

Nutrition and Diet Research Progress Series

Nutritional Education



Ida R. Laidyth
Editor

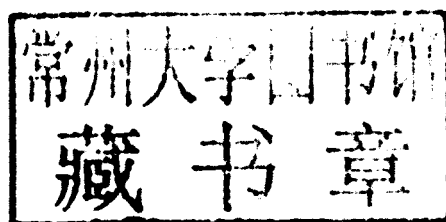
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NUTRITION AND DIET RESEARCH PROGRESS SERIES

NUTRITIONAL EDUCATION

IDA R. LAIDYTH

EDITOR



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PREFACE

Nutritional education programs have been implemented in the workplace and in schools in an effort to improve diet and lifestyle, and therefore, reduce the incidence of many chronic diseases linked to overweight and obesity including; diabetes, cardiovascular disease and cancer. Providing age-appropriate, culturally sensitive instruction and materials were connected to the success of nutritional education programs. This new and important book gathers the latest research from around the globe in the study of nutritional education and highlights such topics as: nutrition education in the workplace, metabolic syndrome in children, school feeding programs, maternal nutritional education during pregnancy, nutrition and tuberculosis, nutrition education in school-based childhood and adolescent programs, and others.

Chapter 1 - Reviews of the existing evidence have demonstrated the effectiveness of lifestyle interventions in producing a modest total weight loss amongst overweight and obese adults. However, there is a dearth of research to explore the experiences of these individuals, or to obtain their views on the feasibility and acceptability of the educational messages delivered. This chapter seeks to add to the qualitative evidence base regarding the perceptions of adults who receive nutritional education as part of treatment for overweight and obesity. The authors have drawn together the findings from two qualitative studies conducted in the North East of England to explore the lived experience of individuals participating in non-commercial weight loss programmes. The programmes in question were delivered in primary care or community settings and targeted adults from socio-economically disadvantaged backgrounds. A number of barriers and facilitators to implementing the lessons learned have been identified and considered in light of the existing theoretical and empirical literature. The chapter concludes with a discussion of the implications of these findings for policy, practice and future research.

Chapter 2- Nutrition education programs have been implemented in the workplace in an effort to improve the diet and lifestyle of employees and, therefore, reduce the incidence of many chronic diseases linked to overweight and obesity including, diabetes, cardiovascular disease and cancer. Despite the importance of this outcome, the success of these programs has varied. This chapter uses a qualitative, narrative approach to review research conducted over the past 10 years on nutrition programs in the workplace and attempts to identify those aspects associated with successful behaviour change among employees. This approach enables us to include a variety of methods of intervention and data collection and thereby

allows identification of promising intervention approaches that might not be identified in review approaches that are based on quantitative meta-analyses.

The chapter reviews the evidence for both the efficacy and the effectiveness of nutrition education programs in the workplace (i.e., whether an intervention works under ideal, well controlled conditions, versus whether the intervention works in the “uncontrolled” real-world workplace) (Spraycar, 1995). In addition, the characteristics of efficacious and effective programs are described including the duration of the nutrition education programs, the type of programs offered to employees, and the settings in which the programs were implemented. The results of the review suggest the workplace is a viable context for delivery of programs designed to change food intake behaviours, and overweight and obesity prevalence, although the challenge is to achieve sustained change on these outcomes after the intervention concludes. The results of this review should be taken into account when planning future work-based education programs on nutrition.

Chapter 3- The purpose of this chapter was to review nutrition education in school-based childhood and adolescent obesity prevention programs. Problems of overweight and obesity have reached epidemic proportions in children and adolescents. With the large number of children and adolescents affected by overweight and obesity, it has been recognized as a critical public health threat, and prevention should become a priority. Schools have been considered an important venue for the delivery of health education programs since a majority of the nation’s youth can be reached. Implementing a program in the school does not necessarily correspond to success, and therefore common components among successful nutrition education programs were examined. Providing age-appropriate, culturally sensitive instruction and materials were connected to the success of the programs. Success was also found when the nutrition education program was relevant to the student, and information was applicable to their everyday life. It was also critical to go beyond dissemination of knowledge and develop attitudes, skills, and behaviors to adopt, maintain, and enjoy healthy nutrition habits. Finally, recommendations were made to enhance the effectiveness of future school-based nutrition education programs.

