

**Women's Health Issues Paper
No. 8**



**Women's Health
Victoria**

Women and Food

October 2012

ISSN: 1837-4417

© Women's Health Victoria

Abstract

This paper explores various aspects of women's health relating to food. These include the impacts of nutritional deficiency, the links between nutrition and chronic disease, women's roles in relation to food, how a woman's relationship with food affects her psychosocial health and the socio-economic factors that impact on access to nutritious food.

Controversy exists in public health and health promotion about the approach and key messages that should be adopted in relation to food-related behaviours and body size to promote 'health' and prevent illness for women. This paper outlines various perspectives in this discourse and highlights some principles for managing health risks of public messages.

Women and Food

(Women's Health Issues Paper No. 8)

Compiled by: Bronwyn Upston

© Women's Health Victoria

Level 8, 255 Bourke Street
Melbourne Victoria 3000, Australia
(GPO Box 1160 Melbourne, 3001)
Telephone: 03 9664 9300
Facsimile 03 9663 7955
Email whv@whv.org.au
URL: <http://www.whv.org.au>

Published October 2012

ISSN: 1837-4417

This paper is also available at:

<http://www.whv.org.au/publications-resources/issues-papers>

Table of Contents

1. Introduction	2
2. The issue	2
3. Women’s diet and risk of nutrient deficiency	3
3.1 At risk groups.....	3
3.2 Risks and benefits of dietary preferences	4
4. Nutrition and chronic disease in women	5
4.1 Cardiovascular disease.....	5
4.2 Diabetes	6
4.3 Cancer	6
5. Women’s roles	7
5.1 As food providers.....	7
5.2 As food consumers	7
6. Psychosocial health	7
6.1 Women’s emotional needs.....	8
6.2 Food-related behaviours	9
6.3 Disordered eating.....	10
6.4 Relationship between food and mental health.....	11
7. Socio-economic determinants	12
7.1 Food insecurity	12
7.2 Dietary behaviours and socio-economic gradient.....	13
7.3 Access to a healthy diet	14
7.4 Vulnerability of particular groups of women.....	14
7.4.1 Women from culturally and linguistically diverse backgrounds.....	14
7.4.2 Women with disabilities	15
7.4.3 Aboriginal and Torres Strait Islander women	15
8. Perspectives on women, obesity and health	16
8.1 The ‘war on obesity’ and stigmatisation.....	16
8.2 Health at Every Size	17
8.3 Fat acceptance or liberation.....	18
8.4 Health risks of public messages.....	18
Conclusion	19
References	20

1. Introduction

Adequate and nutritious food is essential for good health. However when it comes to food, women's health is influenced by more than the nutrients consumed. While biologically determined factors of sex, age and physiological stage of life affect women's fundamental nutritional needs, it is gender and other socially and environmentally determined factors that mediate women's food consumption. These factors influence women's access to, motivation for and capacity to make, healthy food choices.

This paper explores various aspects of women's health relating to food. These include the impacts of nutritional deficiency, the links between nutrition and chronic disease, women's roles in relation to food, how a woman's relationship with food affects her psychosocial health and the socio-economic factors that impact on access to nutritious food.

Controversy exists in public health and health promotion about the approach and key messages that should be adopted in relation to food-related behaviours and body size to promote 'health' and prevent illness for women. This paper outlines various perspectives in this discourse and highlights some principles for managing health risks of public messages.

2. The issue

Nutrition is an area of health where sex and gender relevance is significant, especially in the context of cardiovascular diseases and the prevalence of eating disorders.⁵ Until the 1990s, research on women was largely neglected.⁵ This led to mostly gender-blind nutritional guidelines and health programs, that is, guidelines and programs that ignore or do not address gender on the assumption that no gender differences apply.⁵ More is now known about many of the gender differences related to food and nutrition. It is debatable whether current Australian and Victorian policy and programs account for these differences.

Body weight and poor diet are among the modifiable risk factors for cardiovascular disease and diabetes, both chronic diseases with a large health burden that therefore lend themselves to prevention strategies.⁷ Eighty-six percent of Victorian women do not eat the recommended quantity of fruit and vegetables as recommended by the *Australian guidelines for healthy eating*⁸ and 56 percent of Victorian women are overweight or obese.⁹ In overweight people, weight loss of five to ten percent can lead to improvements in cardiovascular and metabolic health.¹⁰ Based on past trends and no effective interventions, it is estimated that 75 percent of women aged 20 years and over in Australia are likely to be overweight or obese by 2025.¹¹

Food intake and eating behaviours impact on women's physical and psychological wellbeing in a complex interplay between the external environment and internal factors.

Food intake and eating behaviours impact on women's physical and psychological wellbeing in a complex interplay between the external environment and internal factors. Socially constructed idealized body image and normalization of dieting and other weight control behaviours have influenced many young women to adopt a relationship with food that has little to do with nutrition. Young women in Australia are at risk of developing disordered eating patterns that affect their quality of life.¹

Obesity has a greater impact on health outcomes for women than for men, playing out in their physical, reproductive, psychological and social well-being, as well as their access to

health services.¹² Obesity is related to early onset of puberty in girls, reduces chances for conception and increases the risk of complications in pregnancy for both the mother and her fetus.¹³

Interventions to improve dietary changes are designed to impact on modifiable factors at an individual level, such as dietary knowledge, beliefs and attitudes, and by improving psychosocial components. However, the long-term impacts of these interventions will be enhanced and facilitated by societal interventions that tackle the context and situation of the living environment, and the balance between health promotion and food industry marketing.¹⁴

3. Women's diet and risk of nutrient deficiency

Most Australian women do not consume foods in accordance with the *Australian guidelines for healthy eating* and this is associated with suboptimal nutrient intakes.¹⁵ Certain groups of women in Australia are more at risk than others of specific nutrient deficiency. In addition, women's individual dietary preferences and practices may confer either health benefits or health risks.

3.1 At risk groups

The *Australian dietary guidelines* and the *Guidelines for healthy eating* are currently being reviewed (2012). These guidelines provide recommendations for women and girls for different ages and stages of life. Adolescents, pregnant women, and older women are at higher risk of nutrient deficiency due to the physiological changes associated with the life stage:

- Adolescents tend to skip meals more often (especially breakfast) and have a diet high in sweets, highly processed foods, fried foods and fast foods, resulting in poor nutrition.¹⁶ Australian healthy weight adolescent females commonly adopt weight control behaviours that may put them at risk of subtle levels of under-nutrition.¹
- Women of childbearing age are at particular risk of poor health due to micronutrient deficiencies.¹⁷ There is strong evidence that a negative iron balance prevails in many apparently healthy women in developed countries due to a combination of poor diet and menstrual blood loss.⁵ Ninety-three percent of menstruating women have dietary iron intakes lower than the recommended dietary allowance.⁵
- Just over seventy percent of pregnant women have low levels of Vitamin D and the prevalence is even higher in women with gestational diabetes.⁵ Vitamin D is essential to bone health and is a factor in the pathogenesis of cardiovascular disease.⁵ Pregnancy is an event in a women's life course that causes increased nutrition awareness.¹⁸ However, this does not always translate into a diet suitable for pregnancy and general health needs. A study in Sydney in 2008 found low reported levels of vegetable and fruit consumption and high levels of soft drink and take-away/fast food among pregnant women who were first-time mothers.¹⁹
- Many Australian women over 40 years consume insufficient zinc, calcium and fibre.²⁰ Daily calcium intake tends to decline with advancing age: the intestinal absorption of calcium is reduced in older women relative to young women, and vitamin D deficiency contributes to declining calcium absorption.⁵ Age-related muscle loss is considered to

be a major risk factor for the development and progression of many common chronic diseases. Physical inactivity, inadequate protein intake and low vitamin D status have been implicated.²¹

- Older women who are housebound, in residential care or otherwise with restricted exposure to sunlight and decreased food intake are at risk of deficiency. The risk of undernutrition is prevalent among older in-patients with women three times more risk at than men.⁵ Poor oral health is a risk factor for undernutrition in older people.²² Ageing and medications may impair zinc uptake. Zinc has a role in wound healing and immune function. Low zinc levels can lead to reduced taste sensation which in turn can affect food intake (quantity and choice of foods) putting older women at risk of deficiency and over consumption of salt.²² Ageing also decreases thirst sensation and dehydration can go undetected, leading to electrolyte imbalance and confusion.²²

In addition, women's use of oral contraceptives and hormone replacement therapy may affect the absorption and availability of certain nutrients.⁵ The use of intrauterine devices by women is associated with a higher frequency of iron depletion (28.1 percent) than in those using oral contraceptives (13.6 percent).⁵

3.2 Risks and benefits of dietary preferences

A woman's dietary preference may confer nutritional benefits and risks. A vegetarian diet is associated with many health benefits because of its higher content of fibre, folic acid, vitamins C and E, potassium, magnesium, many phytochemicals (such as flavonoids) and a fat content that is more unsaturated.²³ However, women who are vegetarian have an increased risk of nutrient deficiency in protein, minerals (including iron, calcium and zinc), Vitamin B12 and Vitamin D.¹⁶

