

Section II

Clinical Entities

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The purpose of this section is to provide a systematic and careful delineation of diagnostic considerations and clinical features of the eating disorders.

Increased case detection and clinical reporting of the eating disorders in the past decade has led to recognition of the need for studies based on controlled and accurate observations of developmental features, epidemiology, clinical phenomena, family interactive patterns, and sociocultural influences.

From the earliest clinical descriptions of anorexia nervosa by Morton (1689), Gull (1873), and Lesegue (1873) and suggestive bulimic features reported in certain patients by Abraham (1916) and Wulf (1932), paradoxes and obscurities have abounded, clouding a clear understanding of the subtle interactions of eating, nutrition, and behavior. To advance beyond stereotypic conceptions we must broaden our understanding of the eat

ing disorders for different ages, genders, and cultural groups. We must also be more aware of the psychobiologic significance of appetite and eating disturbances in other medical and psychiatric disorders.

Medical and dental complications of eating disorders must be recognized to fully comprehend the symptoms of psychological and physical impairment that determine the clinical presentation of patients and pose both acute danger and possible chronic handicap. Studies of potential specificity of CNS neurotransmitters and neuroendocrine regulatory defects may define subgroups of patients with anorexia nervosa and bulimia and enable us to identify them with clinical and laboratory findings. A broadened clinical perspective along with increasing public and professional interests will promote research to define more specific therapeutic interventions in the future.

Chapter 12

Prevalence and Incidence Studies of Anorexia Nervosa

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Epidemiology has been defined as, “the field of science dealing with the relationships of the various factors which determine the frequencies and distributions of a disease or a physiological state in a human community,” [1]. This form of information can have multiple purposes. First, the study of demographic variables associated with the prevalence and/or incidence of anorexic nervosa may lead to a better understanding of the etiological factors associated with the onset of this disorder. This information can also be used in planning preventive strategies. Second, of particular importance during this period of economic constraint, this information may be required to justify the need for adequate treatment facilities to health care administrators.

In this chapter we will focus primarily on the prevalence of anorexia nervosa and the various demographic variables that have been shown to be associated with this disorder. We will only comment briefly on outcome studies as they might affect prevalence rates.

Our objectives are to provide the reader with the following:

1. A thorough updated review of published epidemiological studies of anorexia nervosa,
2. Information in a tabular form that will allow the reader to obtain a chronological view of the literature and to note the important features of each referenced study,
3. A review of the problems inherent in previous work, and,

4. Directions for future work.

HISTORICAL CONSIDERATIONS

It has become clear from previous reviews of the history of this disorder that accurate clinical descriptions have been available since the early 1870s. However, as London [2] has pointed out, it is also possible that until the early 1900s many anorexics may have been misdiagnosed as suffering from “chlorosis” (hypochromic anemia) or amenorrhea. In any case, until the early 1910s this disorder was felt to be quite rare and was recognized as requiring psychological treatment primarily. In 1914 the description by Bliss and Branch of a patient with anterior pituitary damage and weight loss ushered in a new era for the diagnosis and treatment of anorexia nervosa [3]. For the next three decades this illness was seen as a primary endocrine illness and patients were likely to be treated by endocrinologists. The illness was still felt to be rare. However, in the absence of the identification of a causative primary endocrine disturbance and with the increasing body of literature from psychiatrists regarding psychological etiologies, the diagnosis and treatment of anorexia nervosa gradually shifted back to mental health professionals over the last three decades. This trend has persisted to the degree that the diagnosis of anorexia nervosa has now been clearly outlined in the Diagnostic and Statistical Manual of Mental Disorders of the American Psychiatric Association of Mental Disorders (DSM III) [4], and its management is now pri-

marily carried out in mental health care settings.

Although it would appear that the psychological and behavioral symptomatology of anorexia nervosa has remained constant throughout the years, it was only in 1972 that specific diagnostic criteria were first spelled out [5]. This occurred as part of the general movement in American psychiatry to attempt to standardize diagnoses as reflected by the DSM III [4]. Before this development the majority of epidemiologic work had depended on case reports and the significant description of larger cohorts of patients by a few recognized experts in the field [3,6]. These works have been of great importance in providing the foundation for our understanding of this disorder, but they could not address the prevalence issues accurately and may have in fact been somewhat misleading, because they may have reflected the features of a selected sample of anorexics.

More recently this introduction of diagnostic criteria and the increased awareness for the need to develop reliable and valid questionnaires have resulted in an increasing number of epidemiological studies, using questionnaires and structured interviews of general and student population. These studies are leading some to the realization that anorexia nervosa may well be part of a continuum of eating disorders and that it exists in mild and moderate forms as well. Adding to this view are surveys of the attitudes of the general adolescent population toward food and eating, which have shown that large numbers of today's young people possess unhealthy attitudes toward food and maladaptive eating behaviors.

COMMON LIMITATIONS OF THE SURVEYS REVIEWED

A number of common limitations were shared by several of the epidemiological studies reviewed. These should be kept in mind in interpreting the data presented in the following tables:

1. The lack of standardized criteria for case recognition, particularly before 1970,
2. The variability of the methodology used to identify cases,
3. The tendency of hospital case register studies to identify only the most severely ill and only those able to obtain appropriate treatment,
4. The tendency that anorexic patients have in denying or hiding their symptoms, thus often delaying recognition and treatment,
5. The limitation of overly specific criteria leading to the exclusion of mild to moderate forms of the disease,
6. The lack of adequately defined geographical populations being studied.

