risk of eating disorders in children. Finally, in adults with overweight and obesity who suffer from binge eating, weight loss and calorie-restricted diets with professional support can reduce the number of binge eating episodes in the short term.

Prevention programmes for overweight and obesity in perspective: other factors that may play a role in the development of eating disorders

The prevention of overweight and obesity takes place within the context of sociocultural factors that may also play a role in the development of eating disorders. Examples include the thinness ideal, commercial weight loss programmes and cultural differences. These sociocultural factors may also influence the effectiveness of prevention programmes for overweight and obesity.

There may be room for combined prevention of overweight, obesity and eating disorders

For both the prevention of overweight and obesity and the prevention of eating disorders, the emphasis lies on healthy diet and sufficient – or in the case of eating disorders, appropriate – physical activity. That is why the literature calls for expanding the universal and selective prevention of overweight and obesity with prevention of eating disorders. The additional themes should be: avoiding risky dieting behaviour, gaining self-confidence and a positive body image, improving coping mechanisms for dealing with negative emotions and stress. There is a difference of opinion within the committee on whether promoting a positive body image – one of the messages in the prevention of eating disorders – should be included as a central message or only as a goal in such a prevention programme.

The other themes may be integrated as messages within the universal and selective prevention programmes.

This combined approach has not yet been studied to determine effectiveness, although some studies examining sub-aspects of such a programme found better weight management methods, increased self-confidence and improved personal skills.

6.2 Recommendations for further study

Study the effects of current prevention programmes for overweight and obesity in relation to the risk of eating disorders

The committee feels research should be done to examine the potential beneficial or adverse effects that prevention of overweight and obesity has on signs of incipient eating disorders. This research should be integrated within existing research among children and young people, and among other things examine items including disrupted body image, risky dieting behaviour, excessive physical activity and binge eating.

Study shared risk factors for overweight and obesity and eating disorders

The committee recommends expanding existing cohort studies in children and young people to look for shared risk factors for the development of overweight and obesity and eating disorders.

Study the effects of (commercial) weight loss programmes on the risk of eating disorders and the effectiveness of prevention of overweight and obesity

The committee recommends examining whether (commercial) weight loss programmes for overweight and obesity affect factors associated with developing eating disorders, and particularly signs of incipient eating disorders. Additionally, the committee recommends the influence of weight loss programmes on the effectiveness of public prevention of overweight and obesity be investigated.

Chapter 7

Answers to the Minister's original questions

1 Is there a difference in susceptibility for eating disorders between men and women?

Yes. In clinical practice, about 98% of patients with anorexia nervosa or bulimia nervosa are women, while the percentage is around 95% for general practice. Binge eating disorder is two to six times more common among women than men. Eating disorders not otherwise specified (NOS), including binge eating disorder, are also more common in women than in men, although solid data is lacking.

A Finnish two-phase study among girls and young women found a lifetime prevalence of 2.2 percent for anorexia nervosa and of 2.3 percent for bulimia nervosa.[116,117] Lifetime prevalence figures for anorexia nervosa are lower in older birth cohorts. According to studies conducted among European and American adults, lifetime prevalence of anorexia nervosa is 0.9 percent among women, and varied between 0 and 0.3 percent among men. In these studies, lifetime prevalence of bulimia nervosa varied between 0.9 and 1.5 percent among women and 0.1 and 1.5 percent among men. Finally, lifetime prevalence of binge eating disorder varied from 1.9 to 3.5 percent in women and 0.3 to 2 percent in men.[113,114] These studies did not collect any data on the occurrence of eating disorders NOS. Other research has indicated this remaining group is the largest category in both clinical practice and among the general population (Table 3).[75,76,115,130]

2 Are we seeing an increase in the number of eating disorders in teens under the age of 15 years?

This cannot be said for certain. The incidence of anorexia nervosa and bulimia nervosa in general practice appeared to have shifted towards younger age groups between the late 1980s and the late 1990s. The incidence of anorexia nervosa among girls between the ages of 15 and 19 years almost doubled from 0.06 to 0.11 percent per year, while the incidence among women between the ages of 20 and 34 years dropped. For bulimia nervosa, the high-risk group shifted from 25 to 29-year-olds to 15 to 24-year-olds in the same period.[112]

Based on these data, it cannot be concluded that anorexia nervosa or bulimia nervosa are occurring at younger ages. This is because early diagnosis of anorexia nervosa and bulimia nervosa improved during this period, family doctors may have become better at recognising symptoms, and awareness of eating disorders has increased in the general public under the influence of the media.[112] However, it cannot be ruled out that the age at which eating disorders develop has dropped. For example, specialist treatment centres treat anorexia nervosa patients under the age of 12 years with increasing frequency.[126] Exact figures are not available.

