

Prevention of dieting disorders: screening and preventive intervention (the NHMRC initiative)

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Recommendation

Screening school-aged children, adolescents and women in their 20s and 30s for frank eating or dieting disorders, and for disordered attitudes and behaviours with respect to weight, shape and food, would provide demographic information of value in planning clinical services in Australia. There is a possibility, however, that screening of a vulnerable population may inadvertently encourage unhealthy eating attitudes and practices, and hence contribute to the occurrence of these illnesses. Furthermore, effective means of preventive intervention for persons identified by such screening have not yet been devised. For these reasons, screening for dieting disorders is not recommended at this time except as a research tool.

On the other hand, screening of dieting disorder patients for serious medical complications is imperative. These illnesses have a high mortality rate and are associated with wide ranging physical morbidity. An unfortunate consequence of the increasing role of non-medical health professions in their management is the danger that these complications will escape recognition. It is important that all doctors, and all other professionals dealing with these patients, are made aware of the need to ensure that they are properly investigated and treated.

Specifically:

- Screening in at-risk groups is appropriate, by *primary health care medical practitioners*.
- Screening should entail a knowledge of *family members and their relationships*; regular recording of subjects' *weights and heights* (a follow-on from documentation about growth and development); enquiry about general health and well-being, which may reveal *warning signs* for Anorexia Nervosa or Bulimia Nervosa; enquiry about *menstruation* in young women; enquiry about *physical activity*; awareness of involvement in *elite sports, or dance*.
- Inclusion of an "eating disorder" component in *National Nutrition Surveillance and Monitoring programmes*.

- *Implementation of School-Based and Tertiary Education Based Health Education programmes* that address the problem constructively.
- *Public Awareness* campaigns, which avoid being alarmist.
- *Liaison with Advertising and Fashion Industry*.
- *Codes of Practice for Weight Loss Industry* which acknowledge At-Risk groups¹.
- That there be goals and targets for screening and prevention of eating disorders.

Definition

AN (anorexia nervosa) is a condition of severe, self-induced undernutrition which usually first arises in adolescent girls and young women. The diagnostic criteria applied will determine the prevalence of eating disorders. Anorexia Nervosa (AN) or Bulimia Nervosa (BN) can be diagnosed according to American Psychiatric Assessment Criteria DSM-IV².

1. For anorexia nervosa

The diagnostic criteria are:

- A. Refusal to maintain body weight at or above a minimally normal weight for age and height (eg. weight loss leading to maintenance of body weight less than 85% of that expected, or failure to make expected weight gain during period of growth, leading to body weight less than 85% of that expected).
- B. Intense fear of gaining weight or becoming fat, even though under-weight.
- C. Disturbance in the way in which one's body weight or shape is experienced, undue influence of body weight or shape on self-evaluation, or denial of the seriousness of the current low body weight.
- D. In postmenarcheal females, amenorrhoea, ie. the absence of at least three consecutive menstrual cycles. (A woman is considered to have amenorrhoea if her periods occur only following hormone, eg. oestrogen, administration).

A report to the National Health and Medical Research Council (NHMRC) of Australia for its preventive health strategies

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Specify type:

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

2. For bulimia nervosa

The diagnostic criteria are:

- A. Recurrent episodes of binge eating. An episode of binge eating is characterised by both of the following:
- (1) eating, in a discrete period of time (eg. within any 2-hour period), an amount of food that is definitely larger than most people would eat during a similar period of time and under similar circumstances
 - (2) a sense of lack of control over eating during the episode (eg. a feeling that one cannot stop eating or control what or how much one is eating)
- B. Recurrent inappropriate compensatory behaviour in order to prevent weight gain, such as self-induced vomiting, misuse of laxatives, diuretics, enemas, or other medications, fasting, or excessive exercise.
- C. The binge eating and inappropriate compensatory behaviours both occur on average, at least twice a week for 3 months.
- D. Self-evaluation is unduly influenced by body shape and weight.
- E. The disturbance does not occur exclusively during episodes of Anorexia Nervosa.