PREVALENCE OF ANOREXIA NERVOSA

The information regarding the incidence and prevalence of anorexia nervosa is presented in three tables that are divided according to the type of population studied. Table 1 presents the finding of studies relating to the incidence of anorexia nervosa in the general population. These studies were carried out between 1930 and 1983. The majority before 1980 relied primarily on the case registers of hospitals for identifying anorexic patients. Those conducted since 1970 have relied more often on questionnaires designed to identify symptomatology as outlined in the DSM III [4]. Although the case register studies were conducted in different countries (eg, Sweden, Switzerland, United States, Scotland, and Britain) they show remarkably similar trends over time. Thus, it seems that the incidence of severe cases of anorexia nervosa coming to the attention of health care professionals before 1960 was 0.24 to 0.45 per 100,000 population per year, and this has increased to 0.45 to 1.6 per 100,000, after 1960. Although most of the studies suffer from the limitations outlined before, the similar ranges of these figures and the generally increasing trend found by all investigators support the impression that anorexia nervosa is being treated in increasing numbers in hospitals in North America and Europe.

This impression, however, is challenged by the 0.1 per 100,000 population overall lifetime prevalence found by Robins et al in a yet unpublished recent large-scale survey in the United States. This finding may not be that surprising if one observes that Robins and his collaborators only surveyed populations aged 18 or older and strictly applied the DSM III criteria. Thus, many of the younger and mild to moderate cases were excluded from this figure. Indeed, their observation stands in contrast with the survey conducted by Pope [10] recently among women shoppers in the United States, which reported a prevalence of 0.7%.

The prevalence of anorexia nervosa in the general medical population is reviewed in table 2. Data presented there reviews findings carried out during 1974 to 1979. Interpreting this information is considerably limited because of significant differences between the methods of case recognition and between the medical programs from which case were identified. Of historical interest is the interesting speculation by Loudon [2] that perhaps many of the female patients that presented to hospitals during the 18th and early 19th centuries who were diagnosed as suffering from chlorosis or amenorrhea were possibly anorexic. Indeed, the clinical description of chlorosis and the demographic variables associated with the illness (eg, upper socioeconomic-class females) were suspiciously similar to that of anorexia

Table 12.1 Incidence of Anorexia Nervosa in the General Population

Approximate Period Surveyed	Incidence/100,000 Population Per Year	Population Base (N=anorexic cases)	Method of Recognition	Authors and Date of Publication
1931-1960	0.24R	Women hospitalized for anorexia nervosa in departments of internal medicine, pediatrics, gynecology in a defined area in South Sweden (N=94)	Case registers and interviews with patients or families, questionnaires and psychological test.	Theander (1970) (6)
1951-1960	0.45	General Population	Case registers	Kendell et al (1973) (7)
1960-1969	0.37	Camberwell, Lon. (N=8)		
1965-1971	0.66	Monroe County, N.Y. (N=24)		
1966-1969	1.6	N.E. Scotland (N=30)		
1960-1969	0.35	Monroe County, USA	Psychiatric case registers and hospital records	Jones et al (1980) (8)
1970-1976	0.64	White population (N=53)		
1956-1975		Admissions to pediatric and psychiatric clinics in a defined region in Switzerland (N=65)	Case histories	Willi and Grossman (1983) (9)
1956-1958	0.38			
1963-1965	0.55			
1973-1975	1.12			
1980		18 or older general population (N=6)	Diagnostic interview schedule (DIS) and DSM III diagnostic classification	Robins (1984) Unpublished manuscript
	0.1	Overall lifetime prevalence		
	0.05	male lifetime prevalence		
	0.08	female lifetime prevalence		
		New Haven, Baltimore, St. Louis		

nervosa. In addition, a recent study [14] has also shown that a significant percentage of women coming to amenorrhea clinics in departments of gynecology have anorexia nervosa. Hence, although it is impossible to estimate the exact proportion of patients who had anorexia nervosa during those years and were treated for chlorosis or amenorrhea, it is probable that a significant percentage of these patients were anorexic. Of trans-cultural interest is the study carried out by Buhrich [12] suggesting a relatively low prevalence of anorexia nervosa among psychiatric patients in Malasia, perhaps secondary to different sociocultural pressures.

Table 3 reviews some more recent studies conducted primarily in student populations. Of these the best known and most quoted study is that of Crisp et al [15] conducted among English school girls in private and

public schools. In this work Crisp and his collaborators made a great effort to identify unequivocal cases of anorexia nervosa. The majority of teachers in these schools met with the authors to identify current and past cases. This case spotting also involved checking the medical records of the students before accepting the diagnosis. In doubtful cases, additional interviews were conducted. The comprehensive (public) schools were very large, hence the information accepted was only for the current school year, and there was less detail than that in the independent schools (private). The diagnostic criteria allowed the inclusion of only severe cases of anorexia nervosa, that is, only patients who had lost at least 30% of their body weight. Thus, 27 cases were identified. In the comprehensive schools only one case was identified. The overall prevalence was 0.25% with a range of 0.05%

Table 12.2 Prevalence of Anorexia Nervosa in Medical Hospital Population

Approximate Period Surveyed	Prevalence (%)	Population Base (N=anorexic cases)	Method of Recognition	Authors and Date of Publication
1972	5.6	Japanese adolescents with school maladjustment and psychosomatic disorders (N = 13)	Not specified	Ikemi et al (1974) (11)
1774-1818	0.9-4.6* with chlorosis and/or amenorrhea	Female medical admissions to various dispensaries *(possible anorexics)	Case registers	London (1980) (2)
1760-1840	1.4- 5.1	Outpatient admissions for various hospitals, England	Case registers	
1953-1979	0.05	Patients attended by 17 psychiatrists (N = 30) Malaysia	Questionnaire given to 17 psychiatrists who recorded their patients	Buhrich (1981) (12)
1976-1977	0.28 0.88	Outpatients in 35 medical institutions in Japan (N = 267) Inpatients in 35 medical institutions in Japan (N = 157)	Hospital charts and a list of symptoms similar to DSM III	Suematsu et al (1983) (13)

in the public schools to 1.05% in the girls over age 16 in private schools. Due to the severity of the diagnostic criteria used in this study, milder cases were probably excluded. Other surveys have reported figures in the range to 0 to 4.2% among high school and college students. These studies may not have used as strict a procedure as Crisp et al [15], and this may account for their slightly more elevated prevalence rates. Alternatively, since these studies are also more recent, they may reflect an increase in the prevalence of the disease.