The committee is not aware of any studies in other western nations in which a shift of the incidence of anorexia nervosa from older to younger age groups has been reported. Insufficient research has been done to draw any conclusions regarding the incidence and prevalence of eating disorders NOS or binge eating disorder among teens younger than 15 years of age, let alone to comment on any trends.

3 Eating disorders with names like Orthorexia nervosa and Anorexia athletica are mentioned in popular media outlets. How do these 'popular eating disorders' relate to current prevention policy on overweight and healthy diet?

The committee is not aware of any scientific research examining the relationship between the prevention of overweight and obesity and the risk of orthorexia nervosa or anorexia athletica. The committee has only investigated the link between awareness raising about healthy diet as part of the prevention of overweight and obesity. Orthorexia nervosa and anorexia athletica are not official eating disorders, which makes investigating them difficult. Orthorexia nervosa is extreme, compulsive healthy eating.[3] Regarding anorexia athletica, there has been debate

while drafting the DSM-5 about whether excess physical activity should be included in the definition of eating disorders.[85] Orthorexia nervosa and anorexia athletica describe behaviour that may signal the start of an eating disorder or may already be part of an eating disorder.[3]

One important comment on your question is that it is not entirely clear how eating disorders develop. Eating disorders appear to be caused by a combination of multiple factors that may reinforce each other. Alone, each individual factor is not enough to cause an eating disorder.[3] The literature assumes that the effect of overweight and obesity prevention on the risk of eating disorders depends on the target of the prevention. Prevention focused on weight and weight loss may increase the risk of eating disorders in susceptible individuals. On the other hand, prevention focused on healthy diet and appropriate physical activity may have protective effects.[172-174]

4 Can the Ministry of Health, Welfare and Sport make changes to current prevention policy for overweight and obesity in order to avoid promoting the developing of eating disorders?

The committee sees no immediate reasons for changing current prevention policy. Research does not yield any clear signs that prevention of overweight and obesity with a focus on healthy diet and sufficient physical activity has an unfavourable effect on signs of incipient eating disorders such as underweight, binge eating, undesired compensatory behaviour and a negative body image.[57,176]

However, the problem is the poor methodological quality of most of the research into the effects of prevention programmes for overweight and obesity on signs of incipient eating disorders. Available research provides no or minimal insight into the effects on negative body image; irrational worries about weight; risky dieting behaviour in the form of eating extremely little, skipping meals, self-induced vomiting and use of laxatives and diuretics; and the fear of getting fat.[3,57,176] The methods used to measure these factors were often suboptimal.[57,176] Therefore, the committee recommends researching the effects of current preventive policy on these factors within the context of existing research, particularly among children and young people. It also recommends studies be performed examining shared risk factors for developing overweight, obesity and eating disorders within existing cohort studies of children and young people.

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Annexes

Annex **A**

Request for advice

Letter of 28 July 2008 (letter reference: VGP/VV 2864984) on behalf of the Minister of Health Welfare and Sport to the chairman of the Health Council of the Netherlands.

I hereby request that you perform an exploratory study into the question of whether increased attention for overweight and obesity is a risk factor for developing eating disorders, and provide me with a report on the subject.

Overweight and obesity among adults and children has been a growing problem since 1980, which has been given increasing attention by the media and in other outlets in recent years. The Ministry of Health, Welfare and Sport has started initiatives focused on preventing overweight, including:

- Foundation of the Overweight Covenant, chaired by Paul Rosemöller (2004),
- National roll-out of the Hello World intervention by minister Hoogevorst (2006)
- Overweight as 1 of the 5 policy spearheads in the prevention memorandum: “Choosing a healthy life”(2007-2011),
- Publication of a prevention manual for overweight in local health policy (2007),
- Foundation of the Netherlands Overweight Partnership (2008),
- Various national campaigns, including the ‘Balance Day’ by the Nutrition Centre (since 2004).