Chapter 4- Nutrition plays both an ongoing and fluctuating environmental role influencing gene expression and observed phenotypic variation of complex traits, such as the serum lipid transport system. Individual nutritional status is influenced by a mélange of multiple cultural, biological, generational, epigenetic and genetic factors, all of which can ultimately affect the genetic profiles of a population. Despite increasing awareness of sex-specific effects, few research studies address the mechanisms by which factors of sexual dimorphism may influence the relationship between nutrients and genes in trait expression. Not all differences can be solely attributed to the direct effect of sex hormones. The effects of body composition, metabolically active adipose tissue and its active adipokines, macronutrient energy preference and metabolism are among the potential underlying factors affecting normal sex-specific expression of nutrient-by-gene interaction on complex traits. This chapter explores the mechanisms through which both direct and indirect effects of steroid hormones may influence biomarkers of lipid metabolism. Given the emphasis on dietary manipulation of serum lipids as a primary strategy in prevention of cardiovascular disease (CVD), further research addressing aspects of sexual dimorphism underlying variation of the lipid profile is imperative. We examine current literature addressing the effects of nutrition and sexual dimorphism in body composition, fat patterning and hormones, energy homeostasis and metabolism and their association with serum lipids. Studies of dietary

strategies as the first line of defense against susceptibility to disease have often concentrated on male subjects, with little understanding of female variation, and therefore having inconsistent results when applied to females.

Chapter 5- The obesity epidemic in the United States and the continuing rise in the number of children and adolescents who are overweight and have type 2 diabetes mellitus[1], as well as reports by life-course epidemiologists [2] who identify that poor health in childhood can lead to acute and chronic illness in adulthood, provide evidence that the presence of metabolic syndrome in children and adolescents is a risk factor for developing cardiovascular disease and type 2 diabetes[3]. The purpose of this paper is threefold: (1) To review the risk factors for developing metabolic syndrome in children and adolescents; (2) to report on the projected long-term health effects of metabolic syndrome; and (3) to describe health and wellness programs that have been implemented to address the rise in overweight children and adolescents at risk for metabolic syndrome, cardiovascular disease, and type 2 diabetes mellitus.

Chapter 6- The paper reviews methods for enhancing learning at tertiary level by using information technology, including published examples relevant to nutrition education of adults in other contexts. Teaching may include animations that enhance understanding and personal response systems that provide immediate feedback about student comprehension. Tutorials, practical classes and self-study materials can incorporate a wide range of computer programs. These have been used for many years to permit students to analyse their own diets, which is known to provide useful feedback to enable changes to be made. Students learn from exercises in which they have to improve diets and they can become more familiar with food composition using computer-generated bar charts in a quiz format. Programs can integrate energy expenditure with different levels of activity to energy intake with different diets. Students may learn how vitamins are involved in metabolism by exploring pathways using an interactive program. Student research projects can be enhanced by using a program that helps them write a protocol and the output of statistical programs can be interpreted by a program that reads the screen and explains what it means. Computers can be used as vehicles for simulations of practical situations such as client interviews and they can provide discussion forums for students on placement. Whilst revising before assessments, students may benefit from a variety of testing programs; for example crossword puzzles test their knowledge in an enjoyable way and construction of sentences using words from a list tests their understanding of concepts.