Further evidence regarding the influence of sociocultural factors has been provided by prevalence studies of anorexia nervosa in special groups. These results are presented in table 4. The table represents findings of studies carried out from 1978 to 1983. Professional dancers, modeling students, and dieticians were surveyed. Prevalence estimates were relatively high, ranging from 1.4% to 7.6%, the higher prevalences being among the more competitive professional dance student groups. This observation, along with similar trends observed by Smith [22] and Yates [23] among athletes points to the perfectionism, rigid self-discipline, high performance expectations, high competitiveness, high tolerance of physical pain, and viewing one's body as an

instrument to reach a goal, as common factors that may lead the vulnerable individual to anorexia nervosa.

STUDIES USING THE EATING ATTITUDES TEST (E.A.T.)

The results of previous studies using the E.A.T. are presented in table 5. The E.A.T. is a 40-item questionnaire developed by Garner and Garfinkel [24] to assess the broad range of symptom areas associated with anorexia nervosa, including food preoccupation, body image for thinness, dieting, slow eating, clandestine eating, social pressure to gain weight, vomiting, and laxative abuse. Subjects respond on a five-point scale ranging from "very often" to "never" on how well the item applies. The E.A.T. score is then calculated according to a method outlined by Garner and Garfinkel. The scale in the original study had an internal reliability coefficient of 0.94 and overall validity coefficient of 0.72. In that study the mean E.A.T. scores of patients with anorexia nervosa were significantly higher than that of normal controls, obese women, and recovered anorexics. This report, along with subsequent work using dance and music students [20], has encouraged several

Table 12.3 Prevalence of Anorexia Nervosa in Student Populations

Approximate Period Surveyed	Prevalence (%)	Population Base (N=total number surveyed)	Method of Recognition	Authors and Date of Publication
1972-1974	0.46	Independent sector (private) schools for girls in England (N=9605)	Clearcut cases of primary anorexia nervosa recognized in school records by teaching staff and discussed with consultants	Crisp et al (1976) (15)
	0.17	Girls under 16		
	1.05	Girls over 16		
	0.05	Comprehensive (public) schools (N=2786)		
	0.25	Overall		
1975		Female students at Edinburgh University (N=3139)	Questionnaire about different diseases	Sheldrake et al (1976) (16)
	2.0	arts (N=1249)		
	1.3	social science (N=871)		
	2.3	professional studies (N=471)		
	1.3	science (N=548)		
1979		Students in high schools in Johannesburg, 16 years and older (N=1246)	Measurements of the body size and weight	Ballot et al (1981) (17)
	2.9	Overall		
	4.0, 2.6	Two coeducational provincial schools		
	1.9	Working class schools		
	3.7	Girls-only school		
	0.0	Two private schools		
	4.8	One private school		
1983		Students from three schools: two colleges and one high school (female N=544)	Questionnaire using the DSM III criteria	Pope et al (1984) (18)
	1.0-4.2	USA		

other investigators to use the E.A.T. to study the prevalence of maladaptive eating behaviors among general populations at high risk (high school and college students). The percentages of students with E.A.T. scores in the anorexic range have tended to be higher than the percentages obtained from the stricter prevalence studies of students reported in table 3. This is not surprising, because the E.A.T. may indeed report false positives as well as mild and moderate forms of the disorder. Button and Whitehouse [25] studying a population of 578 English college students, found that 6.3% of the female students aged 16 to 22 scored in the anorexic range. Follow-up interviews identified only one of these students as suffering from the severe syndrome, while the rest suffered from "subclinical anorexia." Another British study conducted by Mann et al [29] among a population of 15-year-old English schoolgirls found

6.9% of these students to score in the anorexic range. On further interviewing these students, no full anorexic syndrome was discovered. However, a number of these girls suffered from a partial syndrome. Mann then pointed out that despite the satisfactory sensitivity and specificity of the E.A.T. when using the recommended cut score in populations where the prevalence is small, significant numbers of noncases will be identified. In a study comparing anorexic patients and bulimic patients, Srikameswaran [27] revealed that the mean scores of both these groups of patients were equally high. These concerns regarding false positives were further substantiated by a large-scale survey conducted by Leichner et al [30] among 4,649 Canadian high school and college students aged 12 to 20. These investigators found higher mean E.A.T. scores in their population than both previous British studies. Accordingly, they also found a