Specify type:

- *Purging type:* during the current episode of Bulimia Nervosa, the person has regularly engaged in self-induced vomiting or the misuse of laxatives, diuretics, or enemas.
- *Non purging type:* during the current episode of Bulimia Nervosa, the person has used other inappropriate compensatory behaviours, such as fasting or excessive exercise, but has not regularly engaged in self-induced vomiting or the misuse of laxatives, diuretics, or enemas.

It should be noted that there is now increasing use of BMI (body mass index) $<17.5 \text{ kg/m}^2$ as an adjunctive criterion for Anorexia Nervosa; <17.0 represents grade 2 chronic energy undernutrition by current WHO criteria, where <18.5 is grade 1 and <16.0 is grade 3³.

This weight loss may be achieved solely by excessive dieting and exercising (restrictive form) or by the further use of self-induced vomiting and laxative abuse (purging form)⁴.

BN (bulimia nervosa) is a closely related but less serious illness in which persons of normal weight (usually young women) have a chaotic eating pattern, alternating between rigid restriction and episodes of disinhibited gorging or binge eating⁵. Most bulimia patients also use purging behaviours to prevent weight gain. Because the diagnostic criteria in both the ICD⁶ and DSM⁷ systems are inappropriately strict, up to a third of patients who present are included in neither diagnosis: their weight loss is not sufficiently severe, or their bulimic episodes are less frequent than stipulated, or they have a concomitant problem of being overweight⁸. Such cases are classed as ED-NOS (Eating Disorders Not Otherwise Specified). A major feature of all these illnesses is inappropriate and excessive

weight-losing behaviours, hence they are better termed dieting disorders than eating disorders.

Thus the problem, from a preventive point of view, and from the point of view of societal-wide eating disorder morbidity, is that there are undoubtedly many more people with lesser degrees of eating disorder than AN or BN; these are important in their own right, and with potential to assume more serious proportions⁹. Some indication of this comes from the work of Abraham and Llewellyn-Jones¹⁰ reported in 1986 amongst students in Sydney.

Table 1. Subject's opinion about eating problems.

Eating problem	Percent who respond 'yes'
Eating disorder- ever	22.6%
Eating disorder- current	11.2%
Obsessed with food and eating - ever	32.1%
Obsessed with food and eating - current	21.9%
Difficulty feeling in control around food	45.0%

From Abraham and Llewellyn-Jones¹⁰

Epidemiology and course

A definitive study from the USA found an annual incidence of 8.2/ 100,000 and a point prevalence of 0.48% for AN¹¹. It was the third most common chronic illness in girls aged 15-19 years, after only obesity and asthma, and five times as common as IDDM. Similar figures have been reported in several European studies. An alarming recent development is an increased occurrence in prepubertal children¹². BN is associated with a slightly older age group, affecting mainly young women in their late teens and early to mid twenties. Its epidemiology has been less clearly documented, but currently it is certainly more common than AN. A Sydney study reported a prevalence of more than 4% in girls and young women¹³. It may be as high as 5-10% in young women¹⁴, according to the Victorian Health Promotion Foundation (VHPF) reports from its working party on Eating Disorders.

Only about 5% of dieting disorder patients are male^{15,16}. The female preponderance is less marked in the very young age group: 30% of patients aged 10-14 years are male¹².

The problem of *representativeness* of sample must be considered. Most studies have concentrated on presumed at-risk groups so that community-wide prevalences are less available (Table 2).

Table 2. Eating disorder prevalence.

Occupational group	Anorexia nervosa	Bulimia
Secondary school students (<i>private college</i>)	0.009%	3.2%
Secondary school students (<i>state</i>)	0.0%	3.8%
University students	0.0%	2.8%
Technical college students	0.0%	1.4%
Nursing students	0.0%	8.6%
College of advanced education students	1.1%	3.2%
Clerical workers	0.0%	4.8%

From Abraham and Llewellyn-Jones¹⁰.

Some indication of the potential prevalence for Eating Disorders comes from the present *desire of most Australian young women to lose weight*, no matter what their present weight for height relationship¹⁷.