Compared with other vegetarian diets, vegan diets tend to contain less saturated fat and cholesterol and more dietary fibre. Vegans eliminate all animal products from their diet and are at higher risk of nutritional deficiencies including vitamins B12 and D, calcium, omega-3 fatty acids, iron and zinc.²³

A traditional Mediterranean diet consists of: low glycaemic-load carbohydrates; high levels of unsaturated fat; a high amount of antioxidants in the form of a widely varied mix of fruit and vegetables; and whole, minimally processed foods and legumes, nuts, and lean proteins, especially fish. This diet has been found to halve the incidence of new-onset diabetes in an at risk group over a four year period compared with a low-fat diet. This outcome occurred in the absence of significant changes in body weight or physical activity indicating that it is possible to reduce the risk of diabetes without weight loss by changing the food eaten.⁵

Diets rich in flavonoids (natural substances found in plant foods) are beneficial for women due to their estrogen-mimicking effects that reduce the incidence of cardiovascular disease and osteoporosis.⁵ Flavonoids reduce the levels of total cholesterol, low density lipoproteins and triglycerides in the blood.⁵

The typical Western diet is high in energy, saturated fat, sugars and salt, and contains many common foods that limit iron absorption, for example tea, coffee and unprocessed bran. Women's diets should include foods that are rich in iron with high bioavailability (the extent and rate to which a drug is taken up by the body in a physiologically active form), for

example red meat, chicken and fish.^{5,22} Alcohol and concentrated sources of calcium (usually supplements) may also impair iron absorption.²⁴ Eating fresh fruit and vegetables high in Vitamin C alongside iron rich foods helps to improve iron absorption.²⁵

Although spending more money is associated with a healthier diet for women, large improvements in diet may be achieved without increased spending. Increased spending on nuts, soy and beans, and whole grains, and less spending on red and processed meats and high-fat dairy, may be the best investment for dietary health and a reduction of cardiovascular disease for women living in developed countries.²⁶

As a weight regulation strategy, consuming more frequent small meals throughout the day may be a less effective strategy for women than it is for men.⁵ The effect of meal frequency on the regulation of energy balance differs between men and women.⁵ Carefully controlled studies have found that, although the relationship between increased meal frequency and reduced appetite/body weight is strong for men, it is absent in women.⁵

4. Nutrition and chronic disease in women

Food quality and quantity is known to affect a woman's health and risk of developing certain diseases, and in different ways to men. Recent evidence has shown that suboptimal levels of vitamins, even when well above levels causing deficiency syndromes, are risk factors for chronic diseases such as cardiovascular disease, cancer, osteoporosis and depression.⁵ Excess energy from food contributes to overweight and obesity, with implications for a woman's physical health and psychological wellbeing.

Food quality and quantity is known to affect a woman's health and risk of developing certain diseases, and in different ways to men.

4.1 Cardiovascular disease

Sex differences in body fat distribution are associated with different diseases.⁵ Visceral fat (which is stored around the body's vital organs in the abdominal cavity) has been associated with increased risk of heart disease and metabolic disorders, so men and post-menopausal women typically have increased risk relative to pre-menopausal women.⁵ There is mounting evidence to suggest that larger gluteo-femoral (hip-thigh) fat stores are protective against these risks, with larger hip circumference shown to be protective in multiple ethnic groups independent of waist circumference or abdominal fat.⁵ A high waist-to-hip ratio may be a better predictor of cardiovascular disease mortality than a large waist circumference alone.⁵

Post-menopausal women lose less visceral fat during weight reduction than pre-menopausal women, reflecting the role of estrogen in regulating the abdominal fat stores in women.⁵ Estrogen also plays an important protective role in cardiovascular disease by regulating blood cholesterol levels and maintaining the health of vascular tissue.^{5 27} The levels of estrogen in premenopausal women are protective against cardiovascular disease.²⁷

Primary prevention of cardiovascular disease in women is critical because first cardiovascular events in women are often fatal.²⁸ This higher mortality rate at first event is primarily due to age but women also experience delay in treatment and less aggressive treatment than men.^{28 29} Particular fats and fat compounds circulating in the blood - triglycerides and low density lipoproteins (LDL) - are crucial cardiovascular disease risk

factors in women and respond to nutritional intervention.²⁸ A high level of triglycerides in the blood is a cardiovascular disease risk that increases with age.⁵ Evidence exists to support multiple dietary recommendations to lower cardiovascular disease risk.²⁸

High carbohydrate low-fat diets can produce high triglycerides and LDL levels and elevate weight gain.⁵ Pregnancy, hormone replacement therapy and oral contraceptives lead also to an increased level of triglycerides in the blood.⁵ A large randomized controlled dietary modification trial in post-menopausal women, found that a reduction in total fat intake and an increased intake of vegetables, fruits and grains did *not* significantly reduce the risk of cardiovascular disease.⁵ It is the quality of fat, rather than amount, which has a different effect between men and women due to differences in fat distribution and metabolism.⁵ Consumption of foods rich in omega-3 fatty acids (those found in oily fish) appear to exert a beneficial effect on human health and are recommended particularly in post-menopausal women who are at risk of cardiovascular disease due to high blood triglyceride levels.⁵

4.2 Diabetes

The diabetes risk for obese women is many times that of women considered to be in the normal weight range. The relative risk of developing type 2 diabetes for a woman with a body mass index of 30 kg/m² is 28 times that of a woman with a body mass index less than 22 kg/m².¹² (Body mass index is calculated by dividing weight in kilograms by height in metres squared [m²]). By comparison, the difference in risk for men between these two measures of body mass index is only seven-fold.¹² Therefore obesity appears to be a greater risk factor for diabetes in women than in men.⁵ In addition, women with diabetes show a greater increase of risk of cardiovascular diseases and a higher mortality than men with diabetes.⁵

Obesity appears to be a greater risk factor for diabetes in women than in men.⁵

4.3 Cancer

The importance of diet, particularly plant-based foods, in cancer prevention has been confirmed⁵ and the *Australian dietary guidelines* reflect recommendations based on the best evidence to date. Evidence of whether diet has sex specific effects in cancer prevention is not conclusive. However some episodic sex specific effects have been described in the research, for example, in the study of colorectal cancers in men and women and links to body weight, folic acid, dietary fibre and red meat consumption.⁵

Greater consumption of foods rich in vitamins A, C and E and fibre is associated with a lower risk of breast cancer. Concentrated supplementation has no effect on this risk, except vitamin A for women whose dietary intake is inadequate.²⁰

Men and women have different alcohol metabolism and distribution.⁵ Women develop damage at lower levels of alcohol consumption over a shorter period of time.⁵ Women are more susceptible to alcohol-related organ damage, including breast cancer and osteoporosis.⁵ Alcohol consumption increases the risk of breast cancer by 9%, with each additional alcoholic drink per day being relevant to risk level.⁵

High body mass index in women is known to increase the risk of endometrial cancer, kidney cancer, postmenopausal breast cancer and adenocarcinoma (a type of malignant tumour) of the oesophagus.³⁰ Obesity increases a woman's risk of developing certain subtypes of ovarian cancer.³¹ High body mass index may also increase the risk of multiple myeloma,

leukaemia, pancreatic cancer, non-Hodgkin's lymphoma, and ovarian cancer in women.³⁰ Obesity is a barrier to screening for breast and cervical cancers for women.³² Obese women may delay seeking health care, including routine gynaecological and breast cancer screening, due to perceived and actual barriers and biases of healthcare providers.³³

5. Women's roles

Women are largely responsible for food purchasing, meal choice and preparation in Australian households.³⁴ This section briefly explores women's roles as food providers and food consumers.

5.1 As food providers

Women traditionally, and largely still today, adopt the role of family food gatekeeper, especially in families with children.³⁵ Therefore many women are responsible not only for their own diets, but also for their family's diet.³⁵ A woman's food choices may come second to that of their partner or children due to the social norm of women sacrificing their needs for others.³⁵

Women's practice of providing food is shaped by a process of trade-offs between preferred practices (for example, eating well or healthily) and constraints operating at the time. Such constraints include time, unpredictable events and level of cooking ability.³⁶ In younger women, lack of confidence in cooking ability may be linked to limited exposure to meal preparation as children.³⁶ Therefore, women's preferred dietary intake is strongly influenced by their ability in food preparation and other family member's food preferences.

5.2 As food consumers

The marketing of food is gendered, in that food is marketed to women and men in different ways. To what degree these differences are simply mirroring the variations in dietary behaviour or shaping them is unclear – both may be possible.³⁷ An analysis of UK magazines found differences in nutritional contents of foods that were advertised according to the socio-economic and gender profile of readers reflect known differences in dietary intake, knowledge and behaviour among these readers.³⁷

Also important in women's food choice is the appeal of food to be health-giving in some way. Women consumers in Australia regard the food advertising term '100% natural' to be both persuasive and credible, with connotation of multiple benefits – promise of freshness, minimal processing and no artificial ingredients.³⁸ This highlights how health is an important concern for women in decisions about food purchases.