All of these efforts and initiatives have not (yet) led to a decrease in overweight (and obesity) among the Dutch population, but have put the topic on the agenda both nationally and internationally. A

downside to this increased attention for the prevention of overweight is the potential focus on eating patterns disrupted to such an extent that they lead to the development of eating disorders. This includes the conditions Anorexia and Bulimia nervosa and binge eating disorder. The first two are focused on compulsive control of body weight via eating habits. Binge eating disorder has a different background (see also: www.akademievooreetstoornissen.nl).

Disorders such as Prader-Willi syndrome, Cushing syndrome and hypothyroidism are not included in this definition. These disorders are (more or less clearly) due to genetic or physiological defects.

There have been signals from society for some time, including from scientists, that current attention for prevention of overweight increases the risk of developing eating disorders among teens and (young) adolescents.

Given the above, I request that you perform an exploratory study, looking specifically at the following questions:

1 Is there a difference in susceptibility for eating disorders between men and women?
2 Are we seeing an increase in the number of eating disorders in teens under the age of 15 years? See also the "Signal report on the prevention of eating disorders" published by Trimbos (enclosed).
3 Eating disorders with names such as Orthorexia nervosa* and Anorexia athletica** are being mentioned in popular media outlets. How do these 'popular eating disorders' relate to current prevention policy on overweight and healthy diet?
4 Can the Ministry of Health, Welfare and Sport make changes to current prevention policy for overweight and obesity in order to avoid promoting the development of eating disorders?

This exploratory study is part of the 2009 draft working programme of the Health Council of the Netherlands.
I look forward to receiving the results by early 2010 at the latest.

On behalf of the Minister of Health, Welfare and Sport,
the Director General for Health,
ir. J.J.M. de Goeij

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* Ortho is Greek for pure, correct, right and orexis means appetite. Orthorexia nervosa refers to a fixation on eating healthy foods. This form of extreme and compulsive behaviour may constitute a risk for the development of an eating disorder. In orthorexia, growing numbers of food items are taken off the menu, particularly those that contain a relatively large number of calories, fat or sugars. Children and adults who grow increasingly obsessed by healthy foods run the risk of going too far and developing an eating disorder, particularly when combined with other psychological risk factors.

** Extreme amounts of sports or physical activity is considered a characteristic of eating disorders, and is also a specific risk factor for developing an eating disorder. In people with normal weight, extreme exercise may lead to weight loss while they consume relatively normal amounts of food. Some individuals continue engaging in sports for longer and more fanatically in order to increase performance. Particularly for men, this may be a strategy to lose weight without having to diet. This is referred to as Anorexia athletica.

Annex **B**

The committee

- Prof. I.D. de Beaufort, *chairperson*
  Professor of health ethics, Erasmus Medical Center, Rotterdam
- Prof. J. Brug
  Professor of epidemiology, Free University Medical Center, Amsterdam
- Dr K.E. Davis
  Senior women's studies researcher, University of Utrecht
- Dr E.F. van Furth
  Clinical psychologist, Ursula Eating Disorders Center, Leidschendam
- Prof. H.W. Hoek
  Head of psychiatry training, Parnassia Bavo group, The Hague and professor of psychiatry, Groningen University Medical Center
- Prof. A.T.M. Jansen
  Professor of psychology of eating disorders, University of Maastricht
- Prof. F.J. Meijman
  Professor of medical science and public communication and the history thereof, Free University Medical Center, Amsterdam
- ir. R.J. Metaal, *advisor*
  Ministry of Health, Welfare and Sport, the Hague
- Dr G. Noordenbos
  Clinical psychologist, University of Leiden

- Dr A. Oenema
  University lecturer on determinants of healthy behaviour, Erasmus Medical Center, Rotterdam
- Prof. J.A. Romijn
  Professor of endocrinology, Leiden University Medical Center
- Prof. J.C. Seidell
  Professor of nutrition and health, Free University, Amsterdam
- Dr T. van Strien
  Psychologist, Radboud University Nijmegen
- Dr R.M. Weggemans, *scientific secretary*
  Health Council of the Netherlands, The Hague