Table 12.4 Prevalence of Anorexia Nervosa in Special Groups

Approximate Period Surveyed	Prevalence (%)	Population Base (N=total number surveyed)	Method of Recognition	Authors and Date of Publication
1977	5.4	Professional dance students in Canada (N=112)	E.A.T. and diagnostic criteria of Feighner	Garner and Garfinkel (1978) (19)
1979	6.0	Professional dance students in Canada (N=183)	E.A.T. and diagnostic interview	Garner and Garfinkel (1980) (20)
	7.6	Overall		
	3.8	More competitive setting (N=103)		
	3.5	Less competitive setting (N=80)		
		Modeling students (N=56)		
1981	2.0	Members of the British Dietetic Association (N=760)	Questionnaire	Morgan and Mayberry (1983) (21)
	1.4	Age 20-24		
	4.7	Age 25-29		
		Age 30-34		
1983	0.7	Women shoppers in USA (N=300)	Questionnaire based on DSM III	Pope et al (1984) (10)

higher percentage (22.0%) of females scoring in the anorexic range. Interestingly, the majority of females scoring in this range had a weight problem related to being overweight rather than underweight. It would then appear that the E.A.T. scale used alone would identify a large number of individuals with maladaptive attitudes toward food and maladaptive patterns of eating who may be suffering from mild or moderate forms of anorexia nervosa, bulimia, or obesity. Leichner et al [30] then made an attempt to increase the specificity of their survey by combining the high E.A.T.'s scores with percentage weight deviation from the median. They thus identified 0.11% of the males and 0.75% of females who scored in the anorexic range as well as had a percent weight deviation of 20% or less from median. These numbers are similar to those identified by Crisp et al [15]. Using a weight deviation of -4% to less than -19% from median, another 0.95% of males and 4.2% of females were identified. The majority of this population may be mild to moderate cases of anorexia. These numbers are in keeping with the numbers suggested in the less-stringent student population prevalence studies. Further development of the scale in terms of cutting scores as well as the addition of some other items and information regarding height and weight may further in-

crease its specificity. Further work is also needed in studying the eating patterns of patients with psychiatric and medical disorders that might affect eating (eg, depression and diabetes).

DEMOGRAPHIC VARIABLES

Sex

Table 6 reviews the sex distribution among anorexic patients from 1932 to 1980. The majority of these studies were based on populations of anorexics who were in treatment. Only the study by Robins, which reported sex prevalence rates among the 18-or-older general population, found no significant differences between the sexes. Unfortunately, their overall prevalence rate was also much lower than that in many other studies, suggesting that their criteria may have been excessively strict. The range of male percentages in the other studies was from 0% to 29.2%, with the majority of studies from 3.9% to 14%. It would therefore seem fair to conclude that most patients being treated for severe anorexia nervosa are female. Except for the study by Robins, there does not seem to be any significant trend suggesting that the proportion of males has been increasing. However, since the overall prevalence of the illness

Table 12.5 Results of Studies Using the Eating Attitude Test (E.A.T.)

Mean E.A.T. Score	Population Description (N=total number surveyed)	Authors and Date of Publication
58.9	Anorexia nervosa (N=33) x age = 22.5	Garner and Garfinkel (1979) (24)
15.6	Normal controls (N=59) x age = 21.8	
16.5	Obese (N=16)	
11.4	Recovered anorexia nervosa (N=9) (Canada)	
25.6	Dance students (N=183) x age = 18.6	Garner and Garfinkel (1980) (20)
13.7	Music students (N=35) x age = 15.2	
15.4	Normal control students (N=81) Canada x age = 21.5	
7.6	English college studies (N=132) Age = 16-22	Button and Whitthouse (1981) (25)
12.0	Female (N=446) Age = 16-22 6.3% in anorexic range (Britain)	
49.8	Female respondents to an advertisement in a popular women's magazine (N=499) 89% in anorexic range (England)	Fairbun and Cooper (1982) (26)
58.1	Anorexia nervosa (N=22) x age = 20.2	Srikameswaran et al (1984) (27)
59.6	Bulimia (N=17) x age = 21.5	
17.0	Control (N=44) x age = 20.6 Canada	
11.4	Consecutive female attenders (younger than 40) of a family planning clinic (N=669) 6.0% in anorexic range (England)	Cooper and Fairbun (1983) (28)
9.6*	English 15-year-old school girl (N=262) *E.A.T. (26 items) 6.9% in anorexic range (Britain)	Mann et al (1983) (29)
17.5	Canadian high school and College students (N=4649)	Leichner et al (1984) (30)
23.5	Males (N=2297) Females (N=2404) 5.7% of males in anorexic range; 22.3% of females in anorexic range (Canada)	

Table 12.6 Demographic Variables for Anorexia Nervosa—Sex

Approximate Period Surveyed	Percentage of males	Population (N=anorexic cases)	Method of Recognition	Authors and Date of Publication
1930-1953	11.0	Case reports USA (N=473)	Literature review	Bliss and Branch (1960) (3)
1932-1952	10.5	Anorexic patients attending the Maudsley Hospital England (N=38)	Hospital records	Kay and Leigh (1954) (31)
1942-1964	14	In and outpatients, USA (N=43)	Psychological evaluation	Bruch (1966) (32)
1962-1973	7.5	Anorexics admitted to a London Hospital (N=173)	Interviews with families	Crisp and Toms (1972) (33)
1966-1969	6.7	General population Scotland (N=30)	Case registers	Kendell et al (1973) (7)
1960-1969	29.2	Monroe county— anorexic patients drawn from general population (N=24)	Case registers	
1965-1974	0.0	Anorexic patients drawn from general population (N=8)	Case registers	
1960-1974	9.5	Patients from three hospitals, USA (N=42)	Weight loss without organic cause—15% at least	Warren and Vande Wiele (1973) (34)
1966-1972	4.3	Anorexics attending a Student Health Center, England (N=23)	Psychiatric assessment	Duddle (1973) (35)
1920-1972	6.4	Anorexics from hospital population, USA (N=94)	Charts from general and psychiatric hospitals	Halmi (1974) (36)
1959-1966	7.3	Anorexics in metabolic unit, London, (N=41)	Diagnostic criteria for anorexia nervosa	Morgan and Russell (1975) (37)
1956-1975	4.9	Patients treated in the United Birmingham Hospitals (N=206)	Records of general practitioners and psychiatrists, checked according to criteria for anorexia nervosa	Husan and Tibbetts (1977) (38)
1956-1969	3.6			
1970-1975	5.7			
1960-1969 1970-1976	27.0	Monroe County, New York (N=53) (1960-69 N=22) (1970-76 N=31)	Diagnosed anorexics from psychiatric case registers and hospital records	Jones et al (1980) (8)

