The role of nurses in the prevention and management of obesity

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Abstract

This paper examines the current scientific knowledge on the relationship between diet and obesity, and considers the implications for nursing practice. It focuses on the main nutritional elements that have been identified as significant in the prevention and management of obesity. Research findings reveal the important role of specific dietary habits and patterns and their influence on obesity; particularly on childhood obesity. This paper discusses the nursing implications in relation to the prevention and management of obesity.

Key words: ■ Obesity ■ Cardiovascular disease ■ Prevention ■ Management ■ Health promotion ■ Diet ■ Nutrition ■ Micronutrients ■ Nursing applications

Obesity is a chronic metabolic disease, considered to be one of the main risk factors for cardiovascular disease and correlating with increased morbidity and mortality (Poirier and Eckel, 2002; NHS, 2010). Research has estimated that in England, 6.8% of all deaths are attributable to obesity (NHS, 2010). A recent study looking at data for a 27-year period concluded that about one quarter of deaths in England were directly or indirectly related to obesity (Duncan et al, 2010). According to Government estimations, obesity in England in 2001 costs about £7 billion year, and projected costs for 2015 are £19.5 billion (Foresight, 2007).

Consequences of obesity

Cardiovascular disease

Total obesity and accumulation of fat in the abdomen are considered to be independent risk factors for cardiovascular disease (Banning, 2005). The Framingham study demonstrated an independent association between coronary heart disease and being 30% overweight (Jones, 2000). The risk of cardiovascular disease is raised even with low and medium level obesity. It is estimated that a 10% increase in body weight results in a 30% increase in the risk of cardiovascular disease (Hecker, 1999). Mild obesity (body mass index (BMI) of 25-28.9) has been associated with a 50% higher risk of coronary heart disease compared to a BMI of 25 (Jones, 2000).

Atherosclerosis

In adults, obesity is linked to advanced atherosclerosis (NHS, 2010). This has been observed through its effect on various risk factors, including increased levels of low-density lipoprotein (LDL) and low levels of high-density lipoprotein (HDL), hypertension, glucose tolerance and type 2 diabetes (Hecker, 1999; Tobin and Miller, 2001; Poirier and Eckel, 2002; NHS, 2010). Adjustments and disturbances in heart function and structure have been observed in the absence of other risk factors, indicating the independent association of obesity with atherosclerosis (Poirier and Eckel, 2002).

McGill et al (1995) also found important correlations between BMI and the extent of subcutaneous fat, and the extent of fatty streaks and degree of damage in the right coronary artery in men younger than 34 (McGill et al, 1995). It has also been reported that fat is a metabolically active tissue, secreting various factors (Hauner, 2005) that seem to be related to the development of atherosclerosis (Jones, 2000).

Hypertension

Hypertension in more than 75% of cases can be attributed to obesity (Krauss et al, 1998). It is well documented that arterial blood pressure increases or decreases with body weight (NHS, 2010). Compared to non-obese men, the risk of developing hypertension is raised by 40-60% with mild obesity, doubled with medium obesity and trebled with morbid obesity (Juhaeri et al, 2002). Total cholesterol and LDL cholesterol have been found to be 23mg/dL higher in men with BMI of 27-30kg/m^2 compared to men with BMI of up to 23kg/m^2. An increase in the ratio of total cholesterol to HDL has been observed to be proportional to the increase in BMI. A positive association between obesity and blood triglycerides has also been reported (Hecker, 1999).

Diabetes

Obese people have an increased risk of developing diabetes. A BMI higher than 30 carries a risk five times more likely to develop type 2 diabetes compared to a BMI of 25 (Jones, 2000). For each kilogram of weight gain, it has been estimated that the risk of developing type 2 diabetes is increased by 9% (Chiquette and Chilton, 2002).