This *focus on weight* has become a particular problem since it is not necessarily "fatness", let alone fat distributed in an unhealthy way (ie. abdominal). It also does not acknowledge individual difference in susceptibility to health problems from overfatness. Where weight (or, now, BMI) is

used as a diagnostic criterion, account should be taken of its limitations in the assessment of fat and fat free mass (FFM). Indeed, a shift in diagnostic and management domain towards body composition (measured even simply by anthropometric techniques of circumferences and skinfold) and away from weight would probably diminish the overall problem of eating disorders.

The extent to which eating disorders are an *indicator of underlying social or behavioural problems*, where a primary focus is required, needs reflection. If we were to prevent eating disorders, would these underlying problems manifest in other ways? Would these other ways be less individually harmful? We do not have the answers to these questions. In all likelihood, life long morbidity in eating and body composition develops when the relationship and identity crises of adolescence ought to resolve themselves, but do not because of the current pressures to overeat, and to conform to unrealistic body shapes and sizes. The diagnostic process, and therefore statements about prevalence, need always to make reference to the prevailing food and fashion environment and culture.

The average *duration of illness* for AN is long at 4-5 years, with a range of 3 to 9 years¹⁸⁻²⁰. A number of overseas studies suggest that approximately 75% of patients recover, but many of these "cured" cases have residual problems with eating attitudes and behaviours²¹. The short term death rate has been reported as high as 10%²², but is undoubtedly far lower when intensive care facilities and expertise in management are available. In general, treatment in a specialised unit is associated with better outcome than treatment in a general ward^{23,24}. Nevertheless, the long-term mortality rate at 20 years has been estimated at about 20%^{25,26}, the major causes of death being cardiac arrhythmia, related to electrolyte imbalance, and suicide. In patients who survive but have continued AN at longterm follow-up, there is a high likelihood of comorbid psychiatric symptoms²⁷, as well as of chronic medical complications such as impaired fertility, growth retardation, osteoporosis, cathartic colon, rectal prolapse and brain changes²⁸.

Treatment studies of BN generally report a favourable response in 50-70% of cases, but many patients relapse and little is known about the longterm outcome of this illness²⁹. It is likely that the better nutrition and higher body weights in BN protect against such medical complications as osteoporosis, and that BN is associated with a far lower mortality rate than AN.

Burden of illness

In New Zealand, patients with AN occupy one-tenth as many hospital beds as those suffering from schizophrenia³⁰. Forty-three percent are known to have relapsed and to have required one or more further admissions within 5 years of their first hospitalisation. In NSW, the average annual admission rate for AN is 7.2 per 100,000³¹. Many of these are brief admissions for the investigation or correction of medical complications. Patients who go to specialised public or private units for treatment have a mean duration of stay of about 64 days, similar to that in New Zealand. At least one life-threatening medical complication was noted in 11% and at least one clinically significant abnormality in a further 21% of patients at the specialised unit in a Sydney teaching hospital which took the major load of these admissions. Despite these statistics, AN is not even mentioned in the influential Tolkein Report³² or in the Resources Allocation Formula³³.

BN patients and those with milder forms of dieting disorder (ED NOS) are usually treated as outpatients. No data

are available documenting the load these patients place on clinical services.

At-risk population

It has been reported that 60% of adolescent girls engage in deliberate weight losing behaviours^{34,35}, and these behaviours are becoming common in prepubertal children as well. The majority of girls aged 10-14 years surveyed by Childress *et al*³⁶ admitted to body dissatisfaction related to feeling fat. Restrained eating in adolescents and young women is so common as to be regarded generally as normal female eating behaviour³⁷. Yet it is from such behaviour that both AN and BN develop. Members of particular groups within the community, who are subjected to a high level of pressure to be excessively thin, such as gymnasts, ballet dancers, athletes and models, are known to be particularly vulnerable to developing an eating disorder.

Notwithstanding the need and value of representative population-based data in the field of eating disorders, eating disorders are most clinically in evidence in sub-groups.

1. Young women

Risk factors in young women themselves may be several³⁸. The peer group pressures and behaviours of certain groups of young women, and the role of the group leader may be particularly important in the determination of eating disorders. It is becoming clear that, with a "successful bulimic" in a group, this behaviour can become dominant in the group. Such group phenomena have been observed amongst school girls and University students, even medical students. There are implications here for how the problem needs to be approached - and some analogues with smoking amongst young women (which, in any case, may be part of the weight reduction pathology). A screening strategy to identify group leaders and their behaviours in schools may be worthwhile. Of particular importance will be the need to impart information about normal eating behaviours and their range³⁹ - it is normal to feel hungry, and to eat more and less from time to time; this is not necessarily bingeing; regular and modest levels of physical activity help regulate appetite in a way appropriate to energy needs.

