IN-PATIENT VERSUS OUT-PATIENT CARE FOR EATING DISORDERS

A West Midlands Development and Evaluation Service Report

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About West Midlands Development and Evaluation Service

The West Midlands Development and Evaluation Service produce rapid systematic reviews about the effectiveness of healthcare interventions and technologies, in response to requests from West Midlands Health Authorities. Each review takes 3-6 months and aims to give a timely and accurate analysis of the cost-effectiveness of the intervention accompanied by a statement of the quality of the evidence.

About InterTASC

West Midlands DES is part of a wider collaboration with two units in other Regions (the Trent Working Group on Acute Purchasing (Trent DES) and the Wessex Institute for Health Research and Development (South & West DES)) to share the work on reviewing the effectiveness and cost-effectiveness of clinical interventions. This group, InterTASC, shares work, avoids duplication and improves the peer reviewing and quality control of these reports.

West Midlands Development and Evaluation Committee Recommendation:

Not Supported

There is no evidence that in-patient treatment is better than out-patient treatment for the long-term outcome of eating disorders. It is therefore not supported where there is accessible specialist out-patient care available. (This decision refers to long-term treatment of eating disorders not to emergency admissions).

Anticipated expiry date

This report was completed in September 1999

The searches were completed in April 1999

There are no randomised controlled trials known to be in progress. Until a larger randomised control trial is completed there will be no basis for a more precise and reliable estimate of the level of benefits associated with in-patient versus out-patient care for eating disorders.

If and when a more reliable estimate of the level of benefits becomes available the economic evaluation will have to be adjusted accordingly.

1 Summary

- Eating disorders include anorexia nervosa, bulimia nervosa and binge eating disorder and can lead to long term psychiatric and physical ill health. Anorexia nervosa (AN) is considered to have the worst prognosis. Many more females than males are affected. The prevalence of AN in adolescent girls is estimated to be approximately 0.5%. The duration can vary from 1-30 years. AN has one of the highest rates of death of any psychiatric illness at 0.5% per year.

- The treatment of patients with AN can be as in-patient or out-patient, depending on physical, psychological and social factors, is expensive and can last many months or years. Patients commonly have low motivation to seek and comply with treatment and there are high dropout and relapse rates.

- This report examines whether in-patient care is more clinically effective and cost effective than out-patient care in the treatment of eating disorders.

- Medline, PsychLIT, BIDS ISI databases and the internet were searched for any effectiveness and cost effectiveness evidence comparing in-patient to out-patient treatment. The findings were 1 RCT comparing in-patient to two forms of out-patient treatment, 4 case control studies (none of which followed up both in-patient and out-patient groups), 2 case series comparing outcomes of in-patients to out-patients, 4 case series of 100% in-patients and 1 case series of 100% day patients. RCT follow up was for 5 years (unpublished data) and for case series varied between 1.5-11.7yrs.

- The RCT showed a greater (non-statistically significant) improvement in percentage well in the out-patient group and no difference in mortality. The case series showed wide variation and no trend in percentage well and mortality between the two groups. One quality of life study showed that AN patients have no problem with mobility, self care and pain but cannot carry out usual activities and have more anxiety/depression.

- No economic analyses comparing in-patient to out-patient treatment for eating disorders were found. A review of published and unpublished cost data showed a wide range of average cost per in-patient episode (£4,349-£32,636) and per out-patient session (£34.70-£68.44). However calculated, average out-patient was always less expensive than average in-patient treatment costs. As there were no statistically significant differences in findings on outcomes between in-patient and out-patient care, we were unable to progress to an analysis of cost effectiveness.

- Much more research needs to be undertaken on both in-patient and out-patient care for people with eating disorders. If out-patient treatment for AN is to increase, it is vital that the progress of these people is followed carefully.

2 Introduction

Eating disorders include anorexia nervosa, bulimia nervosa and binge eating disorder. Eating disorders can lead to long term psychiatric and physical ill health. Anorexia nervosa has one of the highest rates of death of any psychiatric illness[1]. The cost of eating disorders is considerable, impinging on primary health care, hospital in-patient and out-patient facilities.

Treatment of eating disorders includes weight stabilisation and attention to psychological factors. In the past the tendency was to admit most patients with severe eating disorders, principally anorexia nervosa, to an in-patient ward. The recent therapeutic trend has been to treat more patients on an out-patient basis, reserving the in-patient facilities for those most physically ill. It is unknown whether in-patient or out-patient treatment is more effective in the long term. This report examines the costs and benefits of in-patient versus out-patient treatment for patients with eating disorders.

3 Background

3.1 Nature of the problem

Eating Disorders include anorexia nervosa, bulimia nervosa and binge eating disorder. Many patients with anorexia nervosa also have symptoms of bulimia nervosa and vice versa. Some estimate that between 50-60% patients with bulimia nervosa have a history of anorexia nervosa.[2,3] Other estimates put this level at 35%[4] and 40%[5].

It may be that anorexia nervosa, bulimia nervosa and binge eating disorder are all different manifestations of one dieting disorder where any one sufferer has high or low levels of three parameters - weight, binge eating and purging/vomiting.[6]

3.2 Anorexia Nervosa

The four essential features of anorexia nervosa are:

- refusal to maintain a minimally normal body weight.
- intense fear of gaining weight.
- disturbance in the perception of shape or size of own body.
- amenorrhoea in post-menarcheal females.[7]

Anorexia nervosa can be of the restricting type, where weight loss is achieved by dieting, fasting or excessive exercise and there is no binge eating or purging, or the binge eating/purging type were regular binge eating and/or purging occurs.

3.2.1 Diagnostic criteria

Anorexia nervosa has been defined in various diagnostic criteria.[7,8,9,10,11] All of these are consistent, except for the Feighner criteria (1972) which included the requirement of age of onset less than 25 year old. This is now no longer accepted as a valid criterion.

3.3 Bulimia Nervosa

The five essential features of bulimia nervosa are:

- Recurrent episodes of binge eating. This is characterised by 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 and a sense of lack of control over eating during the episode.
- 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.
- The binge eating and inappropriate compensatory behaviour both occur, on average, at least twice a week for three months.

- Self evaluation is unduly influenced by body shape and weight.
- The disturbance does not occur exclusively during episodes of anorexia nervosa. [7]

Bulimia Nervosa is frequently associated with normal weight but sufferers can have fluctuating, low or high weight.

3.4 Binge Eating Disorder

Binge eating disorder is recurrent episodes of binge eating associated with loss of control and in the absence of regular use of inappropriate compensatory behaviours characteristic of bulimia nervosa. It is very rare that patients with binge eating disorder need inpatient treatment for the eating disorder itself. If patients are admitted who have binge eating disorder, it is usually for other reasons. Therefore, binge eating disorder will not be further mentioned in this review.

3.5 Outcome measures

3.5.1 Weight

Degree of underweight can be expressed in several ways:

- percentage of weight loss from original weight.

- percentage of actual to desirable weight (the weight associated with minimum mortality). This uses published weight for height tables for different age groups. This includes mean matched population weight (%MMPW or Ponderal index). Normal weight or 'well' is considered to be above 85% MMPW. [12]

- Body Mass Index (BMI) which is weight in kilograms divided by square of height in metres. BMI gives the following categories;

<15 Kg/m^2	emaciated
15-19.9 Kg/m^2	underweight
20-24.9 Kg/m^2	normal weight

According to DSM-IV diagnosis criteria, a person with anorexia nervosa has a weight less than 85% of normal weight for that person's age and height or has a BMI equal to or less than 17.5Kg/m^2

3.5.2 Global outcome

There are three main global outcome measures, used to assess severity of and changes in eating disorders, the first of which has three versions:

- Morgan-Russell
  1. 'Average outcome score' based on physical, psychological and social factors, scored from 0 (very ill) to 12 (completely well).
  2. 'General outcome' based on weight and menstrual function only. Categorical outcomes of good, intermediate and poor.
  3. 'modified Morgan-Russell' based on physical, psychological and social factors, scored from 0 (completely well) to 12 (very ill).
- Garfinkel global score based on physical and social factors, scored from 0 (completely well) to 23 (very ill).
- Eating Disorders Evaluation Scale (EDES) based on physical, psychological and social factors, scored from 0 (very ill) to 90 (completely well).

For further details of these global scoring scales, see Appendix 2.

Psychological outcome measures

3.5.3.1 Specific measures for eating disorders

There are two main self report questionnaire measures used - the Eating Attitudes Test (EAT) and the Eating Disorders Inventory (EDI). There is also a semi-structured clinical interview questionnaire called the Eating Disorders Examination (EDE). The EAT questionnaire has 2 versions - long (40 items) and short (26 items). Each item is scored from 3 (very anorexic) to 0 (not anorexic). The EDI has 64 items in eight subscales and is scored in the same way as the EAT questionnaire. The EDE has 62 items with ratings on a 7 point scale. For further details of these outcome measures, see Appendix 2.

3.5.3.2 General psychological measures

Many psychological measures have been used to assess people with eating disorders. These include the Beck Depression Inventory (BDI), scored from 0 to 63 where higher scores indicate greater depression and the Hopkins Symptom Checklist (SCL-90-R) where higher scores indicate worse symptoms on nine subscales of somatisation, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation and psychoticism. The SCL-90-R also has overall scores of global severity index (GSI) and positive symptom distress index (PSDI).

3.6 Factors associated with poor outcome

Numerous studies have tried to establish factors associated with good and poor outcomes. Some factors that have been associated with a favourable outcome are early age of onset, conflict-free parent-child relationship, a short interval between onset of symptoms and treatment intervention, a short duration of in-patient treatment with no readmissions, high social status, high level of education and a 'hysterical' personality. Unfavourable prognostic characteristics are the presence of vomiting, bulimic symptoms in anorexia nervosa, great loss of weight, chronicity, compulsiveness, premorbid development or clinical abnormalities.[13]

There is some dispute as to whether measures of weight such as MMPW and BMI can predict long term outcome of anorexia nervosa. Although some studies have found that low body weight at referral can influence prognosis[14,15] other studies have shown that weight is a non-predictor of outcome.[13,16] The percentage of anorexia nervosa patients who have developed bulimia nervosa on follow up[2,3,4,5] also suggests that weight is just one aspect of recovery from an eating disorder.