6. Psychosocial health

Women's relationship with food is complex, and impacts on women's psychosocial health. Food may gratify emotional needs as well as the body's nutritional requirements. Food related behaviours may be health enhancing (for example planning and preparing regular nutritious meals) or damaging. Dieting, skipping meals and inducing vomiting are examples of harmful behaviours that may start in adolescence and lead to established patterns of disordered eating behavior into adulthood. Women's relationship with food is also mediated by the external environment. For example, women's self-perception based on body size is strongly influenced by social influences and expectations. The result is that body image

dissatisfaction negatively impacts on women's mental health. Women may use certain foods to self-medicate a depressed or anxious state.

This section explores the relationship between food and women's psychosocial health, in particular how it relates to women's emotional needs, gendered food-related behaviours and disordered eating. The relationship between food and women's mental health, including mental illness is also discussed.

6.1 Women's emotional needs

Women's emotional needs that are gratified by food preparation and eating will vary according to a psychological need state. Need states (or motivational states) are generally transient. One study of middle-aged women describes eight different need states on a continuum of emotional gratification.³⁹

- On the lowest end of the continuum eating may be considered a *mindless pastime* where eating is more of a motor activity, with little or no emotional connection. Consumption of mainly snack foods provides women with oral gratification when bored or when involved in other more dominant activities such as watching a movie, socializing with others, drinking or food preparation. Women may overeat because there is limited consciousness of how much was eaten.
- The *habitual* need state is one in which foods are consumed as part of a routine establishing a sense of normalcy and comfort.
- In the *low effort* need state women eat food that will satisfy hunger quickly and easily with as little time and effort as possible. Other activities have a higher priority than food preparation.
- The *pursuing health* need state is expressed in two different approaches - one is about balancing the nutritional qualities of the food consumed, and the other involves the balancing of the amount of food consumed. With respect to the first approach, women derive a sense of well being and accomplishment in return for proactively taking care of themselves and a sense of guilt if they do not. Balance is viewed as important for long term health benefits as well as more short term physical effects such as a sense of well being, mood or outlook. Balance is also seen as requiring effort and conscious planning in a general sense and was not based on a precise formula. With the second approach, balance is physically oriented around satiation and the need to control food intake to avoid overeating or being hungry. Compensation in the amount of food consumed is described as remedial to fix a problem. The amount of food eaten over time is balanced to compensate for overindulging.
- In *soothing* eating, food is a means of changing one's emotional state. The individual may be experiencing feelings such as boredom, fatigue, stress, anxiety or anger, and eating is intended to provide a short term release to cope with the situation or to serve as a reward or release. The role of food in this need state is to provide a sense

Women's emotional needs that are gratified by food preparation and eating will vary according to a psychological need state.

of anticipation and absorb the individual's attention through delivering high gratification.

- When the need state is *nurturing*, women feel responsible for caring for others and managing a shared eating occasion, for example dinner at home where the meal acts as a catalyst for family time and bonding. Women with more interest and involvement in food preparation are more likely to derive a sense of creativity and accomplishment in providing food that requires more skill to prepare.
- In the *social* need state women enjoy food as the catalyst for social interaction and creation of social bonds. Food may form part of the entertainment and contribute to the event as being special and memorable. Women who play a role in hosting or contributing to a group effort may be motivated by a need for recognition or social standing. In these occasions more elaborate and filling foods are prepared and consumed.
- In the *celebratory* need state people gather together for a special occasion and food is a part of the festivities. This is similar to the *social* need state, however these occasions are often associated with memories, traditions and culture where specific, meaningful or ritualistic food is consumed.³⁹

This continuum of need states in relation to food provides a framework with which to understand the complex relationship that women have with food. It may be useful to inform policies and programs to promote women's healthy individual behavior change within a social context.

6.2 Food-related behaviours

Women have a greater tendency than men to engage in healthy behaviours when empowered with health knowledge.⁴⁰

Women who exhibit the behaviours of organisation and forward-planning in relation to meals, and who enjoy and place a high value on food shopping, preparation and consumption, are more likely to have healthier intakes of fruit and vegetables.⁴¹ Fruit and vegetable consumption is significantly higher amongst women who live with others than those who live alone, and food planning mediates the association.⁴² Food planning mediates the association between women's living arrangement and fruit consumption (by 8%) and vegetable consumption (by 13%).⁴²

Women who plan their eating behaviours by thinking about what to do in order to achieve their goal (called 'approach food planning', a form of autonomous regulation) are more likely to develop healthy eating behaviours than women who plan their eating behaviours by what to avoid in order to move away from an undesired outcome, such as being overweight (called 'avoidance food planning', a form of controlled regulation).⁴³

An identified barrier to health eating by women is perceived time pressure. Forty percent of Melbourne women perceive this as the main barrier to healthy eating, with long hours at either work or study being the most significant cause.⁴⁴ Women aged up to 39 years were more likely to report time pressure as a barrier to healthy eating than older women.⁴⁴ Women

who reported time pressure as a barrier were 40% less likely to meet Australian fruit consumption guidelines (two serves per day) and 47% less likely to eat three or more servings of vegetables (Australian guidelines recommend at least 5 serves per day).⁴⁴

6.3 Disordered eating

Being female and experiencing puberty are key risk factors for the onset of disordered eating.⁴⁵ Additional risk factors are childhood experiences including alcoholism of a family member, absent or ill parents, having carers with eating disorders, experiencing physical or sexual abuse, lack of 'normal' eating role models and living in refugee camps.⁴⁵

Australian healthy weight adolescent females commonly adopt weight control behaviours such as dieting, skipping meals and inducing vomiting.¹

Young women in Australia are at risk of developing disordered eating patterns that affect their quality of life. Australian healthy weight adolescent females commonly adopt weight control behaviours such as dieting, skipping meals and inducing vomiting.¹ A large longitudinal survey over a period of 12 years examined the long-term impacts of subclinical levels of disordered eating and found that even apparently minor symptoms are associated with significant and far-reaching deficits in well-being.⁴⁶

Women with high expectations for themselves, which are encouraged by sociocultural factors, may feel dissatisfied with their bodies, relationships and achievements leading to a lowered self-esteem, dietary restriction and a depressive affect, increasing the risk of binge eating and weight gain over time.⁶

Repeated exposure to media, and to both direct and indirect (via media's effects on peers, parents, coaches, physicians, etc) pressures from media to be thin constitute risk factors for body dissatisfaction, concerns over weight and disordered eating behaviours in adolescent girls and young women.⁴⁷ Media and mass cultural representations have homogenized and normalised ideal female images so that both men and women critically view women's bodies (objectification).⁴ Women learn to be insecure about their bodies, to monitor for signs of imperfection, and to continually undertake self improvement to fit the ideal.⁴ Stigmatisation of women who are overweight or obese intensifies feelings of anxiety and depression that increase disordered eating and thus, further weight gain.⁴ Discourses that hold that weight loss equates to health compound a woman's sense of failure when she is unable to achieve an 'ideal' weight.⁴⁸ Behavioural weight loss programs, particularly those which include a body image module can be an effective way of improving body image.⁴⁹

Women learn to be insecure about their bodies, to monitor for signs of imperfection, and to continually undertake self improvement to fit the ideal.⁴

Not all women exposed to the media and its effects develop disordered eating. In developed countries, the prevalence of anorexia nervosa and bulimia nervosa among late adolescent and adult women is 0.5 - 1.0% and 1.0 - 2.0% respectively, and it is estimated that a further 8 - 15% have significant levels of subclinical symptoms.⁵⁰ Psychological factors such as anxiety, mood, perfectionism, emotion dysregulation, disturbed body image and self esteem are implicated in onset of eating disorders.⁵¹ Young women who demonstrate disordered eating attitudes are more likely to have lower levels of emotional intelligence (the ability to

identify and express emotions) and higher levels of *overweight preoccupation* compared to women with normal eating attitudes.⁵¹

Gender-related practices such as body surveillance (chronic self-objectification), self-silencing (suppression of own expression of thoughts and feelings, putting other's needs first), and anger suppression are mediating mechanisms through which thin-body ideal internalization lead to body dissatisfaction and eating disorders in women.⁵⁰ Interestingly, in women with lower levels of emotional awareness, self-silencing is unrelated to disordered eating, while in women with higher levels of emotional awareness who also employ self-silencing, higher levels of disordered eating behaviours are reported. These observations indicate that where there is dissonance between actual and expressed thoughts or feelings, women may employ disordered eating behaviours as a means to cope with the tension created.⁵² Supporting women to value and express their own thoughts, feelings and experiences would seem to be fundamental to promoting healthier eating behaviours.