The Health Council and interests

Members of Health Council Committees – which also include the members of the Advisory Council on Health Research (RGO) since 1 February 2008 – are appointed in a personal capacity because of their special expertise in the matters to be addressed. Nonetheless, it is precisely because of this expertise that they may also have interests. This in itself does not necessarily present an obstacle for membership of a Health Council Committee. Transparency regarding possible conflicts of interest is nonetheless important, both for the President and members of a Committee and for the President of the Health Council. On being invited to join a Committee, members are asked to submit a form detailing the functions they hold and any other material and immaterial interests which could be relevant for the Committee's work. It is the responsibility of the President of the Health Council to assess whether the interests indicated constitute grounds for non-appointment. An advisorship will then sometimes make it possible to exploit the expertise of the specialist involved. During the establishment meeting the declarations issued are discussed, so that all members of the Committee are aware of each other's possible interests.

Annex **C**

Definitions of eating disorders

Definitions of eating disorders according to the *Diagnostic and Statistical Manual of Mental Disorders IV* (DSM-IV, American Psychiatric Association, 1994). Taken from the 2006 Multidisciplinary guideline Eating Disorders.[3]

Anorexia nervosa

Anorexia nervosa is an eating disorder characterised by a refusal to maintain a body weight at or above the normal weight for age and height. Patients with anorexia nervosa are usually extremely emaciated. Two types of anorexia nervosa are identified: the restricting type that does not purge (self-induced vomiting or laxative, diuretic or enema abuse) and does not binge eat, and the type that does binge eat and/or purge.

DSM-IV 307.1 Anorexia nervosa

A Refusal to maintain body weight at or above a minimally normal weight for age and height (e.g. weight loss leading to maintenance of body weight less than 85% of that expected; or failure to

make expected weight gain during period of growth, leading to body weight of less than 85% of that expected).

B Intense fear of gaining weight or becoming fat, even though underweight.

C Disturbance in the way in which one's body weight or shape is experienced, undue influence of body shape on self-evaluation, or denial of the seriousness of the current low body weight.

D In postmenarcheal females, amenorrhea, i.e. the absence of at least three consecutive menstrual cycles. (A woman having periods only while on hormone medication (e.g. oestrogen) qualifies as having amenorrhoea).

Specify the type:

- Restricting type: during the current episode of anorexia nervosa, the person has not regularly engaged in binge eating or purging behaviour (self-induced vomiting or misuse of laxatives, diuretics, or enemas).
- Binge eating/purging type: during the current episode of anorexia nervosa, the person has regularly engaged in binge eating or purging behaviour (self-induced vomiting or misuse of laxatives, diuretics, or enemas).

Bulimia nervosa

Bulimia nervosa is characterised by episodes of binge eating during which very large amounts of food are consumed within a short period, followed by attempts to counter the effects of binge eating on weight. Two types are also identified for bulimia nervosa: the purging and the non-purging type. The non-purging type generally does not display purging behaviour, but displays other inadequate compensatory behaviour for the episodes of binge eating, such as fasting or extreme physical activity.

DSM-IV 307.51 Bulimia nervosa

A Recurrent episodes of binge eating. An episode is characterised by both: Eating, in a discrete period of time (e.g. within any 2-hour period), an amount of food that is definitely larger than most people would eat during a similar period of time and under similar circumstances. A sense

of lack of control over eating during the episode (such as a feeling that one cannot stop eating or control what or how much one is eating).

B Recurrent inappropriate compensatory behaviour to prevent weight gain, such as self-induced vomiting, misuse of laxatives, diuretics, enemas, or other medications, fasting, or excessive exercise.

C The binge eating and inappropriate compensatory behaviour both occur, on average, at least twice a week for 3 months.

D Self evaluation is unduly influenced by body shape and weight.

E The disturbance does not occur exclusively during episodes of anorexia nervosa.

Specify the type:

- Purging type: during the current episode of bulimia nervosa, the person has regularly engaged in self-induced vomiting or the misuse of laxatives, diuretics, or enemas.
- Non-purging type: during the current episode of bulimia nervosa, the person has used other inappropriate compensatory behaviour but has not regularly engaged in self-induced vomiting or misused laxatives, diuretics, or enemas.