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Central obesity

Central obesity relates specifically to various metabolic disturbances that are collectively referred to as "the metabolic syndrome" (Hecker, 1999). Central obesity has been correlated with the development of atherosclerosis (Boden and Sacco, 2000). Angiographic studies reveal a positive association between central obesity and stenosis of the coronary arteries (Kortelainen and Särkioja, 1999; McGill et al, 2002). Selective coronary defects with fatty nuclei and increased concentrations of foam cells were observed in women with a high waist-to-hip ratio, even in those aged 20 to 30 years (Kortelainen and Särkioja, 1999).

Opportunities for health promotion

Nurses have an ideal opportunity to enhance health-promoting activities that can reduce the risk of being overweight or obese (International Council of Nurses (ICN), 2009), as educators and role models for their families, communities and patients (Lowen, 2009). For effective prevention and treatment, it is important that nurses consider the psychosocial and cultural parameters that may affect health behaviours associated with obesity (ICN, 2009). Skin care, respiratory challenges, resuscitation, medication absorption and difficulties in mobility are some of the concerns that nurses have to face with obese or overweight clients (Camden, 2009).

Aetiology

The aetiology of obesity is multifactorial; obesity can be due to genetic, metabolic and environmental factors (Raman, 2002) or a combination of these. Any intervention designed to prevent and control obesity should be related to the underlying factor(s) (Krauss et al, 1998). These include: prenatal and perinatal nutrition, intake and utilization of energy, birth weight, maternal diabetes, and socioeconomic, behavioural and cultural factors (Stettler et al, 2000).

Two behavioural factors that can be altered are low levels of physical activity, such as increased time spent watching television or using a computer, and dietary factors, such as increased intake of energy (Nicklas et al, 2001). This review outlines the association of diet with the development of obesity in developed countries and delineates the role that nurses can play in all levels of obesity prevention.

Diet and obesity

Dietary factors associated with the development of obesity are complex and still not fully understood (Nicklas et al, 2001). Research has implicated various nutrients (including fat, protein, carbohydrates), foods such as soft drinks and fast foods, and dietary behaviour, such as frequency of eating and meal size (Nicklas et al, 2001). Emphasis should be placed on achieving and maintaining a healthy body weight in children as well as adults (Hecker, 1999). This can be done by following a diet based on the avoidance of high-energy foods, as recommended for the prevention of cancer and coronary heart disease, together with carrying out sufficient physical activity (Williams et al, 2002).

Nurses' role includes one-to-one support and interventions regarding nutrition and lifestyle. The primary goal for the client is a 10% reduction in body weight, followed by a further decrease if necessary. The goal for weight loss ranges between 0.25-1kg/week, depending on BMI (National Heart, Lung, and Blood Institute, 1998). It has been demonstrated that a loss of body weight of 10% results in improved control of blood pressure and glucose levels, and reduction of blood triglyceride levels with a parallel increase in HDL (Jones, 2000). There is potential in primary care nursing to help patients manage obesity through evidence-based protocols, such as following a structured programme based on a holistic needs assessment (Brown et al, 2007).

Data from the Framingham study show that a reduction in body weight of 10% is associated with a decrease of 20% in the risk of developing coronary heart disease (Hecker, 2002). Weight loss is associated with substantial decreases in total cholesterol and LDL and, if the weight loss is maintained, in HDL (Hecker, 2002). Weight loss also results in a decrease in arterial pressure, blood glucose levels, proinflammatory cytokines and adhesion molecules, and decreases the risk of developing diabetes, as well as an improvement in endothelium function (Poirier and Eckel, 2002). A decrease in body weight of 10% resulted in substantial positive effects with respect to these factors (Jones, 2000).

Data from the US have revealed that, for 28000 middle-aged women with no other disease or risk factor, a weight loss of 9kg in a year resulted in 25% fewer deaths from all causes, as well as fewer deaths from coronary heart disease in the following 12 years. From the same study, of 15000 women with pathological conditions (hypertension, diabetes, stroke, coronary heart disease), in those who reduced their weight by any degree, overall mortality fell by 20%, mortality from diabetes by 30-40% and death from coronary heart disease by 10%.