From reviews of follow up studies[13, 17,18,19], it seems that it is difficult to predict the clinical prognosis for the individual patient because of the extremely variable course of anorexia nervosa and the uncertainty of the long term effects of treatment.

4 Incidence and prevalence

Anorexia nervosa occurs most commonly in adolescent girls and young women, but adolescent boys and young men may also be affected as may premenarcheal girls and older women up to the menopause.[11] The ratio of females to males affected is approximately 10:1.[20]

An epidemiological study using the General Practice Research Database suggests that the 1993 incidence rate per year for women was 4.8 per 100,000 (95%CI 3.1-6.2) and for men was 0.15 per 100,000 (95%CI 0.1-0.2). The highest GP detected incidence rate was for females aged 10-19 at 34.1 (95%CI 24.5-43.6) per 100,000 per year[21].

In this study, there was little change in incidence between 1988 and 1993. Other studies have suggested that the incidence of anorexia is rising but this might be due to increased detection rates and increased awareness of the disorder in the general population[21].

The duration of anorexia nervosa can vary from less than one year to greater than 30 years. Anorexia nervosa can occur suddenly as a short, limited episode or may persist in chronic form for many years[22]. The median duration of illness is 6 years (range 0.25-lifetime)[23].

The prevalence of anorexia nervosa in adolescent girls is estimated to be approximately 0.5%[24].

There is a wide variation in crude mortality rates between different follow up studies from 3.0% to 25.5%.[1] These rates are from different lengths of follow up and are not adjusted for the expected number of deaths during the follow up period. Using aggregated data from 42 follow up studies, the mortality rate for anorexia nervosa has been estimated at 0.56% per year. (95%CI 0.33-0.79%). This is more than 12 times higher than the death rate due to all causes of death for females 15-24 years old in the general population. The main causes of death in the study were complications of an eating disorder (54%), suicide (27%) and unknown or other causes (19%).[25] The suicide rate for anorexia nervosa is more than 200 times greater than the suicide rate in the general population[25].

Mortality may be up to 5 times higher in those with anorexia nervosa who vomit compared to those who do not[26]. Standardised mortality rates are increased for anorexia nervosa[1,27]. and may be increased in bulimia nervosa but there is insufficient evidence from long term follow up studies to draw firm conclusions.[1,27,28]

The West Midlands, with an estimated population of 5.2 million, in 1 year it is estimated that there will be approximately 250 new cases of anorexia nervosa and approximately 6 will die.[29]

5 Current service provision

Current service can be categorised in two ways - location of treatment and treatment strategies.

5.1 Location of treatment

The treatment of patients with anorexia nervosa includes in-patient, out-patient and/or GP care. In-patient care can be in a specialist eating disorders unit or non specialist hospital ward. Out-patient care can range from full time day patient care during working weekdays in a specialist eating disorders unit to 1 hour counselling sessions once a week or less at an eating disorders unit or with the general psychiatric services or dietician department.

The majority of patients with uncomplicated bulimia nervosa are managed as out-patients.[30] Management of patients with mixed anorexia and bulimia nervosa can be either as in-patient or out-patients, depending on clinical factors such as current weight and clinical stability. Out-patient treatment is frequently used for the less severely affected patients, but is also used for those who refuse in-patient treatment.

In the West Midlands there are three dedicated in-patient facilities for eating disorders (at the Queen Elizabeth Psychiatric Hospital, Birmingham, at St Michael's Hospital, Warwick and at the independent Woodbourne Priory Hospital). Out-patient facilities in other West Midlands districts are part of the district psychiatric or dietetic service. Within this there may be a specialist eating disorders nurse or other health professionals who specialise in eating disorders but the distribution of specialists within the West Midlands is patchy.

Thoughts on the appropriate location of treatment have changed over time. In the past (1940s-80s) many people with anorexia were admitted for long term psychiatric in-patient care (up to 1 year or more). Since the early 1980's the tendency has been more to treat the acute physical problems of anorexia nervosa by a much shorter period of in-patient care, starting psychological therapy at the same time and then to continue the psychological care in the out-patient department. [31]

5.2 Treatment strategies

Treatment strategies include weight restoration, individual psychotherapy to remedy personal problems such as alienation and self esteem, family therapy to reduce the impact on relatives and resolve particular relationship problems and drug therapy.

People with eating disorders commonly have low motivation to seek and comply with treatment. This results in high dropout rates during treatment. Relapse rates following treatment are also high and relapses can occur years after a period of relatively good health. Therefore it is very difficult to tell when someone has been cured of an eating disorder.

6 Aim of this review

The aim of this review is to establish whether in-patient care is more clinically effective and cost effective than out-patient care in the treatment of eating disorders.

7 Methods

7.1 Development of protocol

A protocol for the report was developed with colleagues after a scoping review of the published literature. (See Appendix 3 for search strategies used). The protocol was subjected to external scrutiny and appropriate amendments made.

7.2 Search strategy

The detailed search strategy involved looking for randomised controlled trials (RCTs), case control studies and case series of in-patient and/or out-patient care of people with eating disorders. Ideally, RCTs were preferred but the search was widened to include other study types in case insufficient RCT evidence was found. More weight would be given to RCT evidence. Both index terms and text words were used in the search strategies. Three separate searches were carried out in Medline (1966-January 1999) on OVID. (see Appendix 3)

1. for RCT's using the NHSCRD search strategy for randomised controlled trials and the search term 'exp. eating disorders', 'exp. anorexia nervosa,' 'outpatient$', 'inpatient$' and 'residential'.
2. for case control studies, using the search terms 'exp. case control studies', 'exp. eating disorders', 'exp. Inpatients' and 'outpatients'.
3. for case series using the search terms 'case series tw', 'exp. eating disorders', 'exp. inpatients', 'outpatients', 'exp residential facilities', 'audit.ti,rw,sh' and 'exp treatment outcome'.

The following data sources were also searched:
Psychlit (1967-1998) using the search terms 'exp anorexia nervosa, inpatient tw, exp outpatients, exp residential care institutions.
Cochrane library, version 4 (1998), using the search terms eating disorders and anorexia nervosa.
Internet - a variety of sites including the National Library of Medicine and York NHSCRD sites. (see Appendix 3)
Recent editions of European Eating Disorders Review and International Journal of Eating Disorders were hand searched.
References from review articles, RCT's, case control studies and case series were checked for relevance to the review.

7.3 Inclusion criteria

The inclusion criteria for this study were:

- Randomised controlled trials or case control studies comparing in-patient or residential care to out-patient or day-patient or GP care.
- Case control studies comparing in-patient or residential care to out-patient or day-patient or GP care which included follow up for in-patients and out-patients.
- Case series of in-patient or out-patient care, irrespective of form of treatment given, starting with more than 100 patients and with a follow up of 1 year or more.

Inclusion and exclusion decisions were made before results of studies were examined.

7.4 Exclusion criteria

The exclusion criteria for case series were (any of):

- n<100
- no details of mean length of follow up
- less than 100% in-patients or less than 100% out-patients.

Where studies had a mixture of in-patients and out-patients it was excluded unless it gave separate outcome details for in-patients and for out-patients.

7.5 Quality assessment strategy

The following factors were considered when evaluating RCTs:

- the method of randomisation used, concealment of allocation and how this would affect outcomes.
- whether baseline characteristics and severity of illness were similar in control and treatment groups.
- whether the groups were treated similarly except for the randomised treatment
- the extent of treatment cross over
- the nature and extent of loss to follow up
- the extent of blinding of assessment
- whether the analysis was carried out on an intention to treat basis
- whether the conclusions match the results

The following factors were considered when evaluating case control studies:

- whether they compared in-patient to out-patient treatment
- whether the follow up was for both in-patients and out-patients
- whether the conclusions match the results

The following factors were considered when evaluating case series:

- whether the case series matched the inclusion and exclusion criteria
- whether the study was conducted prospectively
- whether the method of selection of cases was identified and appropriate
- whether the duration and completeness of follow up was reported and adequate

7.6 Outcome measures

The outcome measures assessed were deaths, global outcome categories (well vs remain ill) and Morgan-Russell mean scores for %MMPW, and global score.

7.7 Data extraction strategy

Two reviewers extracted the data from all the included studies independently into pre-defined tables. Any discrepancies were resolved by discussion.

7.8 Economic analysis methods

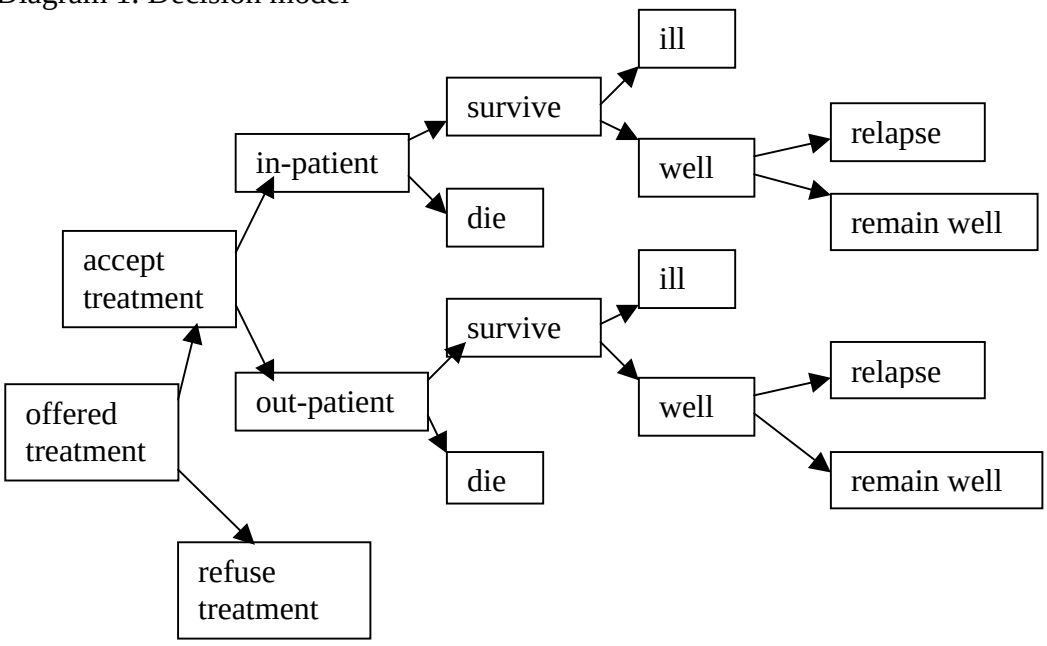
An additional search was made using Medline, Psychlit and relevant internet sites for any service use, cost and quality of life data on eating disorders (see Appendix 3). Both generic and patient centred outcomes were searched for.