Binge eating disorder

Binge eating disorder may be defined as bulimia nervosa without compensatory behaviour. Binge eating disorder is a new category within the DSM-IV. This category has only been introduced as a 'tentative diagnosis', meaning criteria for further research have been proposed with the objective of deciding whether the category will be recognised as an 'official' eating disorder at a later date. While the scientific debate continues, binge eating disorder has been accepted as a condition in clinical practice. Formally, it is classified as eating disorders NOS. The guideline will refer to 'binge eating disorder' from here on.

DSM-IV Research criteria for binge eating disorder

A Recurrent episodes of binge eating. An episode is characterised by both: Eating, in a discrete period of time (e.g. within any 2-hour period), an amount of food that is definitely larger than most people would eat during a similar period of time and under similar circumstances. A sense of lack of control over eating during the episode (such as a feeling that one cannot stop eating or control what or how much one is eating).

B The binge-eating episodes are associated with three (or more) of the following:

- Eating much more rapidly than normal.
- Eating until feeling uncomfortably full.
- Eating large amounts of food when not feeling physically hungry.
- Eating alone because of being embarrassed by how much one is eating.

- Feeling disgusted with oneself, depressed or very guilty after overeating.

C Marked distress regarding binge eating is present.

D The binge eating occurs, on average, at least 2 days a week for 6 months.

E The binge eating is not associated with the regular use of inappropriate compensatory behaviours (e.g. self-induced vomiting, misuse of laxatives, fasting, excessive exercise) and does not occur exclusively during the course of anorexia nervosa or bulimia nervosa.

Eating disorder not otherwise specified (NOS)

Eating disorders NOS is a category for patients who have a number of, but not all characteristics of previously listed more specific eating disorders.

Orthorexia nervosa and anorexia athletica

Orthorexia nervosa and anorexia athletica are not official eating disorders. Orthorexia nervosa is extreme, compulsive consumption of healthy food.[3] Regarding anorexia athletica, there has been debate while drafting the DSM-5 about whether excess physical activity should be included in the definition of eating disorders.[85] Orthorexia nervosa and anorexia athletica describe behaviour that may signal the start of an eating disorder or may already be part of an eating disorder.[3]

Annex **D**

Search strategy

The selection of grey literature was continuous between June 2009 and May 2010. Systematic literature searches for systematic reviews and large studies encompassed all literature in the following databases: PubMed/Medline; Cochrane Database of Systematic Reviews; PsychLit; National Guideline Clearinghouse through July 2009. In some areas, the literature was supplemented by articles published between August 2009 and May 2010.

The search strategy used to answer the central question in the request for advice was: *prevention programs and eating disorders and obesity.* Database filters were used to identify meta analyses. Additionally, other search strategies were used to answer sub-questions in the advisory report, and committee members supplied additional literature.

Degree of evidence and formulation of conclusions

The assessment system used aimed to determine relationships between factors. Therefore it has no or very limited suitability when it comes to evaluating data on the incidence of eating disorders, overweight and obesity. Based on the available evidence (Table 7), conclusions were formulated, accompanied by a level of evidence according to the classification system in Table 8.

A conclusion is as strong as the study with the best level of evidence. A systematic review only leads to a level 1 conclusion if it is based on at least two independent clinical trials. If the level of evidence in a systematic review is said

to be level B or C, the conclusion based on the review can never be stronger than level 2 or 3.

Table 7 Classification of methodological quality of individual studies into relationships between exposure (e.g. prevention of overweight and obesity) and effect (e.g. the risk of eating disorders).[217]

Level	Type of study
A1	Good quality systematic review articles of at least two independently performed A2 level studies.
A2	Randomised, double-blind, comparative intervention study of good quality and sufficient size.
B	Comparative study that does not meet all characteristics listed under A2 (this includes cohort and patient-control studies).
C	Non-comparative study.
D	Expert opinion.

Table 8 Degree of evidence of conclusions.

Level	
1: Convincing	Based on 1 systematic review article (level A1) or at least 2 independently performed A2 level studies.
2: Probable	Based on 1 A2 level study or at least 2 independently performed level B studies.
3: Possible	Based on one level B or C study.
4: Insufficient	Based on expert opinion (level D).