In people with hypertension, a decrease in body weight by a mean of 4.7 kg in one year resulted in a decrease in blood pressure of 11mmHg (systolic) and 8mmHg (diastolic). For every kilogram of weight lost, triglyceride levels decreased by 0.015mmol/L and LDL by 0.02mmol/L – in addition to any decrease of LDL due to lower intake of total and saturated fat in the context of an isocaloric diet (Jones, 2000).

Nutritional approaches

Fat intake

The association between fat intake and obesity has been controversial. Although there is much research suggesting that there is an association, there is nearly as much suggesting that there is none (Melanson et al, 2009). Epidemiological and animal studies indicate that fat intake is associated with obesity (National Cholesterol Education Program (NCEP), 2002). Many studies concluded that obesity is more likely to develop in people who follow a high-fat diet in the long term compared to those following a low-fat diet, possibly due to an overconsumption of calories (Perusse and Bouchard, 2000; Shepard et al, 2001). A review of 28 clinical interventions showed that a decrease of 10% in the proportion of energy consumed as fat resulted in a 16g per day decrease in body weight (Perusse and Bouchard, 2000).

There are also studies showing that high fat consumption (>35% of energy intake) may result in metabolic changes leading to a more efficient storage of fat (NCEP, 2002). A

meta-analysis has shown a strong positive association between body fat and the percentage of fat in the diet (Yu-Poth et al, 1999). For every decrease of 1% in the percentage of energy from dietary fat, there is a decrease in body weight of 0.28 kg (Yu-Poth et al, 1999).

However, there have also been studies that have isocalorically replaced carbohydrates with fat, without observing an increase in body weight after a period of several months (NCEP, 2002), but there is no evidence of any long-term effects of such a change. Research into alterations in the ratio of fat to carbohydrate with the same energy intake show that fat intake in itself does not influence total energy intake (Harvey-Berino, 1999; Rolls et al, 1999; Sacks et al, 2009).

Carbohydrates

Guidelines suggest that increasing the proportion of complex carbohdyrates in the diet facilitates a reduction in dietary energy intake and an increase in weight loss (US Department of Health and Human Services/US Department of Agriculture (USDHHS/USDA, 2005; Foreyt et al, 2009; Food Standards Agency (FSA), 2010). Nevertheless, many have proposed low carbohydrate diets in order to facilitate weight loss (Bravata et al, 2003; Foreyt et al, 2009; Nordmann et al, 2006). Low carbohydrate diets, however, may induce ketogenesis, increase LDL levels and harm kidneys (Bravata et al, 2003; Nordmann et al, 2006; Foreyt et al, 2009).

In a cross-over randomized study by Shepard et al (2001), carbohydrate intake was tested in relation to obesity. They concluded that following a high carbohydrate diet could provide some protection in the long term against fat accumulation in subjects of normal weight or above whose physical activity included frequent sedentary days (Shepard et al, 2001). The dietary plans in this study (one high in fat and the other high in carbohydrate) were identical in energy content and the subjects reacted similarly to the alterations in diet composition and to the combination of physical inactivity and diet composition.

There are opposing views in the literature about the role of simple carbohydrates (dietary sugars) in obesity (van Baak and Astrup, 2009), but there is not much evidence that high-sugar diets may result in an increase in body weight (van Baak and Astrup, 2009). If energy intake is stable this kind of diet may lead to an increase in total energy consumption resulting, indirectly, in an increase in body weight (Howard and Rosett, 2002). Increased consumption of refined carbohydrates leads to overconsumption resulting in increased calorie intake and body weight (Hu et al, 2001).

Calories

An increase in fat intake, as well as in animal products and refined foods, has been observed in both developed and developing countries in recent years (Tucker and Buranapin, 2001). Total calorie intake has increased, however, and this has been associated with a dramatic increase in the incidence of obesity and type 2 diabetes; the two main risk factors for cardiovascular disease (Hu et al, 2001). Consumption of high-calorie or 'empty' calorie (or 'energy-dense') foods increases the risk of obesity (World Health Organization (WHO), 2003a; Rolls, 2009).