Table 12.6 Demographic Variables for Anorexia Nervosa—Sex (continued)

1953-1979	6.7	Anorexic patients attended by 17 psychiatrists, Malaysia (N = 30)	Questionnaires given to 17 psychiatrists for their patients	Buhrich (1981) (12)
1958-1976	4.5	Anorexic patients treated in different settings, Norway (N = 133)	Diagnostic interviews	Basse and Eskeland (1982) (39)
1977	4.2	Anorexic patients in insitute of psychiatry, Copenhagen (N = 24)	Feighner's criteria in judgements of two psychiatrists	Fichter et al (1982) (40)
1970-1981	3.9	Anorexic referrals to clinics (N = 276)	Diagnostic interviews	Garfinkel and Garner (1982) (41)
1966-1981	14.0	Hospitalized anorexic patients Canada (N = 50)	Hospital chart analysis	Dongier and Samy (42) (1983)
1956-1975	0.0	Case reports of anorexic patients in a region in Switzerland (N = 65)	Hospital registers	Willi and Grossmann (1983) (9)
1977-1982	7.0	Anorexics treated in Phipps service, Baltimore (N-140)	DSM III	Andersen and Mickalide (1983) (43)
1976-1977	5.4	Patients identified as anorexics in 35 medical institutions, Japan (N = 316)	According to list of symptoms and hospital charts	Suematsu et al (1983) (13)
1980	31.0	18 or older general population (N = 6)	Diagnostic interview schedule (DIS) and DSM III diagnostic classification	Robins (1984) Unpublished manuscript

seems to be increasing, the actual number of males with anorexia nervosa has also been increasing at a similar rate as females. This observation may suggest that the factors felt to be causative may have increased in quantity but have not changed in quality over the past few decades. Andersen [43] has challenged these observations by suggesting that male anorexics tend to be misdiagnosed more often than female anorexics. Reasons that may account for this may include the fact that for many years the distinctive physiological symptom of amenorrhea was felt to be crucial in the diagnosis of anorexia nervosa, thus leading clinicians not to include this diagnosis in the differential of emaciated males. Also males

have been known to seek medical attention less often than females [43]. As these patients already tend to avoid medical attention, it may be that males are even stronger in this resistance and hence less often noted.

Age

Information regarding the variable of age is summarized in table 7. This table presents the findings of studies carried out from 1932 to 1982. Again, this data reflects the age of onset of cases that have reached the attention of health care professionals. Among this population it would appear fairly safe to conclude that is the majority of cases, onset is during the early teens and

Table 12.7 Demographic variables for Anorexia Nervosa—Age

Approximate Period Surveyed	Age	Population (N-anorexic cases)	Method of Recognition	Authors and Date of Publication	
1932-1952	Age of onset: five patients > 16 three patients < 35 70% before age 26	Anorexic patients attending Maudsley Hospital (N=34)	Hospital records	Kay and Leigh (1954) (31)	
1881-1952	Range 31-85 average age 21-1/2 years	Case reports U.S.A. (N=245)	Literature review	Bliss and Branch (1960) (3)	
1942-1964	Onset: females 11-28 males 12-14	In and out patients, U.S.A. (N=43)	Psychological evaluations	Bruch (1966) (32)	
1931-1960	Onset: range 11-26; for 85% range 13-20; 10% (nine cases) at age 21 or after three cases over age 25; one at age 34; five cases before age 13	All females admitted to hospital for anorexia nervosa from a well defined region in south Sweden (N=94)	Case registers; interviews; questionnaires	Theander (1970) (6)	
1960-1971	Range 10-26 mean 13:	Patients admitted to three hospitals U.S.A. (N=42)	Weight loss of at least 15% without organic cause	Warren and Vande Wiele (1973) (34)	
1966-1969	27 females between age 15-34	Anorexic patients drawn from general population register (N=44) Scotland	Case registers	Kendell et al (1973) (7)	
1960-1969	Eight females 15 three females 34 mean age 22.2, median between 15-19	Anorexic patients drawn from general population, Monroe County (N=24)	Case register	Kendell et al (1973) (7)	
1965-1971	Seven between 15-34 mean age 21.6	Anorexic patients drawn from general population Camberwell (N=8)	Case registers		
1920-1972	Onset: 13% over age 25 8% before age 10; 31% between age 10-15 47% between age 16-25	Anorexic patients from hospital population U.S.A. (N=94)	charts from general and psychiatric hospitals	Halmi (1974) (36)	
1959-1966	Range 12.8-47, mean 21.5, onset between 11-40 mean 15.3 = 3.14	Anorexics admitted to a metabolic unit, London, (N=41)	Diagnostic criteria for anorexia nervosa	Morgan and Russell (1975) (37)	
1960-1969	males 0-14 2 15-24 4 25-34 - 15-34 - 35-44 -	females 9 (56%) 3 2 2 2	Anorexic patients drawn from register - Monroe County, New York (N=53)	Psychiatric case register records	Jones et al (1980) (8)
1970-1976	0-14 1 15-24 1 25-34 - 35-44 -	10 (34%) 15 (52%) 3 1			