Chapter 7- School Feeding Programs have been established in most parts of the world with the goals of reducing hunger and malnutrition. School Feeding Programmes have potential to safeguard the health and the well-being of school children, and also promote good dietary, hygiene, and sanitation practices. School children grow up knowing the consumption of nutritious commodities and other foods. School Feeding Programs have been used as a means to distribute food to the pre-school and school-age children, as a food security net to improve their nutrition status, and also improve the general socio-economic conditions of rural communities as well as providing educational and nutritional benefits of participants. Nutrition status is a powerful determinant of educational health and developmental outcomes of school children. Nutrition status affects physical growth and maturation, and influences a person's attention span, learning capacity and ability to engage in educational experience. Undernutrition in early childhood has potential to negatively influence school aptitudes, time of school enrollment, school attendance and concentration. Schools provide an ideal channel

for nutrition programs and services especially now that they reach many children. Acceptable dietary, hygiene and sanitation habits can be developed amongst school children in school. Most children from resource-poor households are often absent from schools as they provide child labor on farms and households to augment their families much needed income for food purchases. The development of health-promoting schools has promising returns for school children in developing countries. This study demonstrates the interaction of poverty, nutrition status and education. To improve the nutritional status and school attendance of the pupils whose parents cannot afford to participate in the School Lunch Programs, funding from external sources is essential. Efforts should be directed toward reducing hunger in the classroom and improving the nutritional status of pupils in schools. Inclusion of School Feeding Programs as a policy issue in national goals and objectives could result in improved nutritional status among school children.

Chapter 8- Maternal nutritional status before and during pregnancy constitutes one of the most important determinants for fetal growth. In adequate body weight before conception and low maternal weight gain are associated with adverse perinatal outcomes. The fetal origins hypothesis proposes that inadequate maternal nutrition and a low infant birth weight can predispose the child to diseases such as, diabetes and cardiovascular disease later in life. Pregnancy can be an opportune time to improve nutrition, and presents an ideal time for health promotion activities. However, many women of childbearing age do not maintain good nutritional status before and during pregnancy. They do not have an opportunity to get adequate and appropriate nutrition education in antenatal care. Most of them expect advice on general dietary improvements, with the remainder seeking advice on helping to promote their quality and quantity of nutritional intake. All women of reproductive age should be encouraged to follow the Government recommendation and eat a well-balanced diet. Health care providers need to ensure pregnant women know the positive and negative effect of poor maternal nutrition status, including the need for additional folate, at each physical check-up. An individualized approach is likely to have better outcomes than a standard intervention that is given to all pregnant women. A critical goal to achieve is for women to make behavior changes for good nutritional status before, during, and beyond pregnancy, which may lead to improved birth outcomes.

Chapter 9- Evidences are accumulating in both human and animal studies that undernutrition is associated with increased risk and severity of tuberculosis. In addition, obesity appears to protect against tuberculosis. Diabetes mellitus increases risk of tuberculosis, but poor diabetic control contributes to the bulk of such risk. In both undernutrition and poor diabetic control, the increased risk is seen mainly in the pulmonary form of the disease, and the exact reason for relative sparing of the extrapulmonary sites remains unclear. Undernutrition has also been associated with worsened prognosis, poorer response to treatment and increased risk of relapse. Data from randomized controlled trials are scanty, as nutritional supplementation trials are often costly and difficult to implement. Micronutrients have been shown to decrease the risk of reversion of sputum culture to positivity after initial conversion, but there was no significant effect on mortality. With the putative roles of systemic inflammatory responses in tuberculosis manifestations, adjunctive corticosteroid administration treatment has been found to afford earlier and more significant body weight gain, albeit no differences in sputum bacteriological conversion and disease relapse rate. Further studies, with better study designs and serial monitoring of relevant nutritional parameters, are required to clarify the complex situation.

