

## Introduction

In 2006, Sydney University Press and Sydney University Research Portfolio began a collaboration to produce a series of books containing multidisciplinary perspectives on issues of global importance. Because diabetes, obesity and their related diseases place a high burden on individuals, the community and the healthcare system, this topic was an obvious choice for the second book in this series. In this book, researchers and clinicians from the University of Sydney and beyond have joined forces to tackle this major health challenge.

Type 2 diabetes and obesity share common risk factors, including insufficient physical activity, and the over-consumption of energy-dense, nutrient poor foods. Obese individuals are at an increased risk of developing chronic health problems including cardiovascular disease and type 2 diabetes. These diseases are not just problems for the individual, but create psychological and relational problems within families, reflect environmental problems within communities, and ultimately carry economic consequences for entire nations. The solutions, therefore, need to be equally wide-ranging, and accessible to all.

As well as affecting the adult population, obesity and diabetes are increasingly seen in childhood and adolescence. Obesity is associated with a range of psychosocial problems such as depression and low self-esteem, and discrimination. Often an individual does not perceive their weight accurately and tends to either over- or underestimate it. However the solutions to the diabetes and obesity epidemic require more than just changes in the perceptions and behaviours of individuals. Obesity and diabetes are environmental health problems and effective solutions will require policies that target the entire population, regardless of their current health status. Cultural differences, food production and supply, urban design and transportation are important factors to consider. In addition, new kinds of interventions will be needed in key settings including schools, workplaces, primary healthcare, pharmacies and hospitals.

Acknowledging this, the authors write about risks, causes and consequences, as well as prevention and treatment: how to identify and mitigate the risk factors, deliver targeted and effective healthcare, and formulate national and global strategies to ultimately turn the tide on some of the 21st-century's most devastating diseases. Contributors to this book are necessarily diverse and include endocrinologists, pharmacists, haematologists, biologists, paediatricians, psychologists, health policy experts, lawyers, nutritional scientists, nurses, health promotion experts, exercise and sports scientists, and dietitians. By drawing from a range of specialties these authors present new insights and hope to present a more holistic understanding of the challenges faced by individuals and societies.

This book brings together new research in obesity and diabetes from a range of perspectives. Drawing from the fields of medicine, the biological sciences, health science, business,

law, social sciences, pharmacy, education and nursing, the authors first define the nature and scale of the obesity and diabetes crisis, and then explore possible solutions. In the first section, researchers explore the problems of obesity and diabetes at the cellular or physiological level. The issues that these conditions raise are not the same for everyone. Hence, in the second section, the authors turn to specific risk groups and settings. The third section considers options for regulatory approaches as well as the ethics of policy interventions. Finally, in section four, researchers discuss treatment, prevention and management strategies for both diseases.

Some important findings presented in the book include the following:

- Healthy behaviours established in young people tend to translate into healthy habits in adulthood, which are subsequently modelled and passed on to the following generations.
- Eating according to hunger results in loss of excess weight.
- An individual genetically predisposed to obesity requires an obesogenic diet in order to manifest the genetic blueprint via gene-environment interactions. Epigenetics suggests that obesogenic diets not only render individuals incapable of losing excess weight, but may also have adverse impacts on the health of future generations.
- Discrimination against obese individuals is evident in all areas of life including social life, parenting practices, education, employment and healthcare. The stress which obese individuals are exposed to as a result of negative societal attitudes and behaviours can lead to further weight gain, and worse health outcomes.
- Regular physical activity and exercise, independent of weight loss, are effective in both prevention and treatment of diabetes. Prolonged sitting time might be associated with the risk of developing type 2 diabetes, independent of leisure-time physical activity.
- Obesity is linked to changes in the nutritional balance of our diet, with a primary role for protein appetite driving excess energy intake. Small changes in the percentage of protein in the diet can potentially yield big effects on intake, with consequences – both good and bad – for weight management.
- In considering approaches to the prevention of obesity, there are distinct and overlapping ethical concerns at both individual and population levels; at both levels moral compromise is necessary.
- School-based health promotion programs can have a positive and lasting impact on body image, eating behaviours, attitudes, and the self-image of adolescents. So promoting a healthy body image, establishing positive food habits and encouraging involvement in sport and physical activity at school can be catalysts for behavioural changes to improve health globally and reduce healthcare costs.
- Diabetes complications occur to some degree in practically every person who develops diabetes, although severe complications occur in only a minority. Because it has a high prevalence in Australia however, diabetes is the single commonest cause of end-stage kidney disease and the commonest cause of working-age blindness. Evidence from clinical trials indicates that by using current healthcare and therapy standards,

much can be done to prevent the onset and progression of diabetes complications. Prospective therapies to prevent and treat complications in diabetes include the agent fenofibrate and stem cells to treat diabetes and the organ affected by complications.

- A considerable body of evidence highlights the significant adverse health-related impact of childhood and adolescent obesity. Moreover, childhood obesity may track into adulthood, with further increased obesity-related morbidity and mortality.
- Organised high-quality diabetes care needs to be accessible and affordable to an increasing number of people with diabetes. Community pharmacists are a valuable resource of trained healthcare professionals that can be utilised to provide prevention and care services as part of an integrated primary care sector approach.
- Childhood obesity has become a major public concern in developing countries where the absolute number of children who are overweight or obese is now much higher than in developed countries.
- A holistic approach that considers how an individual configures their masculinity or femininity may assist in promoting and maintaining weight loss in obese individuals as it addresses the struggle in society experienced by many obese people. Weight-loss approaches that recognise the individual struggle with gender and the influence of other social structures may be an alternative to current, largely unsuccessful treatments of obesity.
- While weight loss can be achieved, the major issue in the treatment of obesity remains weight maintenance. Those individuals who lose weight and successfully keep it off undertake lifestyle changes that includes high levels of physical activity, eating breakfast and regular meals, and a diet that is low in fat. Self-monitoring is an important way of catching 'slips' early and correcting them.
- Promising societal and environmental responses to overweight and obesity include redesigning the built environment, providing active transport options, promoting the availability and accessibility of healthy food choices, restricting promotion of unhealthy foods, and implementing ongoing social marketing strategies to influence sustained healthy eating and physical activity behaviours. Achieving these things is a massive challenge. Government leadership, social planning and urban renewal that engages communities, businesses and other relevant stakeholders are fundamental to the process.

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