A telephone survey of the service use and costs of treating people with eating disorders in District Health Authorities in the West Midlands was carried out.

7.9 Decision Model

In order to establish the overall effectiveness and cost effectiveness, an explicit statement of events and outcomes was made using the framework of a decision analytic model (see diagram 1).

Diagram 1. Decision model



The course of eating disorders can be relapsing in nature such that the true care pathways can be complicated. For those who are ill after treatment or who relapse, it could be that they will pass through several cycles of the above paths, remaining ill or relapsing until eventually they die or permanently recover.

Whilst all models, by definition, present a simplified view of reality, a more accurate reflection of the course of eating disorders could be provided through the use of more sophisticated modelling frameworks. However, the aim of this report is to provide a clear and concise assessment of effectiveness and cost-effectiveness based on existing evidence and it was felt that the simplistic but clear framework of a decision model was the best way to proceed.

7.10 Incremental Cost Utility Analysis

The scoping review suggested the availability of health-related quality of life outcome data for people with eating disorders. If such data were available in, or could be translated to, the format of a multi-attribute utility scale (such as EuroQol EQ-5D), then the cost-effectiveness of treatments assessed in this review could be compared to the findings of other health technology assessments.

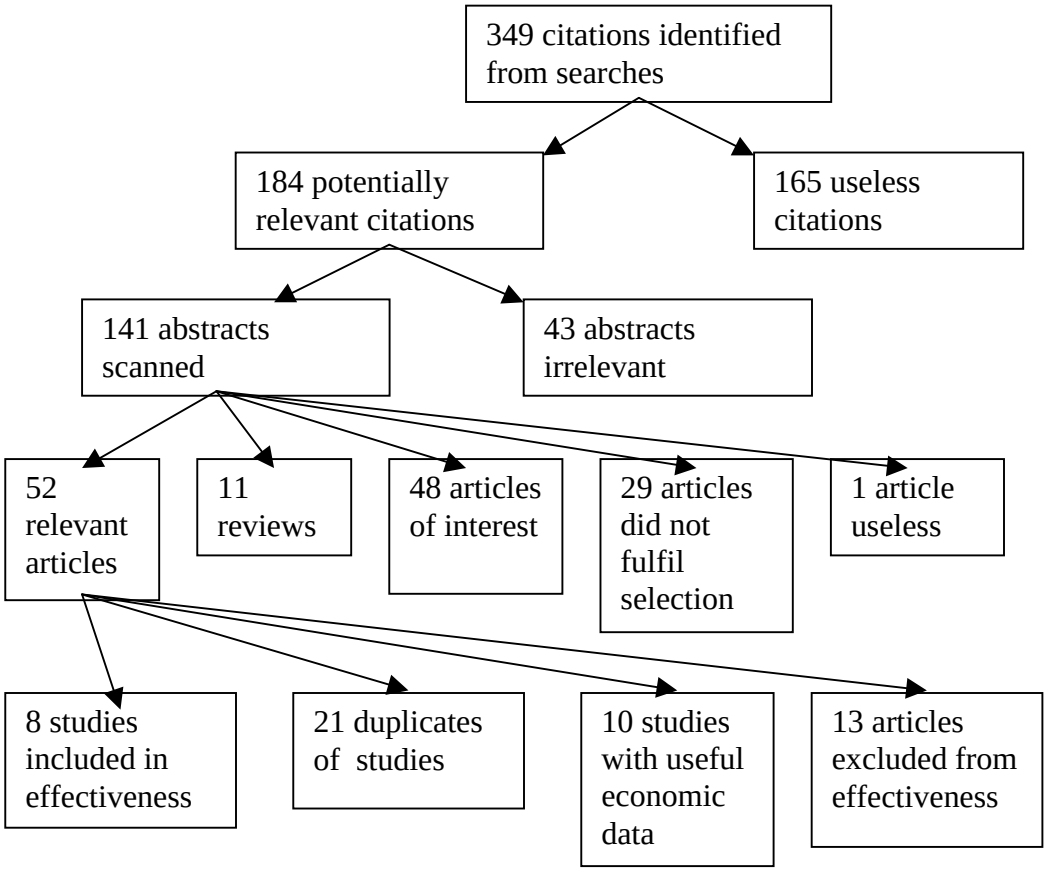
Therefore, the intention was to estimate the cost-utility of in-patient treatment compared to out-patient treatment for eating disorders, using the framework of the decision model above. This required evidence on the outcomes of each pathway in terms of mortality and morbidity (expressed in terms of impact of people's health-related quality of life), on the costs incurred along each pathway, and on the probabilities of progressing through each pathway.

Information on probabilities of mortality and health status on follow up for in-patients and out-patients was obtained from the best effectiveness evidence available. Information on the health-related quality of life of people with eating disorders could then be used to describe the health states in the model in terms of the EuroQol EQ-5D scale. These descriptions could then be used to calculate the gain in quality-adjusted life years (QALYs) that would have been expected from using the most effective treatment strategy (i.e. in-patient or out-patient treatment) rather than the alternative. The costs for in-patient and out-patient treatment were estimated from the best evidence available. The cost-utility of one treatment strategy over another would then be calculated as the difference in costs between the alternative treatments relative to (i.e. divided by) the difference in benefits gained (expressed in QALYs). All key assumptions and estimates should be subjected to sensitivity analysis.

8 Quality, direction and strength of the evidence

8.1 Number and types of studies

The outcome log of studies identified from the literature searches is shown in diagram 2.



Three types of relevant studies were found. These are listed in Table 1.

Table 1. Details of studies found

Type of study	Number of Studies	Source
Randomised Controlled Trial	1	Psyclit
Case Series (n>100, follow up >1year)	1 1 1 2 2	Psyclit Internet Handsearch of relevant journals Medline Referenced in journal article
Randomised Controlled Trial	1	Peer review process

8.2 Randomised controlled trials

One randomised controlled trial was found which was reported several times.[12,32,33,34] (Another small RCT was found which does not appear to have been fully published. This trial is mentioned in a conference proceeding[35] and in a day-patient treatment description article.[36] In this trial 32 consecutive referrals who would have been admitted as in-patients were randomly allocated to in-patient or day-patient treatment. At 2 years follow up there were no significant differences between the two groups 'in terms of weight gain or general psychopathology'.)

The published RCT had four treatment arms:

- in-patient treatment (I/P)
- out-patient individual and family psychotherapy (O/PF)
- out-patient group psychotherapy for patients and parents separately(O/PG)
- assessment interview only (A/I).

Follow up on this trial was planned for one, two and five years.

Follow up data at one year for all groups has been published, as has data at two years for the O/PF and A/I groups only. Follow up at 5 years was carried out.[31,37] Unpublished 2 and 5 year results have been obtained from the trial.[38]

Details of the trial design are shown in Table 2. All patients had to be sufficiently ill that in-patient treatment was a possibility but not essential. The assessment interview was carried out with all patients and was considered to be therapeutic in itself.

Table 2. RCT trial design

Target patient definition	Exclusions	Treatments used	Random-isation	Follow up period	Outcome measures
DSM-IIIR def-inition of AN, new female referrals, <10 yrs illness duration, living within O/P reach, written consent to study	living too far from hospital to attend O/P sessions (>40 miles)	1. I/P-several mths then 12 O/P sessions psychotherapy 2. O/PF-12 sessions 3. O/PG-10 sessions 4. A/I-referred back to local consultant or GP after initial assessment interview.	not stated (numbers from a hat)	1 yr 2 yrs 5 yrs	deaths, Morgan-Russell (%MMPW, menstruation, global outcome score). global outcome category

Although the trial was published as randomised, no details of the randomisation process or method of random allocation were mentioned. The randomisation process was actually carried out by taking numbers out of a hat after the assessment interview was completed. In only the last two patients was the treatment allocation known in advance.[38]

Initial patient characteristics and compliance details are shown in Table 3. They show that compliance was low for the in-patient group at only 60% accepting one week's

treatment or more. This was not unexpected because of the inflexible RCT treatment allocation. The I/P and A/I groups had a longer mean illness duration but the differences were not significant.

This trial was unfunded.[38] The out-patient treatment lengths for both the O/PF and O/PG groups was considered too short during the trial planning stage but lack of resources precluded longer treatment for these groups. The trialists would have preferred 50 sessions over 5 years in these two groups and 5 years follow up out-patient sessions for the I/P group. It is unclear as to whether the patients knew that they were part of a RCT. Informed consent was obtained from each patient's GP. Treatment offered in this trial may not be comparable to that in other treatment centres, because of the psychodynamic approach taken (patients are encouraged to consider recovery from AN as coming to terms with the social problems of physical growth/puberty which had been aborted by illness) and because very few patients in this trial were detained under the mental health acts.[38]

Table 3. RCT patient characteristics and compliance

Treatment	Number of patients	Mean illness duration (mths)	Number of treatment compliers	Mean treatment duration for compliers	Number with in-patient treatment elsewhere at 2 years
I/P	30	41.0	18	20 weeks	not stated
O/PF	20	33.4	18	9 sessions	3
O/PG	20	27.5	17	5 sessions	not stated
A/I	20	53.5	20	-	8

8.2.1 Quality assessment

This trial enrolled small numbers into each treatment group. Each treatment was clearly described. Demographic characteristics of the four groups were similar at presentation except that the mental state of the A/I group was significantly worse ($p<0.05$) than the I/P group. The size of the I/P group was deliberately set larger than the other three groups because of anticipated refusal of and non-compliance with treatment (compliance included a requirement of steady weight gain). Reasons were given for losses to follow up. Patients who declined one treatment allocation were not offered an alternative and were defined as non-compliers. Results were given for whole group and compliers only in each treatment group. Neither the participants nor the assessors were blind to treatment allocation. The I/P, O/PF and O/PG groups only were offered dietary advice and counselling. Psychotropic drugs were not prescribed for or consumed by any patients in these three groups. Additional treatment was offered to some subjects in the A/I group after 2 years 'because their condition was life threatening'[39]

8.2.2 RCT results at 1 year

There was one death only. This was in a patient assigned to the O/PG group who died from anorexia nervosa between randomisation and start of treatment. (see Table 4).