Chapter 10- Evidences are accumulating in both human and animal studies that undernutrition is associated with increased risk and severity of tuberculosis. In addition, obesity appears to protect against tuberculosis. Diabetes mellitus increases risk of tuberculosis, but poor diabetic control contributes to the bulk of such risk. In both undernutrition and poor diabetic control, the increased risk is seen mainly in the pulmonary form of the disease, and the exact reason for relative sparing of the extrapulmonary sites remains unclear. Undernutrition has also been associated with worsened prognosis, poorer response to treatment and increased risk of relapse. Data from randomized controlled trials are scanty, as nutritional supplementation trials are often costly and difficult to implement. Micronutrients have been shown to decrease the risk of reversion of sputum culture to positivity after initial conversion, but there was no significant effect on mortality. With the putative roles of systemic inflammatory responses in tuberculosis manifestations, adjunctive corticosteroid administration treatment has been found to afford earlier and more significant body weight gain, albeit no differences in sputum bacteriological conversion and disease relapse rate. Further studies, with better study designs and serial monitoring of relevant nutritional parameters, are required to clarify the complex situation.

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Chapter 1

EXPLORING THE VIEWS AND EXPERIENCES OF PARTICIPANTS IN STRUCTURED WEIGHT LOSS PROGRAMMES

S. Visram¹ and A. Crosland²

¹ Postgraduate Research Associate (BA Hons, MA Oxon, MPH), Community, Health and Education Studies (CHESs) Research Centre, Northumbria University, Newcastle-upon-Tyne, England.

² Professor of Nursing (RGN, MA, PhD), Faculty of Applied Sciences, University of Sunderland, Sunderland, England.

ABSTRACT

Reviews of the existing evidence have demonstrated the effectiveness of lifestyle interventions in producing a modest total weight loss amongst overweight and obese adults. However, there is a dearth of research to explore the experiences of these individuals, or to obtain their views on the feasibility and acceptability of the educational messages delivered. This chapter seeks to add to the qualitative evidence base regarding the perceptions of adults who receive nutritional education as part of treatment for overweight and obesity. The authors have drawn together the findings from two qualitative studies conducted in the North East of England to explore the lived experience of individuals participating in non-commercial weight loss programmes. The programmes in question were delivered in primary care or community settings and targeted adults from socio-economically disadvantaged backgrounds. A number of barriers and facilitators to implementing the lessons learned have been identified and considered in light of the existing theoretical and empirical literature. The chapter concludes with a discussion of the implications of these findings for policy, practice and future research.

INTRODUCTION

Obesity is widely considered to be one of the greatest global public health challenges of the 21st century, with more than one billion adults overweight and at least 300 million clinically obese (WHO, 2004). Although the mechanism of obesity development is not fully understood, it is known that the condition occurs when energy intake exceeds energy expenditure, and that environmental factors, cultural practices and lifestyle preferences all play a major role in its rising prevalence worldwide (Institute of Nutrition Metabolism and Diabetes, 2003). Obesity has overtaken smoking to become the number one public health issue in England, with 24 million adults – more than half of the country's adult population – considered to exceed the healthy weight for their height (Joint Health Surveys Unit, 2004). Since the 1980s the number of adults in England classified as clinically obese has more than doubled, with 24 per cent of men and women over 16 years of age falling into this category (The Health and Social Care Information Centre, 2009). Figure 1 provides an illustration of the most recent national statistics on adult overweight and obesity, and also demonstrates the trends over time for men and women. Levels of adult obesity across Europe and the USA are expected to increase further as a result of the rising prevalence of childhood obesity in recent decades (Troiano & Flegel, 1998). Around 80 per cent of obese children and adolescents go on to become obese adults, adding to the burden of excess weight amongst adults which has reached epidemic proportions on a global scale (Whitaker et al., 1997; WHO, 2004).