Studies showed that a positive energy balance leads to an increase in body weight as well as an increase in body fat mass (Buchholz and Schoeller, 2004; Hollis and Mattes, 2005) while a negative energy balance leads to weight loss (Perusse and Bouchard, 2000). The energy density of food may have an important effect on energy intake, independently of macronutrient intake and food palatability (Rolls et al, 1999; Rolls, 2009).

Minor changes in diet may bring about results. For instance, consuming 50 calories less every day, exercising for 15-20 minutes every day or increasing energy expenditure by 100 calories per day, may result in a weight loss of 5kg in a year, or in stabilizing the desired body weight (Krauss et al, 1998). It has also been reported that total calorie intake is more important than fat intake in controlling body weight (Harvey-Berino, 1999; Hu et al, 2001; Foreyt et al, 2009).

Protein

Recent findings suggest that elevated protein intake plays a significant role in maintaining energy balance. This is achieved via three mechanisms: increased satiety related to increased diet-induced thermogenesis; body composition; and decreased energy intake (Halton and Hu, 2004; Westerterp-Plantenga et al, 2009).

In some experiments using meal observation, it was found that, when compared to carbohydrates, proteins increase the sense of fullness as well as thermogenesis, with these effects lasting more than 24 hours (Mikkelsen et al, 2000; Halton and Hu, 2004; Paddon-Jones et al, 2008; Soenen and Westerterp-Plantenga, 2008; Westerterp-Plantenga et al, 2009). In one experiment, three isocaloric intervention diets were tested in 20 young overweight and mildly obese men: a pork diet, a soya diet and a carbohydrate diet (Mikkelsen et al, 2000). Results showed that substituting carbohydrates with 17-18% of energy from protein (whether it is soya or pork) resulted in a 3% increase in energy expenditure for 24 hours, with 2% higher energy expenditure due to animal protein compared to soya protein (Mikkelsen et al, 2000).

It has been reported that a diet plan containing at least 20% protein is more filling, produces a greater thermogenic effect, minimizes loss of muscle mass during weight loss and helps maintain body weight loss, compared to high-carbohydrate or high-fat diet plans (Hecker, 2001).

It must be noted that the above evidence has nothing to do with very high protein and/or very high fat diet plans, including Dr Atkins, that are not balanced in micronutrient content (Hecker, 2001). There is certainly a need for further research and for specific evidence evaluating the long-term effects of this type of diet plan (St. Jeor et al, 2001). The American Heart Association in a relevant review has included specific criteria for the evaluation of such diets (St. Jeor et al, 2001).

Other dietary factors

Various studies have demonstrated that increased intake of dietary fibre, possibly in association with water, increases the sense of fullness (WHO, 2003a; Anderson et al, 2009) and is associated with a decrease in body weight (Rolls et al, 1999; Pereira and Pins, 2000; Anderson et al, 2009). One study showed that psyllium resulted in a decrease in the sense of

hunger of 13% in parallel with a decrease in energy intake of 17% (Pereira and Pins, 2000). In a study on coronary artery risk development in young adults, subjects with higher intakes of dietary fibre (20%), increased their body weight by 8lbs less than subjects with lower intakes of dietary fibre (20%) within 12 years (Pereira and Pins, 2000). Several studies (Summers and Kaminski, 2002; WHO, 2007; James and Lessen, 2009; Papandreou et al, 2010) have concluded that breastfeeding reduces the risk of development of childhood obesity (Summers and Kaminski, 2002; WHO, 2007; James and Lessen, 2009; Papandreou et al, 2010).