For the whole group results (rather than compliers only) there was a significant improvement in global score between presentation and one year follow up in all four groups. (see Table 5).

Compared to the I/P and A/I groups, the two O/P groups had a slightly bigger improvement in global score at 1 year. However, paired t tests comparing each of the three other groups to the A/I group showed that the increases in the I/P, O/PF and O/PG groups were not statistically significant. (see Table 6).

8.2.3 RCT results at 2 years

There were no further deaths in any group

For the whole group, there was a significant improvement in global score between presentation and 2 years for all four groups. There was a trend across all groups for the global score to increase from 1 year to 2 years, the significance of this trend is unknown. (see Table 5).

Compared to the I/P and A/I groups the two O/P groups again had a bigger improvement in global score but again, when compared with the A/I group these were not statistically significant. (see Table 6).

The percentage who were well reflected the improvements in global scores in that the two O/P groups had more well patients than the I/P and A/I groups. (see Table 7). The difference between the I/P and O/PG groups was not significant.

8.2.4 RCT results at 5 years

There was one further death, in the I/P group.

The Morgan-Russell global scores were not available for the five year follow up.

The percentages who were well (see Appendix 2) in the two O/P groups were higher than in the I/P and A/I groups. Between 2 and 5 years the percentages who were well increased in all 4 groups. (see Table 7). The difference between the I/P and O/PG groups was not significant.

Table 4. RCT results - deaths at 1, 2 and 5 years

Treatment	deaths at 1 year	deaths at 2 years	deaths at 5 years
I/P	0	0	1
O/PF	0	0	0
O/PG	1	1	1
A/I	0	0	0
follow up numbers	89/90	88/90	88/90

Table 5. RCT results - % MMPW and Morgan-Russell average outcome mean scores (with standard deviations) (where 0 = very ill and 12 = well)

Treat-ment	% MMPW			M-R Global score		
	at start	at 1 year	at 2 years	at start	at 1 year	at 2 years
I/P	72.0 (9.4)	83.8* (12.4)	86.9* (11.6)	3.4 (1.3)	5.5* (3.2)	6.1* (3.0)
O/PF	74.0 (6.9)	88.9* (11.7)	94.5* (14.0)	3.8 (1.3)	6.6* (2.6)	7.5* (2.8)
O/PG	73.8 (8.7)	91.8* (16.3)	93.2* (13.4)	3.8 (1.9)	6.2* (2.7)	7.7* (3.2)
A/I	75.0 (8.5)	79.5* (14.1)	83.0* (15.4)	3.4 (1.1)	5.7* (2.9)	6.2* (3.2)

*statistically significant change from start for that group

Table 6. RCT results - difference in global score between start and 1 year and start and 2 years for the four treatment groups

Treatment	start to 1year	start to 2year
I/P	2.1	2.7
O/PF*	2.8	3.7
O/PG*	2.4	3.9
A/I*	2.3	2.8

*Discrepancies between published and unpublished information. The results here are calculated from the unpublished information.

Table 7. RCT results – outcome category of well at 2 and 5 years.

Treatment	well at 2 years / whole group	well at 5 years / whole group
I/P	5/29 (17.2%)	9/27 (33.3%)
O/PF	4/20 (20.0%)	8/17 (47.1%)
O/PG	5/19 (26.3%)	10/19 (52.6%)
A/I	2/20 (10.0%)	6/19 (31.6%)
follow up numbers	88/90	82/90

8.3 Case control studies

Four case control studies were found (one was reported three times). Two compared eating disordered in-patients to out-patients[40,41] and the other two compared anorexia nervosa patients to matched population controls.[42,43,44,45] Three of the four studies have some follow up data but none of the studies compared follow up data for in-patients to follow up data for out-patients. Therefore, these studies are useful to show the differences between in-patients and out-patients at start of treatment, for physical and psychological factors, but do not show what subsequently happens following treatment.

8.3.1 Differences at assessment between patients offered in-patient or out-patient treatment

There are two case control studies comparing in-patients to out-patients at the start of treatment.[40,41] In the Kennedy study, the in-patient group were admitted and the out-patient group were not admitted to the ward from the same pool of out-patients who had no improvement after 2 years treatment at an eating disorders unit which offered both in-patient and out-patient care. In the White study the patients were drawn from two different pools of patients, in-patients from a hospital and out-patients from six community clinician's practices (mostly psychotherapists). The results of both these studies show that there are few differences between in-patients and out-patients on both physical and psychological variables at start of treatment, except for body weight. (see Table 8) (For further details of these studies see Appendix 4). Body weight is one of the main prognostic factors as outlined in the background section so the importance of the baseline difference in this factor should be weighed against the lack of difference in the other prognostic factors.

Table 8. In-patient and out-patient differences

Study	Physical and social factors		Psychological factors	
	differences	no differences	differences	no differences
Kennedy et al[40]	lower assessment weight as % of average lower minimum weight as % of average, longer length of illness	age, maximum weight as % of average	-	EDI all subscales (8) EAT-26 all subscales (3)
White et al[41]	more previous I/P treatment, more physical symptoms	age, marital status, AN/BN diagnosis, occupation, symptom duration, duration of diagnosed disorder, family history of eating disorder	higher EDI ineffec-tiveness, higher interoceptive awareness higher SCL-90-R somatisation, anxiety, and depression	EDI remaining 13 subscales, EDE, BSQ, RS, BDI, SCL-90-R remaining 6 subscales and GSI and PSDI

8.3.2 Local clinical audit

Audit has recently been started at the Queen Elizabeth psychiatric hospital, Reed unit (eating disorders service). Preliminary data is available which can separate between the in-patient and out-patient services. For anorexia nervosa data on mean BMI is available for 12 in-patients and 27 out-patients. The mean BMI for these groups at start of treatment was 12.3 and 16.6 ($p<0.001$). This suggests that local practice has the same trend to admit people with lower weight than those treated as out-patients. No comparisons of EAT-26 or EDI scores are available yet.

8.4 Case series

A total of 20 follow up case series were found which had started with more than 100 people with anorexia nervosa or mixed eating disordered patients. 13 of these case series were excluded because of reasons given in Table 9. After this exclusion/inclusion process all of the case series were assessed using a checklist designed to assist with the critical appraisal of case series. (see Appendix 6). The main aim of this checklist was to assess the potential for bias within the studies, considering specifically possible sources of selection, attrition and detection bias. Only one study[46,47], was found to have an acceptable standard in all three categories. Unfortunately the patient group included 30% in-patients and the remainder were out-patients only. The results were not presented separately for in-patients and out-patients so it was unusable for the purposes of this study.

Table 9. Reasons for exclusions of case series

Number of studies	Type of study	Reason for exclusion
1	Case series	Global or weight outcomes not reported
1	Case series	Follow up length too short
2	Case series	Follow up length not stated
9	Case series	Not 100% I/P or 100% O/P

8.4.1 Case series A – comparing in-patients to out-patients within the series

Two case series were found which compared results of in-patient to out-patient care, irrespective of form of treatment given, which had more than 100 patients in the series and a follow up of 1 year or more. The features of these two case series are shown in Table 10.

Table 10. Case series features. (compared in-patients to out-patients)

case series number	nos pts with data presented /initial nos patients	gender	mean illness duration on admission	range	% in-patients	date of treatment	mean length of follow up	range
1[15,48,49]	102/105	100% F	3.5yrs	<2yrs->7yrs SD 4.3yrs	59.8% 61/102	1968-72	5.9yrs	4-8yrs (SD 1.3yrs)
2[50,51]	143/224	100% F	-	<4yrs->10yrs	86.0% 123/143	<1980	-	>3yrs

One of the studies (case series 1) compares the in-patient and out-patient groups at the start of treatment. Their findings were that there were no significant differences between the two groups with regard to age, height, duration of severe dieting, amenorrhoea, previous in-patient treatment, bulimia, vomiting, anxiety in eating with others, social

class and marital status. However, there was again a significantly lower %MMPW in the in-patient group ($p<0.01$).

These two case series were matched to the checklist of quality criteria shown in Appendix 6.
This indicated that these series, particularly case series 2, could give biased results.

Table 11. Quality criteria for case series 1 and 2.

Study	prospective	case selection	follow up
1 (Crisp et al)	retrospective- **unacceptable**	consecutive - **ideal**	102/105 ie 3% loss to follow up - **ideal**
2 (Suematsu et al)	retrospective- **unacceptable**	not sure whether all relevant cases contacted - **unacceptable**	143/224 (or ?233) ie 38% loss to follow up. Also no mean length follow up given - **unacceptable**.

8.4.2 Case series A results

The results of these studies are shown in Table 12. They suggest that out-patients do better than in-patients.

Table 12. Case series global results (compared in-patients to out-patients)

case series number	dead (%)	Number alive followed up	global score used	well (%)	remain ill
1. I/P O/P	1/49 (2.0%) 0/31 (0%)	48 31	Morgan- Russell combined average and general outcome	22 (45.8%) 22 (71.0%)	26 (54.2%) 9 (29.0%)
2. I/P O/P	8/123 (6.5%) 0/20 (0%)	115 20	not specified	36 (31.3%) 11 (55.0%)	79 (68.7%) 9 (45.0%)

Case series 1 has follow up data published at 5.9 years but the follow up at 20 years has been carried out[39]. So far these results have not been fully published[52]. The mortality at 20 years was 4%.[1] Information is not available on the mortality of in-patients compared to the mortality of out-patients in this case series at 20 years or on the outcome of survivors in each group.