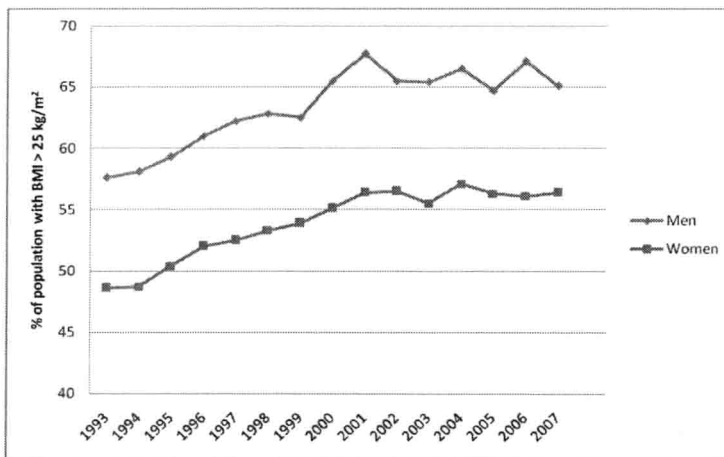


Figure 1. Trends in Adult Overweight and Obesity in England (1993 – 2007)

In the clinical environment, obesity tends to be measured using techniques such as waist circumference, skin fold thickness and body mass index (BMI), which is defined as body weight in kilograms divided by the square of height in metres (kg/m^2) (Kopelman, 2000). A person with a BMI between 25 and 30 kg/m^2 is classed as being overweight and a person with a BMI over 30 kg/m^2 is considered to be clinically obese (WHO, 2000). This measure allows meaningful comparisons of weight status within and between populations and the identification of individuals and groups at risk of morbidity and mortality. However, BMI fails to distinguish between fat and fat-free mass (muscle and bone) and therefore cannot take body shape or fat distribution into account. Epidemiological and metabolic studies have

shown that the complications of obesity are more closely related to the distribution of excess fat rather than overall excess weight (Despres et al., 2001). Around a third of men and women in England have an elevated waist to hip ratio, which indicates abdominal obesity and is a major risk factor for diabetes, cardiovascular disease and mortality (Joint Health Surveys Unit, 2004). There are also significant age and ethnic group differences in the accumulation of visceral adipose tissue, as well as confounding factors relating to the risk of coronary heart disease for women as opposed to men (Lean et al., 1995; Lemieux et al., 1996a; 1996b). There is evidence to suggest that the risk of overweight and obesity increases with rising social deprivation; for example, obesity is known to be more common in adults employed in manual occupations, particularly women (Reilly, Wilson, Summerbell, & Wilson, 2002). In England, one-third of women in semi-routine and routine occupations have a BMI of more than 30 kg/m², compared to around one-fifth of those employed in managerial and professional roles (Joint Health Surveys Unit, 2004).

Public health concerns about obesity relate to its link to numerous chronic diseases, many of which are life limiting. An estimated 9,000 premature deaths per year in England can be attributed to obesity (6 per cent of all deaths) and the lifespan of a morbidly obese adult is up to 10 years less than that of someone of lower weight, which is comparable with the effects of smoking (National Audit Office, 2001; Prospective Studies Collaboration, 2009). Being obese doubles a person's risk of all-cause mortality, coronary heart disease, stroke and type 2 diabetes, and increases their risk of some cancers, musculoskeletal problems, and loss of function (National Audit Office, 2001; National Heart Lung and Blood Institute, 1998). Figure 2 below highlights a number of the potential immediate and intermediate consequences of excess weight in adults (adapted from DWP, 2008). In addition to the physical effects, obesity has considerable social and psychological consequences, such as anxiety, depression and mood disorders, as well as financial implications (Becker et al., 2001). It has been estimated that around £3.2 billion of direct costs to the National Health Service in England could be avoided each year if the population were at a healthy weight (Allender & Rayner, 2007). Recent estimates state that the cost of treatment for diseases brought on by obesity in adults is currently £1 billion, the cost of sickness absence or loss of production directly attributable to obesity is £1.4 billion, and the cost in terms of state benefits is between £1 billion and £6 billion (Health Select Committee, 2004). Obesity is now a major contributor to the global burden of chronic disease and disability, accounting for 2 to 8 per cent of health costs and 10 to 13 per cent of deaths across the European region (WHO, 2004).