6.4 Relationship between food and mental health

Extreme concerns about eating, extreme weight/shape concerns and extreme dietary restriction are strongly associated with mental health impairment in Australian urban women.⁵³

The relationship between stress, coping strategies and disordered eating is not conclusive due to the scarcity of longitudinal studies.⁵⁴ While many cross-sectional studies find a relationship between stress and disordered eating, some robust studies have demonstrated that disordered eating predicted later stress, but not the reverse.⁵⁴ Women engaging in disordered eating behaviours report a significantly greater reliance on coping strategies which are characterised by an inward focus on the self (for example, self blame) or by avoidance.⁵⁴

Unhealthy eating and weight loss behaviours may be used by women experiencing post traumatic stress disorder symptoms to decrease symptoms or to control how the memory of the trauma makes them feel.⁵⁵ There is an established link between the ingestion of fast food and soft drinks and post traumatic stress disorder symptoms that persists after accounting for disparities in race, ethnicity, marital status, education, income level and body mass index.⁵⁵ Women experiencing post traumatic stress disorder symptoms may be using certain types of food to self-medicate a depressed state.⁵⁶ Food and classic addictive substances, such as nicotine, compete for the same brain pathways and may serve the same purposes psychologically.⁵⁶

Disordered eating is more common in overweight individuals and is associated with both weight gain and the development of eating disorders over time.⁶ Obesity and disordered eating share many common characteristic and are risk factors for each other.⁶ Programs which both challenge contemporary sociocultural behaviours and cognitions (such as media exposure and perfectionism) and promote healthy living strategies may have positive synergistic effects.⁶ A South Australian multidisciplinary health care team's program, *Dieting: The Big Con*, is an example of an integrated health promotion approach.⁴⁸ It valued women's lived experiences and focused on social and cultural issues, nutrition, mental health and physical activity. It helped women develop skills

Disordered eating is more common in overweight individuals and is associated with both weight gain and the development of eating disorders over time.⁶

to critique the impact of dieting messages in the media and the community, and to challenge the nature and focus of their goals, for example from weight loss to making better health choices or seeing success as improved self-esteem rather than attaining a goal weight.⁴⁸

Eating disorders are serious mental illnesses.⁵⁷ Two of these disorders, anorexia nervosa and bulimia nervosa, are among the leading causes of disease and injury in young women.⁵⁸ The most common pathway into eating disorders appears to be through strict dieting – Australian female adolescents who diet are 18 times more likely than those who do not diet to develop an eating disorder within six months.⁵⁹ Approximately 16 percent of adult women in Australia will experience an eating disorder in their lifetime.⁶⁰ Women with eating disorders may be reluctant to raise this with health practitioners. However they report that they would welcome non-judgmental direct questions about their eating behaviours when seeking help for overweight or other health issues.⁶¹

Better diet quality in adult Australian women is associated with a lower likelihood of depressive and anxiety disorders and with fewer psychological symptoms.⁶² This association is independent of age, socioeconomic status, education, physical activity and other lifestyle factors.⁶² For midlife women, depressive symptoms are positively associated with fast-food intake⁶³ and high energy sweets.⁶⁴ The causal pathway is unclear, however the association may be bidirectional, in that depression contributes to the development of certain eating patterns and consumption of certain foods is a risk factor for depression.⁶³ Appetite changes are a common feature of depressive illness.⁶³

7. Socio-economic determinants

Women's food access, behaviours and health outcomes in Australia are strongly influenced by the socio-economic determinants of income, education and location.⁶⁵ The environment in which food is prepared, shared and consumed significantly shapes women's nutritional experience, with some groups particularly vulnerable.

7.1 Food insecurity

Women are at higher risk of food insecurity globally. Gender inequality is linked to poverty, hunger and poor health for women, impacting on their children and the well-being of the community as a whole.⁴⁰ It is estimated that currently five percent of adults in Australia have insufficient food although the figure could be higher.⁶⁶ An Australian National University poll on food security in 2011 found eight percent of respondents reported that food had often or sometimes run out and they didn't have enough money to buy more food.⁶⁷ Food insecurity is not simply a lack of food, however. It also describes a situation in which access to and consumption of nutritious food has been limited in some way, for example by having to rely on emergency food relief. Income has been established as one of the most important determinants of food security.⁶⁸

There are three levels of food security, which lie on a continuum:

1. *Secure*—having continual access to sufficient, safe and nutritious food
2. *Insecure but without hunger*—food is regularly consumed, but there may be intake of food with poorer nutritional quality and occasional meal skipping
3. *Insecure with hunger*—sufficient food to meet nutritional needs or to avoid hunger is commonly not obtained.²

In Australia most food insecurity would be considered to be in the second level. The risk of food insecurity is higher in people who are unemployed, in single parent households and those in the two lowest wealth quintiles, and this has remained constant over time.² The prevalence of food insecurity in Western countries has been consistently found to be higher in females than in males.⁶⁸

In 2009–10 Australian households in the highest income group spent an average of \$389 on food and beverages, or 18 percent of their total household expenditure, while households in the lowest income group spent \$113, or 20 percent of total household expenditure.⁶⁶ So those in the lowest income group spend three times less but a higher proportion of income on food and beverages than people in the highest income group. Low income households spent \$17 (15 percent) on vegetables and fruit, compared with \$38 (10 percent) by high income households.⁶⁶

Food insecurity is associated with both nutritional deficiency and obesity in women. Micronutrient deficiency associated with the food insecurity of women in Western countries (such as the US and Canada) include calcium, iron, magnesium, zinc, folate and vitamins A, B1 (thiamin), B6, B12, C and E.¹⁷

The risk of obesity is estimated to be 20 percent to 40 percent higher for women who experience mild to moderate food insecurity.²

The risk of obesity is estimated to be 20 percent to 40 percent higher for women who experience mild to moderate food insecurity.² The relationship between women's food insecurity and weight is complex and not clearly defined.¹⁷ In cross-sectional studies in the United States, food insecurity has been associated with obesity among women, but the direction of the association and its causality are unclear.¹⁷ Obesity combined with food insecurity presents the greatest risk of major weight gain.⁶⁹

Food insecurity in women is also associated with anxiety and depression – but again the direction of associations and causality is not clear.¹⁷ A clear association has been established between food insecurity and poor coping strategies.¹⁷ Food insecurity is also associated with poor pregnancy outcomes, including low birth weight and gestational diabetes.¹⁷

A multifaceted approach is required to address food insecurity – one which provides both short-term assistance and longer-term developmental strategies. Such strategies include addressing behavioural and coping strategies, acknowledging the mental health components of food insecurity, challenging gender norms and ensuring women have access to the same economic opportunities and power as men.¹⁷

7.2 Dietary behaviours and socio-economic gradient

In Australia, women of low socio-economic status are less likely to adopt dietary practices consistent with the *Australian dietary guidelines* due to individual, social and environmental factors.³⁵ Australian urban women of low socio-economic status value traditional and familiar dietary practices, report time constraints due to work for food preparation, experience lack of support from family members to eat healthier options and are exposed to more fast food outlets in their local area at higher rates than women from higher socio-economic status

groups.³⁵ Low socio-economic status shoppers purchase significantly more non-core foods, especially chips and sugar sweetened drinks.⁷⁰

Not all women of lower socio-economic status eat poorly, however. Women who are resilient to poor dietary behaviours report higher confidence and self-efficacy for eating a healthy diet and avoiding fast food, preferring fruit and vegetables and using meal planning strategies.⁷¹ These women also report having more support from family and friends and having fresh food available in their neighbourhood.⁷¹

7.3 Access to a healthy diet

The healthy diet recommended in the *Australian dietary guidelines* is unaffordable for welfare-dependent families in Australia (almost 20 percent of the population), who would need to allocate at least one-third of their weekly income to food.⁷² Using generic instead of market brands can improve affordability, however healthy options are not always readily available.⁷² The cost of food in rural Victoria varies in a manner that appears unrelated to remoteness, population, socioeconomic status or distance from the metropolitan centre, however the price of vegetables and legumes varies more than cereals, non-core foods and unhealthy foods.⁷³

'Food deserts' are areas where there is limited access to healthy food choices. The debate about the existence and characteristics of food deserts has increased the interest in food availability and equity in the health research community. This debate is crucial to an understanding of the factors leading to food security. It seems that much depends on the measure that is used. If access to a major supermarket is used as a proxy for access to a healthy diet and access to a fast-food outlet as proxy for access to unhealthy food, then living in a less advantaged area means it is easier to access unhealthy food (because more advantaged areas have closer access to supermarkets and less advantaged areas have closer access to fast food outlets).⁷⁴ However, South Australian research has found that living in a food desert does not, by itself, impose food access difficulties. It suggests that food access problems in Adelaide are not so much the product of geographic distance between home and shop, as the social or welfare networks that allow people to access private transport.⁷⁵ So it is affordability and access to private transport, rather than distance itself that may determine healthy food access in the urban environment.