The role of diet

Diet quality as well as quality of nutrition—both in terms of food groups and foods within each food group—are associated with BMI and obesity (Nicklas et al, 2001; Halkjaer et al, 2009; Romaguera et al, 2009; Kontogianni et al, 2010). For instance, the diet behaviour of 514 healthy women in Hawai revealed four distinct patterns: 'meat diet'—a western-type diet; 'vegetable diet', 'pulses diet'—healthy dietary habits—and 'cold food diet'. The study demonstrated a positive association between BMI and 'meat diet', whereas the other three patterns were inversely associated with BMI. These results show that food choice is important for body weight control. The emphasis should, therefore, be given to dietary patterns rather than specific nutrients (Maskarinec et al, 2000). A similar study was conducted by Fung et al, aiming to test the effect of two distinct dietary patterns—the 'western type diet' and 'the prudent diet'—on biological indices of obesity and cardiovascular disease. Results showed that the latter dietary pattern was associated with a more favourable indices profile (Fung et al, 2001).

In addition to the above, dietary behaviours are associated with obesity and BMI (Nicklas et al, 2001, WHO, 2003a). Increased meal sizes are associated with increased energy intake in adults and children (Nicklas et al, 2001, WHO, 2003b; Berg et al, 2009). One study has shown that adults consumed a larger quantity of food when they were offered a bigger than usual portion (Nicklas et al, 2001). In an intervention study of preschool children (3.6 years old) providing a meal of macaroni and cheese, it was observed that the children consumed the same amount regardless of the meal size offered (Rolls et al, 2000). However, older children (5 years old) consumed more energy when they were presented with larger portions (Rolls et al, 2000). The conclusion drawn from these studies is that human beings are characterized by an innate ability to consume exactly the amount of energy needed.

Different studies have noted an association between the frequency of fast-food consumption, total energy intake and body weight in teenagers and adults (Nicklas et al, 2001; Ebbeling et al, 2002,;WHO, 2003b). Consumption of soft drinks has also been positively associated with an increased energy intake and is presumed to be one of the dietary factors responsible for the development of childhood obesity (Nicklas et al, 2001; WHO, 2003b; Bray, 2010). Irregular meal intake has been associated with obesity (Berg et al, 2009), and teenagers who followed a regular meal pattern were leaner than those who did not (Nicklas et al, 2001; Kontogianni et al, 2010).

Obesity in children

Evidence from the US has indicated that the incidence of childhood obesity increased up to four-fold in 20 years (Williams et al, 2002). In British children, the prevalence of obesity is reported to have increased from 1.5% in 1984 to 6.3% in 2003 (Stamatakis et al, 2005), while 16.8% of boys and 15.2% of girls aged 2 to 15 were classified as obese in 2008 (NHS, 2010).

These statistics are alarming because the risk of becoming obese adults is 1.5 to 2 times greater in overweight children (Guillaume, 1999; Nicklas et al, 2001). It is estimated that 50% of obese children will become obese adults (Krauss et al, 1998). Obese children often present with a cluster of risk factors, and children coming from families with a history of cardiovascular disease have larger body weights than those with no such family history (Krauss et al, 1998). High body weight during childhood and adolescence has been associated with increased risk for hypertension, dyslipidemia, type 2 diabetes – which is almost exclusively due to childhood obesity (Ebbeling et al, 2002), early atherosclerosis and adult obesity, as well as increased mortality and diseases associated with adult obesity (Williams et al, 2002; Steinberger and Daniels, 2003). Obese adolescents have also been found to have high LDL and triglyceride levels and low HDL levels (Steinberger and Daniels, 2003).

More than 60% of overweight children present with at least one additional cardiovascular risk factor, and 20% with two or more risk factors (WHO, 2003a). Likewise, one study of 813 overweight children found that 58% presented with at least one cardiovascular risk factor, and 50% with two or more (Raman, 2002). Overweight young people are 2.4 times more likely to develop high cholesterol levels and 43.5 times more likely to present with three cardiovascular risk factors (Nicklas et al, 2001).