A number of recent policy documents have reinforced the urgency attached to addressing the issue of overweight and obesity. It was one of the six overarching priorities in the UK government's public health White Paper, 'Choosing Health: making healthy choices easier', which drew together a series of other initiatives such as the National Service Frameworks on Coronary Heart Disease and Diabetes, and the National Cancer Plan (Department of Health, 2004). 'Choosing Health' highlighted the need for fundamental changes to both individual lifestyles and the environment if the current obesity trend is to be halted. This was reinforced by the Foresight project, which aimed to take a strategic view of obesity in the UK and devise a sustainable, long-term response (Butland et al., 2007). It was estimated that, by 2050, the financial impact to society attributable to obesity could become an additional £45.5 billion per year. The key message of the Foresight project was that policies aimed solely at individuals will be inadequate to reverse this trend. Instead, significant effective action to prevent obesity

is required at multiple levels – individual, family, community and population. In 2006, the National Institute for Health and Clinical Excellence (NICE) published the first national guidance on the prevention, identification, assessment and management of overweight and obesity in England and Wales (NICE, 2006). The guidance supports the implementation of the ‘Choosing Health’ White Paper and existing National Service Frameworks, and contains evidence-based recommendations for the management and prevention of overweight and obesity in both NHS and non-NHS settings. NICE has also published guidance on behaviour change, which highlights key concepts from the psychological literature that might be used to structure and inform interventions to tackle obesity (NICE, 2007). This guidance highlights the importance of being clear about the behaviours that the intervention is intending to change, the contextual changes that need to be made, and also whether the intention is to change the behaviour of individuals, communities or the wider population.