Table 12.7 Demographic variables for Anorexia Nervosa—Age (continued)

Approximate Period Surveyed	Age	Population (N-anorexic cases)	Method of Recognition	Authors and Date of Publication
1953-1979	Age 10-14 1 case 15-20 11 females 1 male 21- 25 13 females 1 male 26-30 3 females	Patients attended by 17 psychiatrists Malaysia (N = 27)	Questionnaire given the 17 psychiatrists for their patients	Bhurich (1981) (12)
1977	Range 13-29	Anorexic patients in an inpatient ward in institute of psychiatry, Copenhagen	Feighner's criteria and judgement of two psychiatrists	Fichter et al (1982) (40)
1970-1975 1976-1981	Age of onset 12-18 Age of onset 19-22	Referrals to program Canada (N = 287)		Garfinkel and Gardner (1982) (41)
1976-1977	Onset—mid teens to early twenties, 5.4% (17 patients) over age 31	Anorexic patients in 35 medical institutions, Japan (N = 316)	List of symptoms applied to hospital charts	Suematsu et al (1983) (13)
1966-1981 1966-1976 1972-1981	14.2 mean age 13.5 years average 15 years average	Patients hospitalized Canada (N = 50)	Hospital chart analysis	Dongier and Samy (1983) (42)
1956-1975 1956-1958 1963-1965 1973-1975	General average age of onset 16.9 Average age of onset 16.9 Average age of onset 16.9 Average age of onset 16.8	Patients from most clinics in a Swiss region (N = 65)	Case histories	Willi and Grossmann (1983) (9)
1981	Range 20-34	Members of the British Dietetic Association (N = 760)	Questionnaire about common gastrointestinal diseases	Morgan and Mayberry(1983) (21)
1963-1978	Age range 15-44, mean 24.6; Age at onset 11-12, mean 14.0	Anorexic patients treated in three hospitals, Germany (N = 21)	Files, diagnosed according to Feighner's criteria	Steinhausen and Glanville (1983) (45)
1977-1982	Range 18-47, average 29.2; six cases between age 18 to 26	Male anorexics treated in Phipps service, U.S.A. (N = 10)	DSM III	Anderson and Michalide (1983) (43)
1980	18-44 no consistent trend	18 or older general population (N = 6)	Diagnostic interviews schedule (DIS) DSM III	Robins (1984) Unpublished

Table 12.8 Demographic Variables for Anorexia Nervosa—Socioeconomic Variables

Approximate Period Surveyed	Social Class	Population (N=anorexic cases)	Method of Recognition	Authors and Date of Publication
1962-1964	I = 14, II = 23, III, IV = 6 (II-includes 3 males) III, IV-includes females)	In- and outpatients USA (N = 34)	Psychological evaluation	Bruch (1966) (32)
1956-1975	II = 3, III = 5	Anorexics treated in United Birmingham Hospitals (N = 8)	Records of general practitioners, and psychiatrists, checked according to criteria for anorexia	Hasan and Tibbetts (1977) (38)
1959-1966	I, II = 65.9% (17.9% in general population)	Anorexics admitted to a metabolic unit London (N = 41)	Diagnostic criteria for anorexia nervosa	Morgan and Russell (1975) (37)
1961-1969	II, III > IV, V not statistically significant	Female anorexics drawn from general population, Scotland (N = 38)	Case registers	Kendell et al (1973) (7)
1960-1969	No statistically significant difference in distribution from general population	Anorexics drawn from general population, Monroe County, (N = 24)		
1965-1969	I = 3, II = 2 high significant upper class bias	Anorexics drawn from general population Camberwell (N = 8)		
1960-1969	44.4% upper class (N = 24)	Monroe County, New York	Case registers	Jones et al (1980) (8)
1970-1976	I = 5, II = 14, III = 10 (N = 29)	Anorexics drawn from general population record (N = 53)		
1953-1979	I, II = 12, III = 13, IV, V = 2 (I, II 2 males)	Anorexic patients attended by 17 psychiatrists, Malaysia (N = 27)	Questionnaire given to 17 psychiatrists for their patients	Buchrich (1981) (12)
1962-1972	I, II = 50%, III, IV, V = 50%	Male anorexics in St. George Hospital, England (N = 12)	Interviews with families	Crisp and Toms (1972) (33)
1963-1978	I, II = 5%, III = 81%, IV, V = 14%	Patients treated in three hospitals in West Germany (N = 21)	Files, diagnosed according to Feighner's criteria	Steinhausen and Granville (1983) (45)
1966-1981	No difference	Patients hospitalized Canada (N = 50)	Hospital chart analysis	Dongiers and Damy (1983) (42)
1970	I and II	Referred female cases of anorexia nervosa, England (N = 25)	Questionnaire	Russell (1972) (46)
1970-1981		Referrals to special program	Diagnostic interviews	Garfinkel and Garner (1982) (41)

Table 12.8 Demographic Variables for Anorexia Nervosa—Socioeconomic Variables (continued)