It seems likely that the better outcomes for the out-patient groups in these studies would largely be explained by differences in baseline characteristics.

8.4.3 Case series B - case series of in-patients and case series of out-patients

In order to compare case series of in-patient follow up data to case series of out-patient follow up data the case series must have 100% in-patients or 100% out-patients. Four in-patient and one day-patient case series were found which fulfilled the inclusion criteria of more than 100 patients and greater than 1 year follow up. (Two of these were reported more than once).

An additional case series was found with 100% in-patients. However, this was excluded because it contained no information on mean or range of length of follow up or mean or range of duration of illness on admission.[53] The patients in this study were treated between 1940 and 1965.

Eight case series were found which had more than 100 patients and follow up for more than 1 year but had less than 100% in-patients. For details of these see Appendix 6. No case series were found that followed up patients with anorexia nervosa or eating disorders treated exclusively in an out-patient setting.

Table 13. In-patient case series features

case series no	nos pts with data presented /initial nos patients	gender	mean duration illness on ad-mission	range duration illness on ad-mission	date of treat-ment	mean length of follow up	range length of follow up
3[26,54,55,56]	88/133 65/133	100% F	3.1yrs (from 145 pts)	(SD = 3.1)	1967-79	4.2yrs	1-12.4yrs
4[14,57,58]	84/103	96.1%F	8.3 (median)	-	1952-82	11.7yrs	-
5[59]	76/146	94.5% F	5.6yrs	1-19yrs	1968-82	11.7yrs	4-20yrs
6[60]	179/315	98.1%F	5.0yrs	-	1980-90	5yrs	-

Table 14. Day-patient case series features

case series no	nos pts with data presented /initial nos patients	gender	mean duration illness on ad-mission	range	date of treat-ment	mean length of follow up	range
7[61]	66/106	97.1%F	5.9yrs	(SD = 3.3)	1993-94	17.2 mths	6-33 mths

The day-patient series of cases were treated 8am to 4.30pm for 7 days per week for an average length of 13 weeks. Outside these hours the patients were not under medical supervision.

These five case series were matched to the quality criteria shown in Appendix 5. The results of this quality assessment are shown in Table 15. The results indicate that these series are of variable quality and it is difficult to tell whether they could be inherently biased in the results that they show.

Table 15. Quality criteria for case series 3 to 7

Study	prospective/retrospective	case selection	follow up
3 (Pierloot et al)	retrospective- **unacceptable**	consecutive - **ideal**	65/133 ie. 51% loss to follow up - **unacceptable**
4 (Remschmidt et al)	retrospective- **unacceptable**	consecutive - **ideal**	84/103 ie 18% loss to follow up - **acceptable**
5 (Jeammet et al)	prospective- **ideal**	consecutive - **ideal**	76/146 ie 48% loss to follow up - **unacceptable**
6 (Vandereycken et al)	retrospective and prospective cohorts but results not given separately - **unacceptable**	consecutive - **ideal**	179/315 ie 43% loss to follow up - **unacceptable**
7 (Gerlinghoff et al)	prospective- **ideal**	probably consecutive - **acceptable**	66/106 ie 38% loss to follow up – **unacceptable**

8.4.4 Case series B results

The results of the in-patient case series show that the percentage well at follow up ranges from 40-72% and that mortality at 5-12 years ranges from 2-11%. The day-patient series shows a substantially lower percentage well but a lower mortality. This may be explained by the follow up on the day-patient case series being much shorter than for the four in-patient case series.

Table 16. In-patient global results

case series no	died (%)	Number alive followed up	global score used	well (%)	remain ill (%)
3	10/88 (11.4)	55	Garfinkel	25 (45.5)	30 (54.5)
4	3/84 (3.6)	81	Morgan-Russell general outcome	58 (71.6)	23 (28.4)
5	10/129 (7.8)	76	own score defined in text	36 (47.4)	40 (52.6)
6	5/291 (1.7)	174	EDES	69 (39.7)	105 (60.3)

Table 17. Day-patient global results

case series number	dead (%)	Number alive followed up	global score used	well (%)	remain ill (%)
7	1/106 (0.9)	65	EDES	12 (18.5)	53 (81.5)

8.5 Summary of results

None of the differences between in-patient and out-patient groups shown in the tables below are statistically significant. The lack of significance in the RCT results may well be because of the small size of this unfunded trial.

Table 18. Results from RCT

	I/P	O/P	change (I/P minus O/P)	% change (I/P minus O/P)
mortality at 1 year	0/30 (0%)	1/40 (2.5%)		-2.5%
mortality at 5 years	1/29 (3.4%)	1/39 (2.6%)		+0.9%
change in MR global score from start to 1 year	2.1 (SD=3.1)*	2.5 (SD=2.6)*	-0.45	-3.75%
% well at 5 years	9/29 (31.0%)	18/39 (46.2%)		-16.7%

*Statistically significant change from baseline

Table 19. Results from case series

	In-patient	Out-patient and day-patient
Variation of mortality	1.7% to 11.4%	0% to 0.9%
Variation in well at follow up	31.3% to 71.6%	18.5% to 71.0%

The results from the RCT at one year appear to show a better health outcome in the out-patient groups than in the in-patient group. The results at 5 years results continue this trend. As the numbers in the RCT groups are small the mortality figures in particular, may not be reliable.

The results from the case series show a higher mortality for the in-patients but a better health outcome when compared to the out-patient and day-patient groups.

Both the RCT and the case series show considerable variation in the data. This suggests that any conclusions will be tentative at best.

9 Economic evidence

9.1 Economic analysis

No evidence was found of prior economic analyses comparing in-patient and out-patient treatment for eating disorders. Very little has been published on the costs of treating eating disorders, although more has been published on resource use in terms of treatment duration, and the RCT described above collected (unpublished) data on treatment episode costs. Whilst none of the studies included in the quality, direction and strength of the evidence section included data on health-related quality of life, three relevant studies were found which provide data on aspects of health-related quality of life of people with anorexia nervosa compared to healthy controls.

9.2 Resource use and costs

The only cost estimate found in the economic literature search was an Office of Health Economics publication from 1994.[62] This estimated the cost of an in-patient episode to be £3,550. The total costs for GP consultations for eating disorders in the UK in 1991 were estimated to be over £500,000pa. In the same year it was estimated that in-patient treatment for eating disorders cost the NHS £3.55 million, giving a total cost of over £4.23 million per year. This estimate did not include the cost of any out-patient services.

None of the case series included in the quality, direction and strength of the evidence section included cost data. However, three of case series B had some information on in-patient service use and one excluded case series had information on out-patient service use[63].

The Royal College of Psychiatrists carried out an audit of NHS service use in 1990 specifically on treatment for eating disorders. A similar audit was carried out in one state in Australia (New South Wales) in 1989-91 and in New Zealand in 1980-81.[64]

The RCT described in the quality, direction and strength of the evidence section had information on service use but no published data on costs. However, cost data was collected during the trial on service use and costs at one year. An unpublished study assessed service use and costs for 20 people with anorexia nervosa who attended the same clinic at which the RCT was undertaken, two years after the end of the RCT recruitment period.[65]

A telephone survey of district health authorities in the West Midlands was carried out as part of this report to try and find out the current local duration and costs of in-patient and out-patient treatment. For in-patients the duration of stay and the total cost for all in-patients per year or the cost per day were obtained. For out-patients, the approximate numbers having out-patient sessions and the average number of sessions per patient were obtained. (Detailed results are shown in Appendix 7.)

9.3 Service use for in-patients and out-patients

The duration of stay per in-patient episode and mean number of out-patient sessions per annum for a number of different studies are shown in Table 20 and Table 21. For the British estimates, it appears that there is a gradual reduction in duration of in-patient stay over time. Out-patient session numbers were particularly difficult to estimate in the telephone survey carried out as part of this report.

Table 20. Average in-patient treatment duration

	mean duration in days	country	date
case series 3	280 days	Germany	1967-79
case series 4	147 (median 120)	Germany	1952-82
case series 5	(median 90)	France	1968-82
Audit 1	95.6	GB	1990
Audit 2	31.7	Australia	1989-91
Audit 3	64	NZ	1980-81
RCT (compliers only)	140	GB	1983-87
Unpublished study	124	GB	1988-89
Telephone survey	100.5	GB	1999

Table 21. Average out-patient treatment duration

	mean number of sessions attended per year
Case series	13
RCT O/PF group (compliers only)	9
RCT O/PG group (compliers only)	5
Unpublished study (whole group)	5
Telephone survey	10

9.4 Unit costs

Costs for each in-patient treatment episode and out-patient treatment session have been obtained from a number of different sources. In each of the sources, the costs have been calculated in different ways, which may explain the variability of results. Current costs (to January 1998) have been calculated using the retail price index[66], using the index for January in each relevant year. For the RCT the date used was January 1985 as this was mid-point in the recruitment period. For the unpublished study, the date used was January 1989.

Table 22. Costs per in-patient episode

	cost (£)	Range(£)	date	calculated current cost (Jan 1998) (£)
OHE	3,550	-	1991	4,349
RCT	10,821	-	1983-87	18,924
Unpublished study	14,306	311-54,542	1988-89	20,557
Telephone survey	32,636	10,088-54,238	1999	-

Table 23. Costs per out-patient session

	cost (£)	range	date	calculated current cost (Jan 1998) (£)
RCT	34.70	-	1983-87	60.70
Unpublished study*	62.80		1988-89	90.24
Telephone survey	68.44	35-140	1999	-

*approximate only, includes day-patient treatment

9.5 RCT unpublished data: costs of treatment strategies

For the RCT the one year costs per average patient for each type of treatment were calculated (unpublished data) using 1985-86 costs for in-patients from the Atkinson Morley Hospital and out-patient and day-patient costs from St George's Hospital, (both in London). It is unclear how these unit costs were established. Also it is unclear as to why the O/P and A/I groups had any in-patient treatment and why the number of out-patient sessions does not tally with the published data.