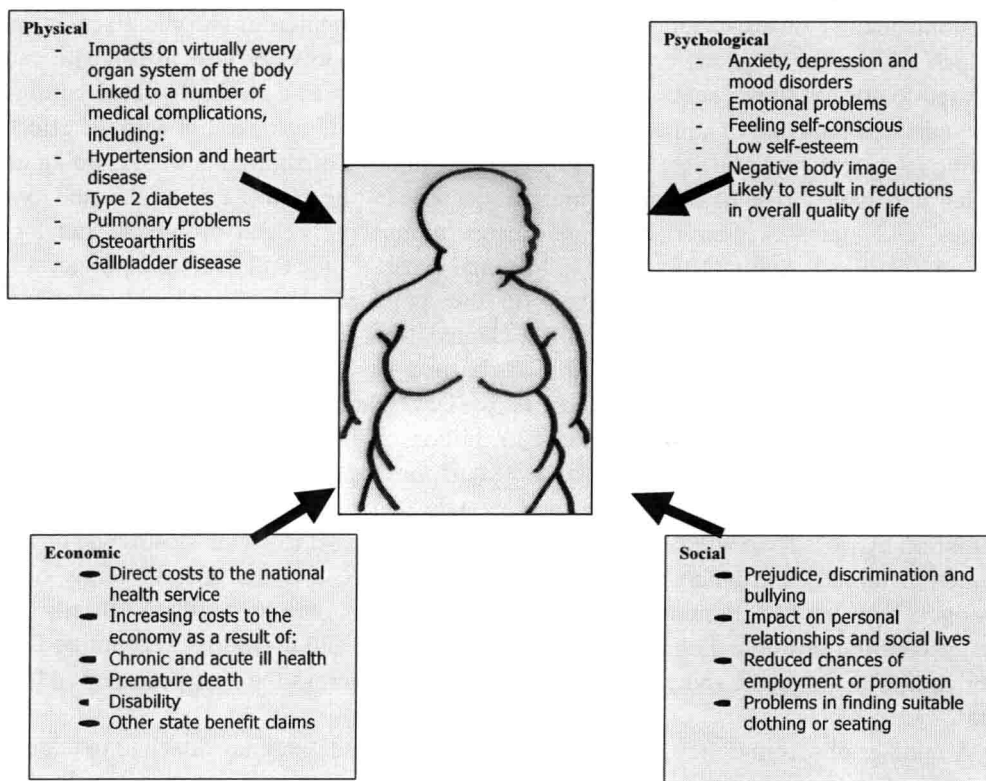


Figure 2. Consequences of Excess Weight in Adults

In spite of the policy rhetoric, most approaches to tackling obesity have focused on attempts to change the diet and exercise behaviour of individuals, rather than taking a community or population-based approach. For the treatment of obesity in adults, the aim is generally to use diet, physical activity and behavioural strategies, in combination where possible. Systematic reviews of the existing evidence have demonstrated the effectiveness of various lifestyle interventions in producing a modest total weight loss amongst adult participants (Astrup et al., 2000; Effective Health Care, 1997; Mulvihill & Quigley, 2003;

NHS Centre for Reviews and Dissemination, 1997; Pirozzo et al., 2002). However, the overall success of non-surgical approaches has been disappointing, leading some experts to conclude that treatment of obesity, which aims to establish normal bodyweight, is unrealistically optimistic (Ebbeling et al., 2002). Most interventions are marked by small changes in relative adiposity followed by substantial relapse, with some 70 per cent of successful individuals regaining at least half of the weight lost within two years (Heffernan, 2003). One explanation for this lack of success is that the dietary and physical activity prescriptions used in the majority of programmes are not particularly efficacious. Most interventions focus on reduction of fat intake, even though dietary fat might not be an important cause of obesity, and use conventional programmed exercise prescriptions, even though increasing lifestyle activity or reducing sedentary behaviours might be better for long-term weight control (Epstein et al., 1994). A second potential explanation is that adverse environmental factors overwhelm the behavioural and educational techniques designed to reduce energy intake and increase activity levels (Ebbeling et al., 2002). The term 'passive obesity' has been coined to describe the way in which the average person is likely to gain weight simply by living an ordinary life in contemporary society, as a result of the available technology, transport and food choices (Butland et al., 2007). The challenge is therefore to identify obesogenic environments and influence them so that healthier choices are more available, easier to access, and widely promoted to the whole population.

As well as gaps in the evidence base regarding the long-term effectiveness of interventions, there is a dearth of research to explore service users' views and experiences of weight management. Whilst interventions may be well intentioned, strategies for weight loss often ignore the actual causes of weight gain and the factors prompting people to attempt to control their diet. Conventional dietary studies may yield information on nutrient intake and food choice, but the benefit to public health has been limited since this knowledge is divorced from the social context of its application (Germov & Williams, 1996). Studying weight-related issues in context requires the use of qualitative research methods from a sociological perspective, an approach which has generally been neglected due to the grounding of nutrition research in the positivistic paradigm. Qualitative approaches have previously been used to explore views on becoming and being obese (Barker & Cooke, 1992; Douglas et al., 2008; Grant & Boersma, 2005; Thomas et al., 2008), experiences of stigmatisation (Cossrow et al., 2001; Rogge et al., 2004), weight loss attempts (Adolfsson et al., 2002; Bidgood & Buckroyd, 2005; Cioffi, 2002a; Jones et al., 2007), and accounts of successful weight loss and maintenance or relapse (Byrne, 2002; Byrne et al., 2003; Roberts & Ashley, 1999; Sarlio-Lahteenkorva, 1998, 2000). However, these studies remain relatively rare considering the growing interest in obesity and the increasing recognition that lay people are 'experts' in their own lives (Popay & Williams, 1996; Sarlio-Lahteenkorva, 2000). Overweight and obese people are likely to have valuable insights into weight-related issues, which may be used to enhance the effectiveness, acceptability and equity of service provision. The research described in this chapter is an attempt to increase our knowledge about people's lived experiences of obesity treatment and how the lessons learned impact upon their lives.