Approximate Period Surveyed	Social Class	Population (N=anorexic cases)	Method of Recognition	Authors and Date of Publication
1970-1975 1976	I, II = 70.6%, III, IV = 29.4% I, II = 52.0%, III, IV = 48.0%			
1977-1982	Two-third of professional managerial social classes	Male anorexics treated in Phipps Service, Baltimore (N= 10)	DSM III	Anderson and Mickalide (1983) (43)
1976	I, II = 50%, III = 27%, IV, V = 23%	Patients treated in a London Hospital (N= 56)	Interviews with families	Kalucy et al (1977) (47)

early 20s. Individual case reports have suggested a possible range from 7 years to 85 years of age [3]. It is difficult from this information to assess whether the age of onset of anorexic nervosa has indeed been increasing recently as has been suggested by Garfinkel and Garner [41]. The occurrence of anorexia nervosa in older women has been well documented by Bliss and Branch [3] in their review of cases from 1818 to 1952. Hence, older presentations are not a new phenomenon. Whether there is a true increase in the incidence of anorexia nervosa in the older population or whether this increase reflects the "coming out of the closet" of older patients is difficult to assess. It is probable that the increasing information through the media and popular press has caused a greater awareness of the disease among patients and health care professionals. And this may also be leading to the diagnosis of mild to moderate cases of anorexia nervosa that previously might have been tolerated by health care professionals and families [44]. Arguing for a true increase in the incidence of anorexia nervosa in the older age-group is what would seem to be an increase in the sociocultural pressures on women in all ages to become slim and maintain youthful figures.

Socioeconomic Status

Information regarding the distribution of the socioeconomic status of the families of anorexic patients is summarized in table 8. This table presents the findings of studies carried out from 1942 to 1982. Although overall the figures presented tend to indicate a preponderance of upper social classes, it is also clear from the earliest reports that significant numbers of anorexics came from lower socioeconomic backgrounds. Several authors have expressed their opinion that the disorder

is spreading across the social groups. However, it is difficult from the information available to know whether this is a true change. In fact, the study by Jones et al [8] reported finding a higher percentage of upper social class patients between 1970 and 1976 (73%) than between 1960 and 1969 (44.4%). In order to explain a change in the distribution of the illness, one would have to assume that factors implied as being associated with anorexia nervosa such as attitudes and practices of child rearing, attitudes toward sexuality, food, body weight, high achievement orientations, and the availability of food are becoming more similar across the classes. Although this is quite possible, it is equally likely that the high preponderance among the upper social economic class may have been a reflection of the different ability that these parents and patients had in recognizing the illness and their ability to seek out professional expertise. Recently the amount of information distributed to the public as well as the number of treatment facilities available have increased. These factors, along with improved diagnostic skills among health care professionals, may be contributing to the evening-out of the distribution among socioeconomic groups. For example, an emaciated youth from a lower socioeconomic class may have previously been diagnosed as malnourished, whereas now increased sensitivity to anorexia nervosa may allow for appropriate detection. Also of support to this trend was the observation by Leichter et al [30] that there were no significant differences between the numbers of students who scored in the anorexic range in the various socioeconomic classes. More comprehensive studies of the patterns of referrals to clinics and general population surveys are required to monitor these trends.

Table 12.9 Educational Status of Anorexics

Approximate Period Surveyed	Education	Population (N=anorexic cases)	Method of Recognition	Authors and Date of Publication
1931-1960	65% (61 patients) more than elementary education; almost 40% matriculation level 17% academic education; high correlation between socio-economic status of parents and the level of education	Female patients from a defined region in south Sweden (N = 94)	Hospital archives and interviews of patients or families and questionnaires and psychological tests	Theander (1970) (6)
1959-1966	61% high academic achievements; 32% higher education	Anorexic patients admitted to a metabolic unit (N = 41)	Diagnostic criteria for anorexic nervosa	Morgan and Russell (1975) (37)
1956-1975	Significantly more often attended upper level high schools than average	Female anorexics hospitalized in most clinics in a Swiss region (N = 6)	Case histories	Willi and Grossmann (1983) (9)
1966-1972	All did well academically	Anorexic patients attended at Student's Health Center Manchester (N = 23)	Psychiatric assessment criteria by Dally (69)	Duddle (1973) (35)
1970	Boarding school education	Diagnosed cases of anorexia nervosa, England (N = 25)	Questionnaire and clinical interviews	Russell (1972) (46)
1970-1972	72% above average scholastic performance; 26% average; 8% below average	Anorexics from general psychiatric hospitals, USA (N = 94)	Charts and diagnostic criteria by Feighner	Halmi (1974) (36)
1980	No consistent patterns	18 or older general population USA (N = 9,543)	Diagnostic interview schedules (DIS) and DSM III classification	Robins (1984) unpublished

Educational Status

Information regarding the level of education of anorexic patients is summarized in table 9. This table presents the findings of studies carried out from 1931 to 1980. The methods of measuring the level of education in these samples were diverse. Nevertheless, there seemed to be an almost unanimous finding that these patients were more successful than average in their education. This observation may be interpreted to indicate high intelligence, high self-expectations, a high drive toward perfection, and/or high wish to please others (in particular parents). Again, further work is necessary to elucidate these features in the context of the general population surveys.

Sibship

The information regarding sibship is summarized in table 10. This table presents the findings of studies carried out from 1942 to 1981. From this review there would appear to be some trend favoring an association between anorexia nervosa and being first or second children. Five out of nine studies in the table found 25% to 50% of anorexic patients to be firstborn. Only children tended not to be included, thus perhaps minimizing these figures. Three studies found 32% to 40% of anorexic patients to be second children. In trying to explain this finding, one might speculate that firstborn children may be expected to carry more responsibility within the family. They may also be the ones on which the parents