Table 24. In-patient costs for RCT

	Duration (wks)	Unit cost (£)	Total (£)
I/P	14.1	767.2	10,821.2
O/PF	3.0	767.2	2,334.5
O/PG	1.7	767.2	1,320.7
A/I	2.3	767.2	1,742.6

Table 25. Day-patient costs for RCT

	Number of attendances	Unit cost (£)	Total (£)
I/P	0	124.9	0
O/PF	7.8	124.9	974.22
O/PG	0.6	124.9	74.94
A/I	0	124.9	0

Table 26. Out-patient costs for RCT

	Number of attendances	Unit cost (£)	Total (£)
I/P	7.2	34.7	248.7
O/PF	15.3	34.7	530.9
O/PG	10.7	34.7	369.6
A/I	6.4	34.7	220.3

Table 27. Combined costs for RCT

	Total (£)	Calculated current costs (Jan 1998) (£)
I/P	11,069.9	18,344.7
O/PF	3,839.6	6,362.9
O/PG	1,765.2	2,925.2
A/I	1,963.0	3,253.0

9.6 Quality of life

Three relevant studies were found which compared aspects of the quality of life for anorexia nervosa patients with healthy controls. (See Table 28).

One additional article was found which compared people with a more general eating disorders diagnosis to a variety of other health states and normal controls using SF-20. However, this article not used because most of the subjects had binge eating disorder and were 'markedly overweight'.[67]

Table 28. Quality of life in anorexia nervosa

study	type of study	comparison groups	comparison used	differences for AN group	no significant differences
Keilen et al [68]	comparison of QoL measurement, consecutive new referrals to 3^0 treatment centre)	Healthy female students, angina and heart transplant candidates)	Nottingham health profile	more problems with emotional reaction, social isolation, functional difficulties with daily living	pain, physical mobility, sleep, energy.
Gillberg et al [45]	case control study	<18yrs, sex, age and school matched healthy controls	EAT, SAT Morgan-Russell, interviews, etc.	more solitary, difficulty in making personal contacts and taking part in social activities	Employment.
Engel et al [69,70,71]	case series	All females 30-35yrs in Federal Republic of Germany 1983	marital and occupational status	more unmarried, full time workers and unemployed, fewer part time workers	-

The most useful of the articles in Table 28 compared anorexics to healthy controls and cardiac patients, using the Nottingham Health Profile, a generic measure of health status. The first part of this profile has 38 statements in six dimensions (see Table 29). The second part looks at 7 areas of daily life. A weight is applied to each yes/no statement giving a score ranging from 0 (no problem) to 100 (extreme problems). The data from this survey (estimated from publication graph) shows that people with anorexia nervosa have no problem with mobility, self care and pain/discomfort but do have problems with usual activities and anxiety/depression. The 70% confidence intervals are very wide, indicating much variation in the sample used in the study.

If future research found a significant advantage of in-patient treatment of eating disorders over out-patient treatment (or vice versa), the results of this study may be useful in translating the expected improvement in health outcomes as measured by disease-specific outcome measures such as Morgan-Russell scales into expected gain in quality-adjusted life years (using a generic scale such as EuroQol EQ-5D).

Table 29. Nottingham health profile for eating disorders (estimated from graph)[68].

Quality of life categories	score	lower 70% confidence interval	upper 70% confidence interval
energy	63	23	100
emotional reaction	62	35	78
social isolation	58	34	82
sleep	38	16	60
physical mobility	0	0	15
pain	0	0	15

10 Conclusions

The evidence from the single RCT with available data suggests that for the group of people with anorexia nervosa which is severe enough to consider in-patient care but not severe enough for this to be essential, out-patient treatment is at least as effective as in-patient treatment. Indeed, the findings are suggestive of better outcomes for the out-patient groups. The benefits of out-patient and in-patient treatment appear to increase over time. However, the size of the RCT means that none of these trends are proved. Out-patient treatment is also considerably cheaper.

There are some further caveats to this conclusion:

1. The RCT was not blinded and the difficulties in carrying it out means that the results must be viewed with caution.
2. All patients had to be sufficiently ill that in-patient treatment was a possibility but not essential. Therefore, the findings only apply where it is difficult to decide whether a person should be treated as an in-patient or as an out-patient. Where a person is profoundly physically ill or has dire social circumstances directly affecting physical wellbeing, in-patient treatment remains the treatment of choice.
3. The costs obtained from the RCT study group do not have precise details as to how they were collected. Therefore it is difficult to judge their accuracy.

The evidence from the case series show a wide variety of mortality and percentage well outcomes. This means that drawing conclusions from these case series as a whole is not possible.

Evidence from the case-control studies and audit suggest that, in normal practice, those admitted as in-patients have, on average, a lower weight than those not admitted. There are few other differences between those normally treated as in-patients compared to those normally treated as out-patients, particularly for psychological factors.

It seems likely that the average duration of stay for those treated as in-patients has been gradually reducing over the last 10 years.

The evidence on costs shows a wide variation in costs for in-patient and out-patient treatment. It is very difficult to establish how accurate any of these methods were but, whatever method was used, out-patient treatment always came out cheaper than in-patient treatment.

The available evidence shows no statistically significant differences in findings on outcomes between in-patient and out-patient care for people with eating disorders. This means that we were unable to progress to an analysis of cost effectiveness.

Much more research needs to be undertaken on both in-patient and out-patient care for people with eating disorders. The lack of sufficiently powered RCTs and of good quality case series of in-patients and out-patients suggests that this treatment area has not been sufficiently researched in the past. If more people are to be treated solely in an out-patient setting in the future, it is vital that the progress of these people is followed carefully, in order to confirm the suggested trends from the available research.

11 Acknowledgements

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12 Conflict of Interests

None. This report was funded by the NHS.

13 Appendicies

13.1 Appendix 1 - Abbreviations

A/I	Assessment Interview only group in reviewed RCT
AN	Anorexia Nervosa
BDI	Beck Depression Inventory
BMI	Body mass index
BN	Bulimia Nervosa
DSM-IIIR	Diagnostic and Statistical Manual of mental diseases, version III revised
DSM-IV	Diagnostic and Statistical Manual of mental diseases, version IV
EUROQOL	Measure of health status used for evaluating health and cost utility
GSI	Global Severity Index - part of SCL-90-R
ICD-10	International Classification of Diseases, version 10
I/P	In-patient
MMPW	Mean matched population weight
NHSCRD	National Health Service Centre for Reviews and Dissemination
O/P	Out-patient
O/PF	Out-patient individual and family psychotherapy group in reviewed RCT
O/PG	Out-patient group psychotherapy group in reviewed RCT
PDSI	Positive Symptom Distress Index - part of SCL-90-R
QoL	Quality of Life
RCT	Randomised controlled trial
SAT	Dewey Social Awareness Test
SCL-90-R	Hopkins Symptom Checklist - Revised.
SD	Standard Deviation

13.2 Appendix 2 - Global scoring methods and psychological outcome measures

Detailed and systematic clinical assessment (physical and psychiatric) of anorexia nervosa is commonly carried out by completion of assessment schedules during a guided interview with the patient. Information from a key informant is also frequently needed. These schedules are used to give a global assessment of the person's current state of health.

Morgan and Russell[72] devised two outcome scoring systems.

- The 'average outcome' score combines physical and psychological factors.
- The 'general outcome' score is based on weight and menstrual function only.

These assessment schedules were originally devised as a way of comparing outcomes from different follow up studies, but can also be used to compare a person's state of health from initial assessment to follow up. They are intended to be sufficiently simple and quick for routine use in clinical practice.[73]

The average outcome score uses five categories - nutritional status, menstrual function, mental state, sexual adjustment and socioeconomic status. These categories can score a maximum of 12 each giving a total of 60. In this scoring system a high score denotes a better health outcome than a low score. The categories are subdivided and the scoring system is not equally applied over these subdivisions. The global score is the sum of the category scores divided by 5.

The general outcome is a much simpler assessment instrument (see table below). Average body weight for age and height is taken from actuarial tables.

Morgan-Russell general outcome score descriptions of outcome categories.

	Good (well)	intermediate	poor
body weight	within 15% of average body weight	fluctuates below and within 15% limit	has never approached 15% limit
menstruation	Regular	'disturbances'	absent or virtually absent

The Morgan-Russell scales have been combined and modified[73] into a global outcome assessment which combines physical and psychological factors. The version shown in the table below has a current level of functioning which can be assessed using a six item, three point scale. Global outcome score can either be given as a number or as a category. Good outcome = 0-4, intermediate = 5-8 and poor outcome = 9-12.

Morgan-Russell global score descriptions of outcome categories.

score	0	1	2
weight (as %ideal body weight)	85-115%	115-130% or 70-85%	>130% or <70%
menstruation	Cyclical	sporadic	absent
subsequent hospitalisation	None	for other psychiatric disorder	for eating disorder
presence of eating habits (bingeing, purging, restricting)	None	1 of 3	2 or more
work/education	Constant	sporadic	none
social adjustment	in a relationship	interested in relationships	not interested in relationships

Another global outcome scoring method was devised by Garfinkel et al in 1977[74]. This is scored on a scale of 0 (completely well) to 23 (very poor outcome)

Garfinkel global score descriptions of outcome categories.

score	0	1	2	3
*weight (% of average)	90-109%	80-89% or 110-119%	75-79% or 120-125%	<75% or >125%
eating habits - *food faddishness *vomiting *bulimic episodes *laxative abuse	Absent	occasional	moderate	marked
menses - *occurrence *regularity	Present/yes	absent/no	-	-
*social adjustment	Relates well to males, peers and family	relates well in 2 of 3 areas	relates well in 1 of 3 areas	poor relations with everyone
*educational and/or vocational adjustment	Attends school or work regularly and works efficiently	attendance is good but work is below potential	frequent absences and/or poor performance	does not go to work or school.