7.4 Vulnerability of particular groups of women

7.4.1 Women from culturally and linguistically diverse backgrounds

Whatever their cultural background, women are influenced by the prevailing norms of the predominant culture and accessibility of food types. Pre-existing (and possibly health protective) attitudes, beliefs and behaviours about diet, food and body image may be changed as a result. One South Australian study of students from Australia, Malaysia and Samoa found Malaysian and Samoan female students newly living in Australia were influenced by Western ideals of weight and shape, however the Australian students exhibited the most negative attitude to their body image.⁷⁶ A study of young women of African and South Asian descent living in the United Kingdom found that women from each of the ethnic minority groups had assimilated the fast-food aspect of the British diet into their eating habits.⁷⁷

7.4.2 Women with disabilities

Women with physical disabilities report that their nutrition-related behaviours are facilitated by their social and structural environment – income, assistance with shopping or cooking, and food delivery services.⁷⁸ Better mobility, greater self-efficacy for nutrition and more vitality (psychological measure) are indicators of better nutritional behaviours in women with physical disabilities.⁷⁹

The environment exerts a powerful influence on the nutrition and dietary practices of adults living with an intellectual disability. For example, in the United States adults with an intellectual disability residing in smaller, less supervised settings (such as group homes and family households) have a significantly higher rate of obesity compared to those living in larger and more supervised, institutionalised settings.⁸⁰ Obesity presents a substantial threat to the livelihood of women with an intellectual disability and may have an effect on community participation, independent living, and healthy years of life.⁸⁰ Women with an intellectual disability are particularly at risk of the negative health effects of poor diet. High blood pressure and cholesterol levels are more frequent in overweight and obese learning-disabled women than in other women in the community.⁸¹ A US survey of nutritional status and dietary problems in adults with intellectual disabilities aged 20–50 years who were living in the general community found that the frequency of overweight and obesity was more than twice that of women in the general community who did not have an intellectual disability. This difference was not observed in men.⁸¹ As previously discussed in section 4.3, due to their obesity these women are less likely to access health screening for breast and gynaecological cancers.³²

Women with an intellectual disability are particularly at risk of the negative health effects of poor diet.

7.4.3 Aboriginal and Torres Strait Islander women

Food insecurity and obesity rates are higher for Indigenous women than non-Indigenous women with significant impacts on health and life expectancy. The national gap between Indigenous and non-Indigenous life expectancy for females is 9.7 years.⁸² After tobacco, high body mass and physical inactivity are the most significant risk factors affecting Indigenous health. Indigenous women are around one-and-a-half times as likely as non-Indigenous women to be overweight/obese.⁸³ Twenty one percent of Indigenous Victorians surveyed in 2004-2005, had run out of food at least once in the last 12 months, compared to five percent of non-Indigenous Victorians.⁸³

Health promotion initiatives for Indigenous women that target the individual may have less success than those that embrace women's relationships or connectedness to the land. For example, Aboriginal people living in Melbourne see non-insulin dependent diabetes mellitus as the result of living a life out of balance, a life of lost or severed connections with land and kin and a life with little control over past, present or future. The three levels of connectedness considered important in determining an individual's susceptibility not only to diabetes but to all disease are (1) family, (2) community and (3) society.⁸⁴

For urban Aboriginal women certain approaches are found to lead to more sustainable healthy eating changes. These include: a household rather than an individual framing of nutrition promotion; providing positive ideas for cooking; and opportunities such as cooking workshops in relaxed group environments.⁸⁵

8. Perspectives on women, obesity and health

This section explores different perspectives on women, obesity and health including stigmatisation, health at every size and fat acceptance. Health promotion policies and

For many overweight or obese women, the public health 'war on obesity' message has become personalised as the 'fight against fat people'.

programs that operate within the current weight-centred health paradigm have the potential to negatively impact on the health and wellbeing of individuals and communities, through dissatisfaction, dieting, disordered eating, discrimination and death.⁸⁶ An alternative is the 'health at every size' paradigm which aims to move the focus away from weight and towards health for all people, irrespective of body size or weight.⁸⁶

8.1 The 'war on obesity' and stigmatisation

Prevailing government public health messages about overweight and obesity are underpinned by economic drivers to curtail spending on chronic disease – the costs of which are spiralling. The total cost of obesity in 2008 in Australia was estimated to be \$58.2 billion and in Victoria at \$14.4 billion.⁸⁷

From an individual perspective, overweight and obesity is caused by an overconsumption of energy from food and a lack of energy expenditure through physical activity. Current government public health strategies to reduce overweight and obesity are based on the same formula – reduce consumption of certain (energy dense) foods, increase the consumption of nutrient rich foods (such as fruit and vegetables) and increase physical activity. With some notable exceptions (such as food reformulation to reduce salt or fat content), the interventions often target individuals or specific groups by employing social marketing campaigns and information provision to raise awareness of a healthy waistline and better food choices.

General guidelines for 'healthy weight' are based on the normal range measured by the body mass index - an internationally utilized tool for determining the correct weight range of a person based on their gender and height. It labels a person as either 'underweight, normal range, overweight or obese'. An additional measure, waist circumference is used to measure the level of risk related to visceral fat. (As previously discussed in section 4.1, hip to waist ratio may be a better predictor of risk for cardiovascular disease in women than waist circumference alone.) These measures do not account for race differences.

For many overweight or obese women, the public health 'war on obesity' message has become personalised as the 'fight against fat people'. By focussing on body size in public health messages there is a risk of further stigmatisation of women who are overweight or obese. This in turn can affect mental health and lead to further weight gain.⁴ Discourses stating that weight loss equates to health compound a woman's sense of failure when she is unable to achieve an 'ideal' weight.⁴⁸

The challenge of reducing stigmatisation of obese women is a difficult task. It is pervasive in most spheres of life and exists directly (for example, being abused when using public transport), environmentally (for example, not being able to fit into seats on planes) and indirectly (for example, people staring at the contents of their supermarket trolley).⁸⁸ Participants in a 2008 Australian study reported that while more subtle forms of stigma had

the most impact on their health and social wellbeing, it was the interaction between direct, environmental and indirect stigma that created a barrier to participation in health-promoting activities.⁸⁸ These subtle, less direct forms of stigmatisation may be happening, in Western cultures at least, as a result of spontaneous and unintentional reflexes of people.⁸⁹ In other words, the 'anti-fat' bias is a deeply ingrained, almost inevitable response to obesity.

Fat prejudice is likely to become an increasingly common psychosocial problem in light of the increase in global obesity.⁹⁰ Anti-fat bias may be firmly entrenched in people's automatic affective reactions, known as implicit attitudes, posing a challenge for health promoters to reduce stigma and promote body acceptance.⁹⁰ These implicit attitudes are automatically activated evaluations which are not necessarily congruent with personally endorsed beliefs.⁹⁰ (Explicit attitudes, in contrast, are personal beliefs in what is true resulting from mental processes of evaluative judgement and reflection.)⁹⁰ The empirical data of experimental studies highlight that there is a strong implicit anti-fat bias evident among many groups including university students, members of the general public, health professionals, and among those who are themselves overweight or obese.⁹⁰ Formulating appropriate public health messages whilst also challenging weight bias and promoting acceptance of diversity in body size is complex given that changing these implicit anti-fat attitudes may need to be through modifying the underlying associative structures and/or by altering the pattern of activation in the human brain itself.⁹⁰

Using personal behaviour change models to reduce population obesity have not been successful because complex biological drives such as hunger are largely resistant to behavioural change interventions in environments of abundance.⁹¹ Obesity has a macro-economic driver and this is observed in poor countries where increases in wealth initially enable the population to achieve a healthy body weight but continued increases result in obesity.⁹¹ Therefore, in order to be effective, public health advocacy should maintain and strengthen its work to influence the food supply at all levels.