The consequences of obesity to the developing human cardiac system are still not fully understood (National Institutes of Health (NIH), 2002). Data from a small number of studies on childhood obesity and cardiovascular disease in adults have shown that obese children are characterized by increased morbidity and mortality from coronary heart disease and cardiovascular disease in their adult years (Gunnell et al, 1998; Krauss et al, 1998). A British study showed that in overweight children the risk of an ischaemic episode during adulthood was doubled after 57 years (Ebbeling et al, 2002). Data from 1165 boys and 1234 girls aged 2-14 years have shown an increase in cardiovascular mortality in adulthood in those with higher BMI (Gunnell et al, 1998).

Evidence showed that accumulation of abdominal fat begins at childhood (Goran and Gower, 1999), and that, in children and adolescents, distribution of body fat is more strongly associated with cardiovascular risk factors than whole-body fat (Daniels et al, 1999). Abdominal fat in children and adolescents is associated with more disadvantageous concentrations of blood lipids and lipoproteins and higher blood pressure (Daniels et al, 1999). In obese adolescents a positive association has also been found between abdominal fat and insulin resistance (Goran and Gower, 1999).

In adolescents and young people, obesity may accelerate the process of atherosclerosis, years before the individual has any clinical symptoms. This justifies the assessment of childhood obesity with a view to preventing future cardiovascular disease (Singh et al, 2008). In 3000 autopsies of people aged 15-34 years, the incidence of obesity (BMI >30kg/m^2) was 14.3% and had been the leading factor in atherosclerosis (Poirier and Eckel, 2002). Obesity in young people has been associated with lipid streaks and raised defects in the right coronary artery, as well as with microscopic atherosclerotic stenosis in the left anterior descending artery (Poirier and Eckel, 2002).

During childhood two periods are considered to be critical for the development of obesity: between four and six years and during adolescence (Stettler et al, 2000). The long-term consequences of obesity evolving from childhood to adulthood necessitate interventions during childhood to prevent obesity (Burke et al, 2008). In children, the primary emphasis should be on the prevention of weight gain and the maintenance of normal developmental patterns; weight loss should be recommended only in those presenting with comorbidities such as diabetes and hypertension (Gidding et al, 1996).

Intervention may be required as early as conception, in view of the association of obesity in children with obesity in pregnancy. During pregnancy, obesity results in an increase of nutrient transport through the placenta and may induce permanent alterations in appetite, in neuroendocrinological function and in energy metabolism (Ebbeling et al, 2002). Children who are fed with formula milks also have a higher risk of developing obesity compared to children who are breast-fed (Ebbeling et al, 2002).

Nurses and health promotion

Nurses can promote healthy lifestyle patterns that reduce the risks of being overweight or obese. For example, breast-feeding, physical activity, regular meals, and nutrition and weight counselling are all areas where nurses may help to reduce the risk of obesity (ICN, 2009).

In the US, many nurses provide weight-related health information to the public (Miller et al, 2008). Community and school nurses may use research evidence in designing health promotion for different populations (Walker-Sterling, 2005). Across the US, school nurses are encouraged to follow a childhood obesity education programme (National Association of School Nurses, 2010). In Pennsylvania, school nurses, in collaboration with a multidisciplinary team, are involved in screening programmes and support for children who are underweight or at risk of being overweight or obese (Sheehan and Yin, 2006). A school intervention programme in Massachusetts promotes eating five portions of fruit and vegetables, a maximum of 2 hours' television time and at least 1 hour of physical activity each day (Sheehan and Yin, 2006). In the UK, in a prospective, evidence-based programme in seven regions, primary care nurses delivered interventions to 1906 patients with BMI >40kg/m² or >28kg/m² with obesity-related comorbidities. The evaluation suggested that nurses can achieve and maintain clinically beneficial patient weight loss (Counterweight Project Team, 2008).

The majority of nurses have a positive attitude towards providing nutritional support (Christensson et al, 2003). However, eating habits and obesity may be ignored, if nurses are under pressure of time. Brown et al (2007) studied the patterns of clinical practice, beliefs and attitudes of primary care nurses in regards to obesity management and they reported that only practice nurses reported substantial clinical activity in obesity management. Other nurses and health visitors reported much less activity, although they believed obesity to be an important health issue and its management an appropriate part of their role. In a position statement on obesity, the ICN highlights the strategic role that nurses and national nursing organizations can play in promoting a positive lifestyle, including weight maintenance and nutrition education (Sheehan and Yin, 2006).