The Eating Disorders Evaluation Scale (EDES)[60] is a semi-structured clinical interview questionnaire for the assessment of specific physical and psychological pathology of eating disorders. It was developed in around 1987. The design of it was inspired by previous similar instruments such as the Garfinkel global score. There are 15 categories scored from 6 to 0. Total score ranges from 90 (completely well) to 0 (extremely unwell).

EDES descriptions of outcome categories

score	6	4	2	0
*actual body weight	90-109	80-89 or 110-119	70-79 or 120-130	<70 or>130
*body weight fluctuations	<1kg	1-2Kg	2-5Kg	>5Kg
eating behaviour - *dieting *bingeing *vomiting *use of laxatives	Never	sometimes	often (weekly)	very often (daily)
preoccupations - *weight *food	None	moderate	strong	extreme
*menstrual function	regular/ pregnancy	irregular or artificial cycles	sporadic	absent
sexual - *attitude *behaviour	Pleasure	->	->	avoidance/ dislike
social - *family relations *social contacts *occupation	Good	fair	poor	bad
*mental state	Normal	mildly abnormal (no treatment needed)	markedly abnormal (O/P treatment needed)	grossly abnormal (I/P treatment needed)

13.2.1 Psychological outcome measures specifically for eating disorders

Self report questionnaire measures used in eating disorders include the eating attitudes test (EAT) and the eating disorders inventory (EDI). Both and are used in studying eating disorders or measure response to therapy but cannot be used as diagnostic tools for the detection of eating disorders in the general public. They both use 6 point forced choice Likert scales. They are both quick and easy to fill in but are vulnerable to biases of inaccurate reporting by subjects. The EDI has 8 subscales - drive for thinness, bulimia, body dissatisfaction, ineffectiveness, perfectionism, interpersonal distrust, interoceptive awareness and maturity fears. Results of these subscales can be given separately or they can be combined to give a total EDI score.

The Eating Disorders Examination (EDE) is a semi-structured clinical interview questionnaire for the assessment of specific psychopathology of eating disorders. It takes between 30-60 minutes to complete and uses ratings on 7 point scales. It may be a more sensitive measure to discriminate between patient's symptoms in eating disorders.

13.3 Appendix 3 - Search strategies

13.3.1 Initial searches for scoping review. November 1997.

Medline on OVID. 1963-1997.

1 randomised controlled trial.pt.
2 randomised controlled trials.sh.
3 random allocation.sh.
4 double blind method.sh.
5 single blind method.sh.
6 1 or 2 or 3 or 4 or 5
7 animal.sh.
8 human.sh.
9 7 not (7 and 8)
10 6 not 9
11 residential treatment/
12 eating disorders/
13 10 and 11 and 12
14 10 and 12
15 11 and 12
16 10 and 11
17 limit 12 to (human and english language and review articles)
18 limit 11 to (human and english language and review articles)
19 limit 17 to latest update
20 limit 18 to latest update

BIDS ISI. 1994-1997.

1 eating disorder
2 residential care
3 control*trial
4 1+2+3
5 1+2
6 2+3
7 1+3

Psychlit. 1990-1997.

1 exp appetite disorders
2 exp treatment
3 randomised controlled trial.tw.
4 exp residential care institutions
5 exp treatment effectiveness evaluation
6 1+4+5

World Wide Web. eating disorders.

Bandolier	www.jr2.ox.ac.uk:80/bandolier
Cochrane Collaboration	www.cochrane.co.uk
Centre for evidence based mental health	www.psychiatry.ox.ac.uk/cebmh.htm
York NHSCRD	www.york.ac.uk/inst/crd
HTA	www.soton.ac.uk/~hta/
SBU	www.sbu.se/home.html

CINAHL. 1990-1997 - eating disorders.

Longman Cartermill Current research in Britain. 1990-1997 - eating disorders.

13.3.2 Main searches. November 1998, January 1999.

Medline on OVID. 1963-1998.

1 randomised controlled trial.pt.
2 randomised controlled trials.sh.
3 random allocation.sh.
4 double blind method.sh.
5 single blind method.sh.
6 1 or 2 or 3 or 4 or 5
7 animal.sh.
8 human.sh.
9 7 not (7 and 8)
10 6 not 9
11 exp eating disorders
12 exp anorexia nervosa
13 10 and 11
14 10 and 12

Medline on OVID. 1963-1999.

1 exp case control studies
2 exp eating disorders
3 1 and 2
4 exp hospitalisation/ or exp hospitals, psychiatric/ or exp inpatients/ or exp psychiatric department, hospital/
5 outpatient clinics, hospital/ or outpatients/
6 3 and 4
7 3 and 5

Medline on OVID. 1963-1998.

1 exp eating disorders
2 exp inpatients
3 1 and 2
4 exp outpatients
5 1 and 4
6 anorexia nervosa
7 exp anorexia nervosa
8 2 and 7
9 4 and 7
10 audit.ti,rw,sh.
11 1 and 10
12 7 and 10
13 exp residential facilities/residential treatment/nursing homes/mental disorders/equilibrium.
14 1 and 13
15 case series.tw.
16 14 and 15

17 7 and 13 and 15
18 exp clinical trials
19 exp treatment outcome
20 18 or 19
21 13 and 20
22 7 and 21

Psychlit 1991-1998 and 1967-1990
1 exp anorexia nervosa
2 inpatient.tw.
3 exp outpatients
4 exp residential care institutions
5 exp health care costs
6 1+2
7 1+3
8 1+4
9 1+5

World Wide Web. eating disorders.

Centre for evidence based mental health	www.psychiatry.ox.ac.uk/cebmh.htm
national library of medicine	text.nlm.nih.gov/ftrs/gateway
York NHSCRD (HTA,DARE)	www.york.ac.uk/inst/crd
Cochrane Collaboration	www.cochrane.co.uk
ARIF	www.hsrc.org.uk/links/arif/arifhome.htm
Psychiatry research trust	www.iop.bpmf.ac.uk/home/depts/leaflets/7amo.html
European council on eating disorders	psyctc.sghms.ac.uk/eat_d/eced/
St George's Hosp. Medical School	psyctc.sghms.ac.uk/
Something fishy website	www.something-fishy.com/rese.html
Lucy Serpell's eating/eating disorders resources	www.iop.bpmf.ac.uk/home/depts/psychiat/edu/fr_eat.html

Journals hand searched

Eating Disorders Review	Vol 1 (1-2) 1993
European Eating Disorders Review	Vol 1 (3) 1993 - Vol 6 (4) 1998
International Journal of Eating Disorders	Vol13 1993 - Vol 26 1999

13.3.3 Economic evaluation evidence. April 1999.

Medline on OVID. 1985-1999.

1 exp eating disorders/
2 exp anorexia nervosa
3 1 and 2
4 1 or 2
5 exp quality of life
6 4 and 5
7 exp cost-benefit analysis/ or exp cost of illness/ or economic analysis.ti,rw,sh.
8 4 and 7

Psychlit 1991-1998 and 1967-1990

1 exp anorexia nervosa
2 inpatient.tw.
3 exp outpatients
4 exp residential care institutions
5 exp health care costs
6 1+2
7 1+3
8 1+4
9 1+5

World Wide Web. eating disorders.

York NHSCRD (NEED)	www.york.ac.uk/inst/crd
HTA	www.soton.ac.uk/~hta/
Cochrane Collaboration	www.cochrane.co.uk

13.4 Appendix 4 - Case control studies

The four case control studies which were found (one reported three times) are shown below. Two compared eating disordered in-patients to out-patients (Kennedy, White)[40,41] and the other two compared anorexia nervosa patients to matched population controls (Toner, Gillberg).[42,43,44,45] The quality criteria (below) show that the quality of these studies is variable. (Quality criteria adapted from NHSCRD 4[75])

Case control study design.

Study (date)	Target group definition	Control group definition	Exclusions	Treatment used	Follow up period	Outcome measures
Toner et al (1987) [42,43,44]	subgroup who agreed to participate in study from located subgroup of consecutive consultations	volunteers (inc. staff from same hospital) population matched by age, occupational status, education, no history of AN	not meeting Feighner criteria	not specified	mean 7.0 years (SD 2.0 approx)	EAT, EDI, locus of control, Body Dissatisfaction Scale, SCL-90-R, Janis-Field feelings of ineffectiveness scale, Social Adjustment self report questionnaire, clinical assessment.
Kennedy et al (1989) [40]	admitted to ward after >2 yrs O/P treatment with no improvement, DSM-IIIR diagnosis	not admitted to ward from same O/P pool. controls not matched	refusal of or unsuitable for admission	I/P refeeding weight restoration, O/P not specified	mean 2.1 yrs range 1.0-4.5 yrs. (I/P subgroup >1yr since discharge N=58)	EAT-26, EDI, age, duration of illness, weight, outcome categories, attitudes to treatment.
Gillberg et al (1994) [45]	population based, m and f, AN started <18yrs old. DSM111R diagnosis	sex, age and school matched, recruited at start of study.	not meeting DSM-111R criteria	Psycho therapy, drug, psychiatric treatment	AN mean 4.9 yrs, (95%CI 4.7-5.2) controls 4.6 yrs (4.3-4.9)	Dewey social awareness test, EAT, WAIS-R (Weschler), Millon clinical multiaxial inventory, Morgan-Russell AN outcome scales.
White et al (1998) [41]	volunteers new I/P<1wk, women, DSM-IIIR diagnosis of AN/BN, can read and write English.	volunteers new O/P <3wk. women, treated in 6 local practices controls not matched.	not stated	not specified	n/a	Physical symptoms checklist, BDI, SCL-90-R, EDI, EDE, Body shape questionnaire, Restraint scale.