8.2 Health at Every Size

A grassroots movement opposing a focus on weight and body size as the way to promote health has emerged in the United States and has supporters around the globe, including in Australia. The movement, known as *Health at Every Size* includes healthcare workers, health researchers, activists and consumers who advocate an alternative public health model for people of all sizes due to the failure of weight loss dieting and the negative health impacts of eating disorders.³ The health at every size approach emphasises self-acceptance and healthy day-to-day practices, regardless of whether a person's weight changes.³ A person's health will improve simply by engaging in healthy behaviours, for example through eating a nutritious diet and regularly exercising.⁹² The health at every size approach has been misrepresented by some to mean that an individual is healthy at any size, when in fact this is not the message of the movement.⁹²

The health at every size approach emphasises self-acceptance and healthy day-to-day practices, regardless of whether a person's weight changes.³

Recent Australian research found that obese adults strongly support non-commercial interventions that are focused on encouraging individuals to make healthy lifestyle changes (regulation, physical activity programs, and public health initiatives) rather than interventions perceived to be invasive or high risk (gastric band surgery), stigmatising (media campaigns),

or commercially motivated and promoting weight loss techniques (commercial diets and gastric banding surgery).⁹³

8.3 Fat acceptance or liberation

It is well documented that obese adults face pervasive and repeated weight-based stigma.⁹⁴ Fat acceptance or liberation groups such as *The Big Fat Blog* and the *Fat Rights Coalition* have formed to change the societal, personal and medical attitudes surrounding fatness. Members believe that deliberate attempts to lose weight are unhealthy, particularly yo-yo dieting, as it results in poor health outcomes, is largely unsuccessful and contributes to poor self-esteem through a cycle of disappointment, shame and humiliation arising from the person's apparent failures.⁹⁵ A recent study by researchers from Monash University found that people who belonged to a fat-acceptance community (the *Fatosphere*) reported improved mental health and wellbeing, and felt supported to engage in healthy activity. The *Fatosphere* provided a pathway for members to counter and cope with weight-based stigma and was not found to promote unhealthy lifestyles.⁹⁴

Whether acceptance of body size irrespective of weight is health promoting or not remains controversial. Evidence suggests that individuals have become more tolerant of higher body weights over time.⁹⁶ A large US cross-sectional study explored the relationships between ideal weight, obesity, body weight satisfaction and health practices. Over the period 1987 to 2001 higher ideal body weights were recorded – for women it changed from 62.2 kg to 70.5 kg.⁹⁶ For a given body mass index, higher ideal body weights were associated with greater weight satisfaction but lower intentions to lose weight.⁹⁶ Body weight satisfaction was associated with greater walking/jogging, better diet, and lower lifetime weight loss but with less intention to change physical activity and diet or lose weight.⁹⁶ Conversely, body mass index was negatively associated with weight satisfaction and was associated with less walking/jogging, poorer diet, and greater lifetime weight loss but with greater intention to change physical activity and diet or lose weight.⁹⁶ Although the health implications of these findings are somewhat unclear, increased weight satisfaction, in conjunction with increases in societal overweight/obesity, may result in decreased motivation to lose weight and/or adopt healthier lifestyle behaviors.⁹⁶

Whether acceptance of body size irrespective of weight is health promoting or not remains controversial.

8.4 Health risks of public messages

In the paper *Evaluating the risk of harm of weight-related public messages*, the National Eating Disorders Collaboration (Australia) applies a framework that may be used to guide evaluation of risk for health promotion or public health programs.⁵⁷ It is based on three key principles and assumptions:

1. Campaigns and programs targeting eating-, physical activity-, and weight-related issues should aim to do no harm. *Obesity prevention and related interventions should not increase risk of disordered eating or eating disorders, and eating disorder prevention interventions should not increase risk of overweight and obesity.*

2. Obesity and eating disorders are not opposite ends of the same spectrum. *A common myth is that anorexia nervosa is “the opposite of” obesity. Although the weight status of these individuals may differ, eating disorders in general and*

overweight and obesity have more in common than commonly believed. They do not affect two separate populations per se.

3. Integrated, coordinated messages around obesity and eating disorders are possible. *Although further research is required, conceptually, the optimum path forward involves targeting shared risk and protective factors, and avoiding increasing risk of specific conditions.⁵⁷*

There are strong ethical considerations in the promotion of women's health in the intersection between food, eating behavior, body image, mental health and chronic disease. Differences in values about 'health' means there are competing and often conflicting health promotion messages. For example through a focus on a reduction in body size (using waist measurements for example), are the risks to women's mental health greater or lesser than risks to cardiovascular health in health promotion messages? An explicit ethical framework would assist in this kind of decision making.⁹⁷

Conclusion

This paper has highlighted some of the complexities of the relationship between food and women's health. Most women in Australia do not eat according to the recommended Dietary Guidelines and some groups of women are at particular risk of nutrient deficiency. Poor nutrition and excessive energy intake increase women's risk of a wide range of chronic disease, with cardiovascular disease being the number one killer of Australian women.⁷

Access to fresh, affordable food coupled with social support, influences women's diet. Inequity causes food insecurity and some groups of women are more disadvantaged when it comes to food access. Women with a disability for example may need additional physical or structural support to access a healthy diet.

While lower socio-economic status has a significant impact on women's access to a nutritious diet and risks of depression, anxiety, obesity and chronic disease, many other psychosocial factors are at play, for example women's emotional needs and food or eating-related behaviours. Disordered eating behaviours in young women can lead to longer term eating disorders, including patterns that lead to overweight and obesity. When promoting women's health behaviours we need to consider the risks of contributing to negative self perception and social stigma around body size as these are factors which in turn may contribute to disordered eating.

References

1. Guest J, Bilgin A, Pearce R, Baines S, Zeuschner C, Rossignol-Grant CL, et al. Evidence for under-nutrition in adolescent females using routine dieting practices. *Asia Pacific Journal of Clinical Nutrition*. 2010;19(4):526-33.
2. Burns C. A review of the literature describing the link between poverty, food insecurity and obesity with specific reference to Australia. Melbourne: VicHealth; 2004. [cited 12 September 2012]. Available from: <http://www.ana.org.nz/documents/CateBurnspovertyfoodsecurityandobesity.pdf>.
3. Burgard D. What is 'health at every size'? In: The fat studies reader. New York: New York University Press; 2009. p. 42-53.
4. Buxton BK. Body image and women: how does obesity fit into the picture? *Bariatric Nursing and Surgical Patient Care*. 2008;3(4):285-90.
5. Marino M, Masella R, Bulzomi P, Campesi I, Malorni W, Franconi F. Nutrition and human health from a sex-gender perspective. *Molecular Aspects Of Medicine*. 2011;32(1):1-70.
6. Urquhart CS, Mihalynuk TV. Disordered eating in women: implications for the obesity pandemic. *Canadian Journal of Dietetic Practice and Research*. 2011;72(1):50.
7. Australian Institute of Health and Welfare. Women and heart disease: cardiovascular profile of women in Australia. Canberra: Australian Institute of Health and Welfare; 2010. - (AIHW; Cat. no. CVD 49).
8. Victoria. Department of Health. The Victorian Health Monitor Food and Nutrition Report. Melbourne: Victoria. Department of Health; 2012. Available from: www.health.vic.gov.au/healthstatus/survey.
9. Victoria. Department of Health. The Victorian Health Monitor. Melbourne: Victoria. Department of Health; 2012. Available from: www.health.vic.gov.au/healthstatus/survey.
10. National Heart Foundation of Australia, Cardiac Society of Australia and New Zealand. Reducing risk in heart disease: an expert guide to clinical practice for secondary prevention of coronary heart disease. Melbourne: National Heart Foundation of Australia; 2012.
11. Haby M, Marwick A. Future prevalence of overweight and obesity in Australian children and adolescents, 2005-2025. Melbourne: Victoria. Department of Human Services; 2008. Available from: http://www.health.vic.gov.au/healthstatus/composite/future_obesity.htm.
12. Van der Merwe M. Obesity in women: a life cycle of medical risk. *Journal of Endocrinology, Metabolism and Diabetes of South Africa*. 2009;14(3):139-42.
13. Moran LJ, Dodd J, Nisenblat V, Norman RJ. Obesity and reproductive dysfunction in women. *Endocrinology and Metabolism Clinics of North America*. 2011;40(4):895-906.
14. Anderson AS. Nutrition interventions in women in low-income groups in the UK. *Proceedings of the Nutrition Society*. 2007;66(1):25-32.
15. Blumfield ML, Hure AJ, Macdonald-Wicks LK, Patterson AJ, Smith R, Collins CE. Disparities exist between national food group recommendations and the dietary intakes of women. *BMC Women's Health*. 2011;11:37.
16. Australia. Department of Health and Ageing. Healthy eating at various life stages: girls 14-18 years old. Canberra: Australia. Department of Health and Ageing; 2010. Available from: <http://www.healthysite.gov.au/internet/healthysite/publishing.nsf/Content/healthy-eating>.