2. Sports people

Although food composition studies with non-sports people are not available, most indications are that the prevalence of eating disorders is higher in this group^{40,41}.

3. Dancers

Attention has been drawn to the high prevalence of eating disorders amongst male and female dancers, especially ballet dancers^{42,43}. In the Abraham and Mason⁴⁴ study 59% of dancers considered themselves to be preoccupied with thoughts of food and eating and to have experienced an episode of disordered eating. This raises as many questions for the teachers and spectators as it does for the dancers.

How necessary is the spectacle of dance with waif-like performers?

4. Jockeys

Jockeys merit special consideration as weight, not weight/height limits to race are set by the industry, and these mainly affect males. Quite extreme measures are used to weigh in (eg. restricted fluid intake to 500 ml/day, jogging in sweat suits, saunas, diuretics) placing jockeys at risk of dehydration and collapse and pre-renal failure. As jockeys get taller by the

generation, no or little adjustment is being made in weight criteria⁴⁴.

5. The aged

Data on this group presently relate more to disordered eating rather than established eating disorders, but this latter group is probably under-recognised.

Preliminary observations in a representative sample of Anglo-Celtic over 70 year olds in Melbourne indicate inappropriate sense of need for weight change amongst older men and women¹⁷. Although overfatness can contribute to health problems in the aged, loss of lean mass is of great overall concern⁴⁵ with increased morbidity due to reduced strength⁴⁶ and increased mortality⁴⁵ and due to immuno-deficiency⁴⁷.

Case studies (Clarke, Rassios and Wahlqvist, Personal Communication) reveal certain *themes in disordered eating amongst the aged*:

- (1) prolongation of a minor eating disorder from earlier life in a now more nutritionally vulnerable individual (eg. fastidiousness, food avoidance, concern about weight)
- (2) preoccupation with the major morbidities and mortalities of later life, from a nutritional point of view. For example:
 - avoidance of meat and dairy products to reduce the risk of coronary heart disease
 - veganism to avoid cancer
- (3) social isolation with effects on food supply and decreased interest in food preparation and eating
- (4) physical handicap affecting (a) food preparation and ingestion and (b) toilet functions - urination and defecation where manipulating food intake is used as a means to handle the problem perceived to be of greater consequence, and where this becomes a fixed behaviour
- (5) emotional and relationship difficulties, where eating is used to control the situation (as with eating disorders in the young)
- (6) impaired cognitive function and dementia with consequences for eating behaviour and related aspects of self-care.

6. Asians

New concerns are emerging about ethnic difference⁴⁸, especially amongst Asians, in the pathogenesis and prevalence of eating disorders. Chinese Australian women are now saying that there are undue pressures on them to look thin in accordance with the stereotype. Women in transitional food and exercise cultures may be at particular risk where childhood stunting has occurred, when later life exposure to food abundance occurs, and abdominal obesity is more likely⁴⁹. This constitutes a real health problem, which will place undue eating and exercise demands on immigrant Asian women to Australia.

Unfortunately, there is a paucity of good epidemiological data which are both community-wide and group specific, and which may need to begin in childhood⁵⁰. This needs to be rectified as a matter of public health and preventive medicine priority. There is a case to be made for combined and prospective studies of underweight and obesity, given the common factors which may underlie these disorders⁵¹. But, in the meantime, screening and early intervention is appropriate. Most important is to avoid the "institutionalisation" of those with eating disorders, because, at that point, presumably because of both the advanced stage and also the management methods, the condition is likely to be long-lasting and entrenched⁵².