Case Control Studies. Quality criteria

		Toner	Kennedy	Gillberg	White
Cases and controls characteristics	Are diagnosis criteria stated?	Y	Y	Y	Y
	Is severity of illness described?	Y	Y	Y	N
	Have suitable controls been obtained?	N	Y	Y	Y
	Are cases demographic details clearly described?	Y	Y	N	N
	Are controls demographic details clearly described?	Y	Y	N	N
	Significant selection bias of cases?	Y	Y	N	Y
	Significant selection bias of controls?	Y	N	N	Y
	Are cases and controls comparable (confounders)?	?	Y	Y	?
Intervention	Is the intervention clearly described?	N	N	N	N
	Was intervention assessed in same way for cases and controls?	-	-	-	-
Out-comes	Are outcome measures clearly described	Y	Y	Y	Y
	Is outcome assessed in same way for cases and controls?	Y	N	Y	?
	Is the non-response rate small?	N	N	Y	Y
	Is both group non-response rates same?	N	N	Y	?Y
	Is appropriate statistical analysis used?	Y	Y	Y	N

13.4.1 Case control study results

Case control studies – numbers and findings

Study	Cases and controls	Comment
Toner	149 26	No significant differences between restricting and bulimic subgroups on any clinical outcome categories
Kennedy	85 479	No significant differences between AN, AN+BN and BN groups on global outcome scores
Gillberg	51 51	No significant outcome differences between treatment and no treatment subgroups
White	25 25	Severity of illness defined by depression, somatization, feelings of ineffectiveness and physical symptoms

Three of the four studies have some follow up data but none of the studies compare follow up for in-patients to follow up for out-patients. The follow up results suggest a general trend that 40-55% get better and 45-60% remain ill. It is unknown how representative these results are of all people with anorexia nervosa/eating disorders receiving treatment.

Case control studies – results of follow up

Study	no cases followed up	follow up	well	ill	died
Toner	60 (/149)	mean 7.0 years (SD 2.0 approx)	23 41.8%	32 58.2%	5 (/74)
Kennedy	47 (/85)	mean 2.1 yrs range 1.0-4.5 yrs. (I/P subgroup >1yr since discharge only N=58)	25 53.2%	22 46.8%	not mentioned
Gillberg	51 (/51)	AN mean 4.9 yrs, (95%CI 4.7-5.2) controls 4.6 yrs (4.3-4.9)	21 41.1%	30 58.9%	0

13.5 Appendix 5 - Checklist of quality criteria for case series

13.5.1 Validity Assessment Criteria - Checklist for the critical appraisal of case series.[76]

Case studies and case series tend to fall fairly low in the hierarchy of evidence relative to other study designs such as RCTs and CCTs. However, in certain situations evidence from this type of research may be all that is available, particularly when the intervention of interest is in the early stages of its development or, conversely, when its effectiveness has been well established in the absence of well-conducted RCTs. Situations where case series are likely to provide valid information tend to be those where the natural history of the condition is understood and it is clear that cases who are untreated will have a poor prognosis. For situations where the prognosis of untreated cases is not known the information from case series is less helpful.

The purpose of this checklist to help the reader identify the strengths and weaknesses of a given case series in order that they may apply its results within certain limits as they are defined. It is important at the outset, however to note a couple of points;

- reliable and validated search strategies for primary study designs other that RCTs and CCTs are not yet available, hence the impact of retrieval and publication bias in reviews of case series is completely unknown and should be acknowledged
- it also possible that unbiased estimates of effect from case series may be contained within other study designs (e.g. each group within a comparative study may constitute a case series in its own right) and this should always be considered

Finally, it is important to stress that this checklist is a guide only. Appraisers may find that what constitutes acceptable assessment criteria may vary between situations and additional criteria specific to the subject area will often be required.

1. Was the study conducted prospectively?

Can be difficult to assess, but if the outcomes are clearly measured before and after the intervention, and criteria are clearly defined for the measurement of outcomes *a priori* it is highly probable that this was the case.

Information required
A description within the methods section describing the timing of the relevant events with respect to the initiation of the study, i.e. were cases selected for inclusion in the study before the results of the outcome of interest were known by the investigators.

Assessment Criteria
Ideal - Study states that it is conducted prospectively
Acceptable - Evidence that all key outcomes were measured before and after the intervention using clear criteria defined *a priori*.
Unacceptable - Study states that is was conducted retrospectively or it clearly does not measure key outcomes before and after the intervention
OR
no information.

2. Was the method of selection of cases identified and appropriate?

Again this is not always clear but if the case series has been selected from a wider population of cases treated it is important to assess whether this has been done in an unbiased way.

Information required
Detail within the methods or results section on the numbers treated and the numbers included in the case series and, if they are different, how cases were selected for inclusion and whether they were representative of the wider population.

Assessment Criteria
Ideal - Study states that a consecutive series of cases was included in the study.
Acceptable - Evidence that cases were selected for inclusion in an unbiased way or evidence that the characteristics of the included cases were not significantly different form those of the treated population.
Unacceptable - Clear evidence from the numbers that the included cases were a sample of those treated with no detail on the selection process or evidence that they were significantly different from the total population treated.
OR
no information.

3. Was the duration and completeness of follow-up reported and was it adequate?

Detail on losses to follow-up and deaths will usually be available. A particular problem in case series is that frequently only small subgroups of cases have reached given follow-up points which is potentially problematic if not handled carefully.

Information required
Numbers and characteristics of losses to follow-up and deaths.

Assessment Criteria
Ideal - Follow-up data on 80 - 100% of cases.
Acceptable - Adequate management of deaths and losses to follow-up such as detailing their characteristics, performing sensitivity analyses and/or including them in the final analysis
OR
If losses to follow-up are cases who have not yet reached a given follow-up point, are those for whom data is available treated as a cohort, with results presented for the cohort *only* before and after the intervention?
Unacceptable - Losses to follow up of over 20 - 25% particularly if they are unaccounted for.
OR
Follow-up data for a subgroup of patients followed up to a given point using baseline data for the whole series as a comparator
OR
no information.

13.6 Appendix 6 - Excluded case series with quality assessment

Laboucarie A, Rascol E, Karkous E, Queritet MC, Philip B.(Mental anorexia, datas based on a therapeutic and clinical experiment carried out on 173 cases). Revue Medicale de Toulouse. 1966. 2. 193-210.
No information given on whether it was prospective, how cases were selected and mean length of follow up.

Dally PJ. Anorexia nervosa. Heinemann. London. 1969.
2/3rds prospective and 1/3 retrospective and results from the two groups not separated, no information on mean length of follow up.

BassΦe HH, Eskeland I. A prospective study of 133 patients with anorexia nervosa. Acta Psychiatrica Scandinavia. 1982. 65. 127-133.
No information on case selection. No data on losses to follow up.

Tolstrup K, Brinch M, Isager T, Nielsen S, Nystrup J, Severin B, Olesen NS. Long term outcome of 151 cases of anorexia nervosa. Acta Psychiatrica Scandinavia. 1985. 71. 380-387.
Brinch M, Isager T, Tolstrup K. Anorexia nervosa and motherhood: reproduction pattern and mothering behaviour of 50 women. Acta Psychiatrica Scandinavia. 1988. 77. 611-617.
Tolstrup K. What can we learn from long term outcome of anorexia and bulimia nervosa. In Herzog W, Deter HC, Vandereycken W, (eds). The Course of Eating Disorders. Springer. Heidelberg. 1992. 228-238.
Retrospective.

Dally P. Anorexia nervosa: do we need a scapegoat. Proceedings of the Royal Society of Medicine. 1977.70. 470-474.
No mention of whether prospective or retrospective, no information on case selection, no information on mean length of follow up.

Engel K, Meyer AE, Hentze M, Wittern M. Long term outcome in anorexia nervosa inpatients. In Herzog W, Deter HC, Vandereycken W, (eds). The Course of Eating Disorders. Springer. Heidelberg. 1992. 118-132.
Engel K. Termination of inpatient treatment of anorexia nervosa. Psychotherapy and Psychosomatics. 1989. 51. 62-68.
Engel K. Prognostic factors in anorexia nervosa.. Psychotherapy and Psychosomatics. 1988. 49. 137-144.
Retrospective, case selection not stated.

Herzog W, Deter HC, Schellberg D, Seilkepf S, Sarembe E, Kroger F et al. Somatic findings at 12-year follow up of 103 anorexia nervosa patients: results of the Heidelberg-Mannheim follow up. In Herzog W, Deter HC, Vandereycken W, (eds). The Course of Eating Disorders. Springer. Heidelberg. 1992. 85-107.
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Deter HC, Petzold E, Hehl FJ. (Differentiation of long term effects of stationary psychosomatic therapy among patients with anorexia nervosa). Zeitschrift fur Psychosomatische. 1989. 35(1). 68-91.
Retrospective.

Button EJ, Marshall P, Shinkwin R, Black SH, Palmer RL. One hundred referrals to an eating disorders service: progress and service consumption over a 2-4 year period. European Eating Disorders Review. 1997. 5(1). 47-63.
Retrospective, 35% lost to follow up.

13.7 Appendix 7 - Telephone survey of in-patient and out-patient costs for district health authorities in the West Midlands

These costs are approximations only. The different ways they have been calculated by the different health authorities means that they are not comparable. It would be misleading to say, for example, that Worcester is a cheaper place to obtain in-patient treatment for eating disorders than Shropshire. What can be surmised is that the range of costs varies very widely. The treatment cost ranges were not available for several local authorities. There was very little data available on recorded average number of out-patient treatment sessions used.

In-patient costs by West Midlands district health authority

Authority	cost per day	range	mean stay duration (days)	range	total cost per patient	range
Hereford	£312.50	£300-£325	135	90-180	£42,750	£27,000-£58,000
N. Staffs					£41,625	£421-£135,000
Sandwell	£300		90		£27,000	
Shropshire					£54,238	
Solihull	£280	£267-£300	120		£34,000	£32,040-£36,000
Warwick	£176.99		57	10-200	£10,088	£1,770-£35,398
Worcester					£18,750	£5,000-£76,000

Out-patient costs by West Midlands district health authority

Authority	cost per ordinary session	cost-other	mean no sessions
Hereford	£42.50		10
N. Staffs	£41.73	£99.90-psychologist £38.39-counsellor	
Sandwell	£80		10
Shropshire	£75		
Solihull	£35 (dietician)		
Warwick	£64.83	£127.60 1st Appointment	
Worcester	£140		

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