17. Ivers LC, Cullen KA. Food insecurity: special considerations for women. *The American Journal Of Clinical Nutrition*. 2011;94(6):1740S-4S.
18. Szwajcer E, Hiddink GJ, Maas L, Koelen M, van Woerkum C. Nutrition awareness before and throughout different trimesters in pregnancy: a quantitative study among Dutch women. *Family Practice*. 2012;29 Suppl 1:i82-i8.
19. Wen LM, Flood VM, Simpson JM, et al. Dietary behaviours during pregnancy: findings from first-time mothers in southwest Sydney, Australia. *International Journal of Behavioral Nutrition and Physical Activity*. 2010;7(13):7. Available from: <http://www.ijbnpa.org/content/7/1/13>.
20. Davis SR. Why do women aged 40 and over need a different diet? What are their specific requirements and are they met? *Medical Journal of Australia*. 2000;173(Supplement):s95-s6.
21. Deakin University. Centre for Physical Activity and Nutrition Research. Health benefits of combining exercise and nutrition in ageing: from research to practice. *C-PAN Newsletter*. 2012;22(May):6.
22. Australia. Department of Health and Ageing. Healthy eating at various life stages: women 70+ years old. Canberra: Australia. Department of Health and Ageing; 2006. Available from: <http://www.healthyactive.gov.au/internet/healthyactive/publishing.nsf/Content/healthy-eating>.
23. Craig WJ. Health effects of vegan diets. *The American Journal Of Clinical Nutrition*. 2009;89(5):1627S-33S. Available from: <http://www.ajcn.org/content/89/5/1627S.abstract>.
24. Victoria. Department of Health. Nutrition: women's extra needs. Melbourne: Victoria. Department of Health; 2011. Available from: http://www.betterhealth.vic.gov.au/BHCV2/bhcArticles.nsf/pages/Nutrition_womens_extra_needs.
25. Australia. National Health and Medical Research Council. Nutrient reference values for Australia and New Zealand. Canberra: Australia. National Health and Medical Research Council; 2012. Available from: <http://www.nrv.gov.au/nutrients/vitamin%20c.htm>.
26. Bernstein AM, Bloom DE, Rosner BA, Franz M, Willett WC. Relation of food cost to healthfulness of diet among US women. *American Journal of Clinical Nutrition*. 2010;92(5):1197-203.
27. Mendelsohn ME, Karas RH. The protective effects of estrogen on the cardiovascular system. *New England Journal of Medicine*. 1999;340(23):1801-11. Available from: <http://www.nejm.org/doi/full/10.1056/NEJM199906103402306>.
28. Greene CM, Fernandez ML. The role of nutrition in the prevention of coronary heart disease in women of the developed world. *Asia Pacific Journal of Clinical Nutrition*. 2007;16(1):1-9.
29. Kuhn L. Women and heart disease in Victoria: Is there equity in care? : [Unpublished. Presented at Women, Equity and Heart Disease Forum, Melbourne]; 2012.
30. Reeves GK, Pirie K, Beral V, et al. Cancer incidence and mortality in relation to body mass index in the Million Women Study: cohort study. *British Medical Journal*. 2007;335(7630):Epub 1134 Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2099519/?tool=pubmed>.
31. Olsen CM, Nagle CM, Whiteman DC, et al. Body size and risk of epithelial ovarian and related cancers. *International Journal of Cancer*. 2008;123:450-6.
32. Cohen SS, Palmieri RT, Nyante SJ, Koralek DO, Kim S, Bradshaw P, et al. Obesity and screening for breast, cervical, and colorectal cancer in women: a review. *Cancer*. 2008;112(9):1892-904.
33. Puhl RM. Weight bias: a barrier to gynecologic care. *Medscape Public Health and Prevention*. 2010(731304):Epub. Available from: <http://www.medscape.com/viewarticle/731304>.

34. Bittman M. Occasional paper: recent changes in unpaid work. Canberra: Australian Bureau of Statistics, 1995. - ABS Cat no 41540
35. Inglis V, Ball K, Crawford D. Why do women of low socioeconomic status have poorer dietary behaviours than women of higher socioeconomic status?: a qualitative exploration. *Appetite*. 2005;45(3):334-43. Available from: <http://www.deakin.edu.au/dro/view/DU:30003101>.
36. Bava CM, Jaeger SR, Park J. Constraints upon food provisioning practices in 'busy' women's lives: trade-offs which demand convenience. *Appetite*. 2008;50(2-3):486-98.
37. Adams J, White M. Socio-economic and gender differences in nutritional content of foods advertised in popular UK weekly magazines. *European Journal of Public Health*. 2009;19(2):144-9.
38. McMahon A, Tapsell L, Williams P, Motion J, Jones SC. Food advertisements containing 'scientific' and 'lay person' keywords: responses from a sample of female Australian consumers. *Nutrition and Dietetics*. 2010;67(1):6-12.
39. Vue H, Degeneffe D, Reicks M. Need states based on eating occasions experienced by midlife women. *Journal Of Nutrition Education And Behavior*. 2008;40(6):378-84.
40. Pan W-H, Hsieh Y-T, Wahlqvist ML. Gender-specific roles and needs in food-health security. *Asia Pacific Journal of Clinical Nutrition*. 2009;18(4):642-6.
41. Crawford D, Ball K, Mishra G, Salmon J, Timperio A. Which food-related behaviours are associated with healthier intakes of fruits and vegetables among women? *Public Health Nutrition*. 2007;10(3):256-65.
42. Hunter W, McNaughton S, Crawford D, Ball K. Does food planning mediate the association between living arrangements and fruit and vegetable consumption among women aged 40 years and older? *Appetite*. 2010;54(3):533-7.
43. Otis N, Pelletier LG. Women's regulation styles for eating behaviors and outcomes: The mediating role of approach and avoidance food planning. *Motivation and Emotion*. 2008;32(1):55-67.
44. Welch N, McNaughton SA, Hunter W, et al. Is the perception of time pressure a barrier to healthy eating and physical activity among women? *Public Health Nutrition*. 2009 July 2009;12(7):888-95.
45. Abrahams SF. Dieting, body weight, body image and self-esteem in young women: doctors' dilemmas. *Medical Journal of Australia*. 2003;178(12):607-11. Available from: http://www.mja.com.au/public/issues/178_12_160603/abr10855_fm.html.
46. Wade TD, Wilksch SM, Lee C. A longitudinal investigation of the impact of disordered eating on young women's quality of life. *Health Psychology*. 2012;31(3):352-9.
47. López-Guimerà G, Levine MP, Sánchez-Carracedo D, Fauquet J. Influence of mass media on body image and eating disordered attitudes and behaviors in females: a review of effects and processes. *Media Psychology*. 2010;13(4):387-416.
48. Mann S, Harmer H. Can health and wellbeing come in all shapes and sizes? Dieting: The Big Con. a harm minimisation program. *Australian Journal of Primary Health*. 2002;8(2):39-47.
49. Carraca EV, Silva MN, Markland D, et al. Body image change and improved eating self-regulation in a weight management intervention in women. *International Journal of Behavioral Nutrition and Physical Activity*. 2011;8(75):33 p. Available from: <http://www.ijbnpa.org/content/8/1/75/abstract>.

50. Morrison TG, Sheahan EE. Gender-related discourses as mediators in the association between internalization of the thin-body ideal and indicators of body dissatisfaction and disordered eating. *Psychology of Women Quarterly*. 2009;33(4):374-83.
51. Costarelli V, Demerzi M, Stamou D. Disordered eating attitudes in relation to body image and emotional intelligence in young women. *Journal of Human Nutrition and Dietetics*. 2009;22(3):239-45.
52. Shouse SH, Nilsson J. Self-silencing, emotional awareness, and eating behaviors in college women. *Psychology of Women Quarterly*. 2011;35(3):451-7.
53. Mond JM, Hay PJ, Rodgers B, Owen C. Mental health impairment associated with eating-disorder features in a community sample of women. *Journal Of Mental Health (Abingdon, England)*. 2011;20(5):456-66.
54. Ball K, Lee C. Psychological stress, coping, and symptoms of disordered eating in a community sample of young Australian women. *International Journal of Eating Disorders*. 2002;31:71-81.
55. Hirth JM, Rahman M, Berenson AB. The association of posttraumatic stress disorder with fast food consumption and unhealthy weight loss behaviors among young women. *Journal of Women's Health*. 2011;20(8):1141-9.
56. Brewerton TD. Posttraumatic stress disorder and disordered eating: food addiction as self-medication. *Journal of Women's Health*. 2011;20(8):1133-4. Available from: <http://www.liebertonline.com/doi/abs/10.1089/jwh.2011.3050>.
57. National Eating Disorders Collaboration. Evaluating the risk of harm of weight-related public messages. Crows Nest, N.S.W.: National Eating Disorders Collaboration; 2011. Available from: http://www.nedc.com.au/files/pdfs/Evaluating%20the%20Risk%20of%20Harm_final.pdf.
58. Australian Institute of Health and Welfare. Young Australians: their health and wellbeing 2007. Canberra: Australian Institute of Health and Welfare; 2007. - (AIHW; Cat. no. PHE 87). Available from: <http://www.aihw.gov.au/publication-detail/?id=6442467991>.
59. Patton GC, Selzer R, Coffey C, Carlin JB, Wolfe R. Onset of adolescent eating disorders: population based cohort study over 3 years. *British Medical Journal*. 1999;318(7186):765-8.
60. Wade TD, Bergin JL, Tiggemann M, Bulik CM, Fairburn CG. Prevalence and long-term course of lifetime eating disorders in an adult Australian twin cohort. *Australian and New Zealand Journal of Psychiatry*. 2006;40(2):121-8. Available from: <http://dx.doi.org/10.1111/j.1440-1614.2006.01758.x>.
61. Evans EJ, Hay PJ, Mond J, Paxton SJ, Quirk F, Rodgers B, et al. Barriers to help-seeking in young women with eating disorders: a qualitative exploration in a longitudinal community survey. *Eating Disorders*. 2011;19(3):270-85.
62. Jacka FN, Pasco JA, Mykletun A. Association of Western and traditional diets with depression and anxiety in women. *American Journal of Psychiatry*. 2010;167(3):305-11. Available from: <http://ajp.psychiatryonline.org/cgi/reprint/167/3/305>.
63. Crawford GB, Khedkar A, Flaws JA, Sorkin JD, Gallicchio L. Depressive symptoms and self-reported fast-food intake in midlife women. *Preventive Medicine*. 2011;52(3-4):254-7.
64. Jeffery RW, Linde JA, Simon GE, Ludman EJ, Rohde P, Ichikawa LE, et al. Reported food choices in older women in relation to body mass index and depressive symptoms. *Appetite*. 2009;52(1):238-40.
65. Ball K, Crawford D, Salmon J, Timperio A, Giles-Corti B, Mishra G. Socioeconomic and neighbourhood inequalities in women's physical activity, diet and obesity: The SESAW Study. Burwood, Vic.: Deakin University. Centre for Physical Activity and Nutrition Research; [2008].