Screening

Simple measures of height and weight allow for the calculation of BMI. The normal range for females older than 16 years is 20-25. A BMI of 17.5 or less in the absence of other severe medical illness is highly suggestive of AN. In younger children, the BMI is not reliable, and recourse should be made to paediatric height and weight tables. Tanner's charts may be consulted, but they are somewhat dated and are based on overseas samples which are not really appropriate. Fortunately, detailed data are now available for young Australians⁵³. Where the weight is less than 80% of that appropriate for the height percentile⁵⁴, AN should be suspected, as it should be also in patients who are growth retarded (below the third percentile). Clinical parameters which are associated with undernutrition in AN are bradycardia, hypothermia, hypotension, acrocyanosis, lanugo hair, dehydration and ketotic halitosis. Amenorrhoea with anovulatory infertility is almost invariable unless disguised by taking an oral contraceptive.

A disturbance of biochemistry may be the presenting feature in dieting disorder patients (AN, BN or ED-NOS) who, as is often the case, are unwilling to disclose the existence of their behavioural disorder to their medical attendants. High urea and creatinine, and low blood sugar are indicative of starvation; hypokalemia, which also may result from starvation, is more commonly associated with self induced vomiting, as is a high level of serum amylase; laxative abuse may result in a hyperchloremic acidosis. Transferrin and retinol binding prealbumin are sensitive indicators of nutritional deprivation, while haematological parameters indicative of undernutrition include moderate anaemia (normocytic or microcytic), particularly in patients who are vegetarian or who take an oral contraceptive pill and would otherwise be amenorrhoeic, low white cell counts with neutropenia, and a reduction of the platelet count.

There are a number of psychological instruments that are useful in screening for dieting disorders, the best known of which are the EAT⁵⁵ and the EDI⁵⁶. The EAT (Eating Attitudes Test) is a standard, empirically derived measure of anorexia symptoms, designed to evaluate a broad range of the behaviours and attitudes found in AN patients. The EDI (Eating Disorders Inventory), on the other hand, is a deductively derived scale that measures those cognitive and behavioural dimensions that are believed to constitute the specific psychopathology of AN and BN. The KEDS (Kids' Eating Disorder Schedule) is a newly developed self report instrument designed for use in children and younger adolescents³⁶. These various instruments are not diagnostic and should be employed in combination with surveys of height and weight, eating and weight losing behaviours when screening populations or assessing the progress of preventive interventions.

Preventive intervention

There are two major forms of preventive intervention:

- (1) Primary, aimed at preventing the occurrence of illness in normal, ostensibly asymptomatic persons at risk, eg school-age children and adolescents, particularly athletes and ballet and gymnastics students;
- (2) Secondary, aimed at recognising and treating early cases, reducing harm, accelerating recovery, diagnosing complications and preventing chronicity in patients suffering from frank illness.

Relating to the first of these categories are a number of studies, in school and college populations⁵⁷⁻⁵⁹ and in ballet schools⁶⁰, in which the authors assessed disordered eating attitudes and

other personal attributes; administered an intervention which usually involved educational, experiential and counselling components; and then reassessed the subjects using the same instruments. Although these overseas studies were alleged to show a benefit from intervention, a more recent Australian investigation, which followed the same principles in applying a five week educational programme, reported no discernible changes in attitudes or dieting behaviours in adolescent school girls⁶¹.

Other approaches to primary prevention are public awareness campaigns, public education and attempts to modify illness-provoking messages conveyed in the media. The experience with anti-smoking campaigns and "Just Say No To Drugs" programme for adolescents suggests that these may easily backfire⁶², increasing rather than diminishing the target behaviour and reducing anxiety about it. Problems arise from a failure to appreciate certain elements of the teenage psyche as well as from inherent hypocrisy in the choice of role models.

Dieting disordered patients often attribute their repertoire of weight-losing behaviours to knowledge gained from the media. In general, the media convey many messages that are calculated to increase body dissatisfaction among young women, and as a consequence such dissatisfaction is uniformly high in patients and controls. Unfortunately, this ploy is profitable for the purveyors of fashion, cosmetics, health foods and exercise programmes⁶³, and hence there would be strong resistance to any attempt to ban it.

Schools and school counsellors might be expected to play an important role in assisting schoolchildren to resist societal pressures and to instil good nutritional practices⁶³. Unfortunately, staff are often poorly educated in these matters, and unhealthy rather than healthy eating practices and attitudes are promoted. The NSW Department of Education has recently tried to address the issue by devising a special curriculum to be taught in the schools⁶⁴, but this initiative appears to have foundered. It has been criticised for not including the views of clinicians with expertise in the area; for inaccuracies in some of the information it provided; and for the highly polarised opinions of its designers.