The use of comprehensive nutritional assessment tools, especially by school nurses, is a significant measure in early obesity detection and prevention (Grive and Finnie, 2002). Use of a national growth chart or an internationally accepted chart on the basis of BMI for age and gender percentiles improves the nutritional and weight assessment of children (Grive and Finnie, 2002). Nurses may also be in a position to address practical matters, such as the availability of school and work canteens and the choice of food offered, or to consider the psychosocial and cultural dynamics that affect health behaviours that lead to obesity.

Regardless of the aetiology of a patient's obesity, nurses need to have an understanding of the patient's multiple needs and to collaborate with other members of the health team to discuss personalized holistic care issues. The team may act as a resource in considering the best practice for each client and for the nurses who care for them (Camden, 2009).

Berry et al (2004) evaluated the evidence related to family-based interventions. They noted that behavioural modification interventions that targeted children and parents together or separately were reported to be successful in improving weight-loss outcomes in both parents and children. Problem-

solving interventions targeting parents showed improved weight outcomes for their children. However, when this approach was used with parents and children together or children alone, there was no improvement.

Nurses across the UK are involved in a range of innovative projects designed to help people in losing weight – for example the 'pounds for pounds' programme at Kent (Lomas, 2009), which focuses on long-term weight control and financially rewards weight loss through a balanced diet and lifestyle, in line with 2006 NICE guidelines on obesity.

Recommendations for nurses (Berkowitz and Borchard, 2009) in relation to childhood obesity include:

- Advocating for the promotion of increased physical activity at governmental level
- Supporting efforts to preserve and enhance parks, to develop walking and bicycle paths, and to promote the use of physical activity opportunities by families.
- Engaging families with parental obesity in prevention activities
- Encouraging parenting styles that support increased physical activity and reduce sedentary behaviours
- Encouraging parental modelling of healthy dietary choices.

Prevention, early detection and the appropriate treatment of obesity are of great importance in nursing practice in all settings and should not be undervalued. Nurses can and should participate in health promotion and education (Sheehan and Yin, 2006) for the prevention of obesity. Nurses can promote appropriate nutrition advice not only to the general public, but most importantly to policy-makers.

Conclusion

Dietary factors that relate to obesity are complex and still not fully understood. Contrary to the common perception, fat intake per se does not influence total energy intake – overconsumption of calories is the most important factor. Increased portions, irregular meals and soft drinks are positively associated with high energy consumption. Preventive programmes should emphasize adherence to prudent dietary patterns rather than to intake of specific nutrients. Nurses constitute a political force in health policy, because they are situated in a wide range of settings (Sheehan and Yin, 2006). Thus, nurses are on the frontline of obesity prevention and health promotion. BJN

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KEY POINTS

- The aetiology of obesity is multifactorial, and dietary factors that relate or are responsible for the development of obesity are complex and still not fully understood.
- Obesity is more likely to develop in people who follow a long-term high fat diet, as compared to people who follow a low fat diet, possibly due to an increased possibility of overconsumption of calories.
- Small changes may bring about results: consuming 50 calories less every day, exercising for 15-20 minutes every day or increasing energy expenditure by 100 calories per day may result in a weight loss of 5 kg in a year .
- Proteins, as compared to carbohydrates, increase the sense of fullness as well as thermogenesis, with these effects lasting more than 24 hours.
- Dietary fibre, possibly in collaboration with water, increases the sense of fullness and is associated with decrease in body weight.
- Breastfeeding reduces the risk of development of childhood obesity.
- Increased meal sizes, irregular meal intake, consumption of soft drinks are positively associated with increased energy intake.
- Prudent dietary patterns are inversely associated with BMI and emphasis should be given to dietary patterns rather than intake of specific nutrients.