- [cited 12 September 2012]. Available from: http://www.deakin.edu.au/health/cpan/behavioural-epide/SESAW_key_findings.pdf.
66. Australian Institute of Health and Welfare. Australia's food and nutrition 2012. Canberra: Australian Institute of Health and Welfare; 2012. - (AIHW; Cat. no. PHE 163). Available from: <http://www.aihw.gov.au/publication-detail/?id=10737422319&tab=2>.
 67. Lockie S, Pietsch J. Public Opinion on Food Security. Canberra: Australian National University College of Arts and Social Sciences; 2012. Available from: http://lyceum.anu.edu.au/wp-content/blogs/3/uploads//Food%20Security_Poll.pdf.
 68. Carter KN, Lanumata T, Kruse K, Gorton D. What are the determinants of food insecurity in New Zealand and does this differ for males and females? *Australian and New Zealand Journal of Public Health*. 2010;34(6):602-8.
 69. Olson CM, Strawderman MS. The relationship between food insecurity and obesity in rural childbearing women. *The Journal Of Rural Health*. 2008;24(1):60-6.
 70. Vinkeles Melchers N, Gomez M, Colagiuri R. Do socio-economic factors influence supermarket content and shoppers' purchases? *Health Promotion Journal of Australia*. 2009;20(3):241-6. Available from: http://www.menzieshealthpolicy.edu.au/other_tops/pdfs_pubs/hpjadec09.pdf.
 71. Hume C, Ball K, Crawford D, McNaughton S, Stephens L. Why do some women of low socioeconomic position eat better than others. Burwood, Vic.: Deakin University. Centre for Physical Activity and Nutrition Research; 2009. - (Centre for Physical Activity and Nutrition Research Summary Report.
 72. Kettings C, Sinclair AJ, Voevodin M. A healthy diet consistent with Australian health recommendations is too expensive for welfare-dependent families. *Australian and New Zealand Journal of Public Health*. 2009;33(6):566-72.
 73. Palermo CE, Walker KZ, Hill P, et al. The cost of healthy food in rural Victoria. *Rural and Remote Health*. 2008 2008;8(1074):9. Available from: <http://www.rrh.org.au/articles/showarticlenew.asp?ArticleID=1074>.
 74. Burns CM, Inglis AD. Measuring food access in Melbourne: access to healthy and fast foods by car, bus and foot in an urban municipality in Melbourne. *Health and Place*. 2007;13(4):877-85. Available from: <http://www.sciencedirect.com/science/article/pii/S1353829207000263>.
 75. Coveney J, O'Dwyer LA. Effects of mobility and location on food access. *Health and Place*. 2009;15(1):45-55. Available from: <http://www.sciencedirect.com/science/article/pii/S1353829208000178>.
 76. McDowell A, Bond M. Body image differences among Malay, Samoan, and Australian women. *Asia Pacific Journal of Clinical Nutrition*. 2006;15(2):201-7.
 77. Lawrence JM, Devlin E, Macaskill S, Kelly M, Chinouya M, Raats MM, et al. Factors that affect the food choices made by girls and young women, from minority ethnic groups, living in the UK. *Journal of Human Nutrition and Dietetics*. 2007;20(4):311-9.
 78. Hall L, Colantonio A, Yoshida K. Barriers to nutrition as a health promotion practice for women with disabilities. *International Journal of Rehabilitation Research*. 2003;26:245-7.
 79. Nosek MA, Hughes RB, Robinson-Whelen S, et al. Physical activity and nutritional behaviors of women with physical disabilities: physical psychological, social, and environmental influences. *Women's Health Issues*. 2007;16(6):323-33.
 80. Rimmer JH, Yamaki K. Obesity and intellectual disability. *Mental Retardation and Developmental Disabilities Research Reviews*. 2006;12(1):22-7. Available from: <http://dx.doi.org/10.1002/mrdd.20091>.

81. Stewart L, Beange H, Mackerras D. A survey of dietary problems of adults with learning disabilities in the community. *Mental Handicap Research*. 1994;7(1):41-50. Available from: <http://dx.doi.org/10.1111/j.1468-3148.1994.tb00115.x>.
82. Australian Bureau of Statistics. The health and welfare of Australia's Aboriginal and Torres Strait Islander peoples, Oct 2010 Canberra: Australian Bureau of Statistics; 2010. - (ABS Cat; 4704.0). Available from: <http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/4704.0Main+Features1Oct%202010?OpenDocument>.
83. Thorpe S, Browne J. Closing the nutrition and physical activity gap in Victoria: Victorian Aboriginal nutrition and physical activity strategy. Melbourne: Victorian Aboriginal Community Controlled Health Organisation; 2009. Available from: <http://www.vaccho.org.au/vcwp/wp-content/uploads/2011/03/VANPHS.pdf>.
84. Thompson SJ, Gifford SM. Trying to keep a balance: the meaning of health and diabetes in an urban Aboriginal community. *Social Science and Medicine*. 2000;51(10):1457-72. Available from: <http://www.sciencedirect.com/science/article/pii/S0277953600000460>.
85. Foley W. Family food work: lessons learned from urban Aboriginal women about nutrition promotion. *Australian Journal of Primary Health*. 2010;16(3):268-74. Available from: <http://www.publish.csiro.au/nid/261/paper/PY10004.htm>.
86. O'Hara L, Gregg J. The war on obesity: a social determinant of health. *Health Promotion Journal of Australia*. 2006;17(3):260-3.
87. Access Economics Pty Ltd. The growing cost of obesity in 2008: three years on. Canberra: Diabetes Australia; 2008. Available from: <https://www.diabetesaustralia.com.au/en/Resources/Reports/>.
88. Lewis S, Thomas SL, Blood RW, Castle DJ, Hyde J, Komesaroff PA. How do obese individuals perceive and respond to the different types of obesity stigma that they encounter in their daily lives? a qualitative study. *Social Science and Medicine*. 2011;73(9):1349-56.
89. Schupp HT, Renner B. The implicit nature of the anti-fat bias. *Frontiers in Human Neuroscience*. 2011;5(Article 23):11 p. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3051268/?tool=pubmed>.
90. Watts K, Cranney J. The nature and implications of implicit weight bias. *Current Psychiatry Reviews*. 2009;5(2):110-26.
91. Egger GJ. A big-picture approach to big people [Letter to the Editor]. *Medical Journal of Australia*. 2012;9(21 May):567.
92. Turner L. Everyone knows obesity kills, but is weight loss the answer? *On Line Opinion*. 2012(3 May). Available from: <http://www.onlineopinion.com.au/view.asp?article=13576>.
93. Thomas SL, Lewis S, Hyde J, Castle D, Komesaroff P. The solution needs to be complex: obese adults' attitudes about the effectiveness of individual and population based interventions for obesity. *BMC Public Health*. 2010;10(Article 420):9 p. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2912819/>.
94. Dickins M, Thomas SL, King B, Lewis S, Holland K. The role of the fatosphere in fat adults' responses to obesity stigma: a model of empowerment without a focus on weight loss. *Qualitative Health Research*. 2011;21(12):1679-91.
95. Padigan C. About: welcome to Big Fat Blog. [place unknown]: Big Fat Blog; 2012. Available from: <http://www.bigfatblog.com/about>

96. Kuk JL, Ardern CI, Church TS, Hebert JR, Sui X, Blair SN. Ideal weight and weight satisfaction: association with health practices. *American Journal of Epidemiology*. 2009;170(4):456-63.
97. Fry CL. Ethical issues in obesity interventions for populations. *NSW Public Health Bulletin*. 2012;23(5-6):116-9. Available from: <http://www.publish.csiro.au/paper/NB12062.htm>.