Although primary preventive initiatives in younger subjects have been disappointing, success has been reported for the "undiating" groups described by Polivy and Herman⁶⁵. These groups target older women, some of whom have potential or even current dieting disordered daughters. Media presentations, through newspapers, magazines, books, film and television, concerning nutrition, health and dieting disorders directed at this older age group appear to exert a positive and far-reaching effect, assisting these women to recognise or prevent the problem in their daughters or other associates.

The secondary prevention category includes studies of changes in standardised mortality rates as a result of treatment. At least one such study has been undertaken: Crisp *et al*²⁴ demonstrated a twofold reduction in mortality rate over 20 years in patients treated in a specialised unit.

The earlier recognition of dieting disorders might be expected to permit earlier and more effective intervention⁶⁶. This would require better education of those who deliver primary health care, eg general practitioners, nurses, dietitians, dentists; more attention to the problem of dieting disorders in the curricula of medical schools and other institutions training health workers; and greater cooperation with teachers and school counsellors.

Treatment must be made more acceptable to patients. Proven initiatives here include lenient rather than strict behavioural programmes, which have been shown to be equally effective in promoting weight gain⁶⁷, and the

incorporation of exercise rewards, which contrary to prediction, do not prevent patients from gaining weight⁶⁸. Day programme alternatives and weekend treatment options are currently being explored, utilising principles of behavioural management and psychotherapy and providing care in a less restrictive setting.

Because of the serious physical risks associated with dieting disorders, particularly the purging form of AN, these patients must be adequately investigated for medical complications. A full electrolyte profile (including potassium, magnesium, calcium and phosphates), random glucose, full blood count, blood protein and albumin, liver and renal functions are mandatory⁶⁹. So is an ECG, because of the possibility of extreme bradycardia and life-threatening arrhythmias^{70,71}. Holter monitors are useful in those instances where a full cardiovascular assessment is indicated. As osteoporosis is a common sequelae⁷², all patients with a history of amenorrhoea of more than one year should be subjected to densitometry, preferably by DEXA. Those in whom severe osteopenia is confirmed must be considered for hormone replacement therapy with low dose oestrogen and progesterone. Pelvic ultrasound for uterine size and ovarian activity is useful in monitoring reproductive status before and after treatment⁷³. Radiological bone age is indicated for patients in whom growth retardation is suspected. Impairment of renal function should also be documented. It may be corrected by cessation of weight-losing behaviours as well as by weight gain per se⁷⁴.

Total body protein in the acute situation correlates highly with weight and both are proportionally repleted during refeeding⁷⁵. In chronic patients, however, total body protein provides a valuable index of severity⁷⁶. Because protein repletion in AN is entirely dependent on weight restoration^{75,76}, the patient's nutritional status must be normalised. Both the resumption of linear growth⁷⁷ and normalisation of bone density⁷⁸ require protein restoration. Return to premorbid levels of weight appears to be necessary for full protein repletion.

Pharmacological therapy

There is no proven pharmacological therapy for eating disorders, although associated depression may be so managed. There is interest in appetite stimulants^{69,79-81}.

Non-pharmacological therapy

This is the main-stay, but is presently largely behavioural, with weight gain as the rewarded achievement. Whilst this may be appropriate in advanced cases, it is unlikely to be so early on when primary psychological contributors can be addressed, and when attitudes to food and fashion can be reshaped. Little effort is being made to provide controlled studies of different non-pharmacological interventions, without weight as an end point (weight has, after all, been an inappropriate focus for the patient, and becomes so for health practitioners)

Quality of the evidence

The epidemiology, course and complications of AN have been well documented, although limited in representativeness; the importance of adequate screening for major medical complications is undoubted, but its evaluation is in an early stage of development. Information about BN is less reliable, partly because there have been major changes in the diagnostic criteria over the last 10 years, leading to confusion in the literature. Despite the major burden these illnesses place on health care services, there is little information about their cost to the community. The claims of superiority of specialist units