Table 12.10 Sibship

Approximate Period of Survey	Sibship	Population (N=anorexic cases)	Method of recognition	Authors and Date of Publication
1931-1960	15% (14 patients) only child; 25% (24 patients) first born; 29% (27 patients) youngest of two or more—0.8 of them 6 years after their next oldest sibling; 31% (29 patients) middle; 20 patients had only sisters; 21 patients had only brothers; number of sisters and brothers equal in this group	Female patients from a defined area in south Sweden (N=94)	Hospital archives and interviews of patients or families questionnaire and psychological tests	Theander (1970) (6)
1942-1964	Eight patients were only children; 17 (37%) were oldest; 11 were middle; seven youngest	In and outpatients U.S.A. (N=43)	Psychological evaluation	Bruch (1966) (32)
1956-1975	Five patients—first born; four patients—second born; one patient—youngest of three	Male patients treated in United Birmingham Hospitals (N=10)	Records of general practitioners and psychiatrists checked according to criteria of anorexia nervosa	Hasan and Tibbetts (1977) (38)
1956-1975	No specific birthrank in majority of patients, girls predominated	Females hospitalized in most clinics in a Swiss region (N=65)	Case histories	Willi and Grossmann (1983) (9)
1962-1972	Seven first born, five second born	Male patients in a London hospital (N=13)	Interviews with families	Crisp and Toms (1972) (33)
1966-1972	Four only children	Anorexic patients attended at Student's Health Center, Manchester (N=23)	Psychiatric assessment (criteria by Dally 69)	Duddle (1973) (35)
1966-1981	Birth rank 2.37	Hospitalized patients Canada (N=50)	Hospital chart analysis	Dongier and Samy (1982) (42)
1970	Second born in family	Diagnosed cases of anorexia nervosa, England (N=25)	Questionnaire—clinical interviews	Russell (1972) (46)
1920-1972	40% first born, 32% second; 19% third, 17% fourth or later	Anorexic patients from general and psychiatric hospitals, USA (N=94)	Charts and diagnostic criteria by Feighner	Halmi (1974) (36)

Table 12.11 Race

Approximate Period Surveyed	Race	Population (N=anorexic cases)	Method of Recognition	Authors and Date of Publication
1953-1979	19 Chinese 8 Indians 1 Malayan 2 Eurasians	Patients referred to psychiatrists Malaysia (N=30)	Reports on questionnaires	Buhrich (1981)(12)
1960-1971	40 white 1 black 1 Chinese	Patients admitted to three hospitals USA (N=42)	Weight loss of at least 15% without organic cause	Warren and Vande Wiele (1973) (34)
1980-1981	4 blacks	Consultations to specially clinic Canada (N=120)	Diagnostic interviews	Garfinkel and Garner (1982) (41)
1976-1977	Japanese	Outpatients and inpatients in 35 medical institutions (N=424)	Hospital charts and a list of symptoms similar to DSM III	Suematou et al. (1983) (13)
1980	Lower in blacks	18 or older general population USA (N=9.543)	Diagnostic interview schedule (DIS) and DSM III criteria	Robins (1984) unpublished

project their first expectations. The combination of high parental expectations and family responsibilities may be associated with this disorder. Unfortunately, it is difficult to interpret the importance of these observations, because none of the studies compared these statistics with those of the general population.

Race

Information regarding race is summarized in table 11. The table presents the findings of studies and case reports carried out from 1953 to 1981. It appears clearly that the prevalence of anorexia nervosa in the black population in the United States was relatively low. Until 1984, only 11 cases were presented in various scientific publications. Garfinkel and Garner [41], who did not have any referrals of blacks until 1979, reported four cases out of 120 since then. Pumariega et al [48] reported two cases referred to him in six months. These authors raised the question of whether the incidence of anorexia nervosa was rising in the black population. Incidence could be seen as rising because of increased awareness regarding anorexia nervosa or the increasing use of the health care system by blacks [48]. Alternatively, it could also be due to sociocultural changes. Attitudinal differences toward body weight between white and black populations were studied by Huememann et

al [49] in 1966 in California High Schools. They found that black girls differed from white and Chinese in relation to their body size. Black girls were more satisfied with their figures. Many of them considered themselves about right or even a little too thin. They were more realistic in estimating their body size than other ethnic groups. Nevertheless, there was a steady increase with age in the number who thought they were too fat. The importance of sociocultural factors was also highlighted by Ikemi et al [11], who suggested that westernization of Japan and changes in the traditional family system has been associated in the increase of anorexia nervosa in that country.

Outcome Studies

Although most epidemiological studies do not take the influence of outcome into consideration, it is likely that as more comprehensive treatment programs strive for a more global improvement of the patient than just weight restoration, the number of patients recognized as suffering from the disorder and various stages of treatment will increase.

The problems with outcome studies have been well reviewed by Garfinkel and Garner [41]. They are in many ways similar to the ones outlined with epidemiological studies in this chapter. Overall, Garfinkel and

Garner's review of long-duration evaluations shows "that over 40% of patients have recovered and 30% are considerably improved at follow-up. However at least 20% are unimproved or seriously impaired and 9% have died as a result of the illness" (pg.329, 41). It is becoming evident that those patients who are unimproved or only partially improved need long-term treatment. The implications of this are that if the number of referrals to specialty clinics increases at a rate greater than that of complete cures, the number of patients known with this disorder and in treatment is bound to increase until a certain steady-state is achieved. This phenomenon may in part explain why the point prevalence of these disorders is increasing in treatment centers.

CONCLUSIONS

A significant amount of work has been done since the late 1800s regarding the epidemiology of anorexia nervosa. Changes in medical interest and sociocultural changes have influenced the quantity and the quality of this work. The last decade has seen an increased sophistication and interest in these studies. In the light of reviewing this work where would appear to be two consistent findings. First, despite various methodologies, almost all studies point to an increase in the number of patients presenting for treatment to mental health care professionals. The degree to which this may reflect an increase in the incidence of this disorder is yet to be established. Repeated work using improved criteria and validated questionnaires may further clarify this question. Second, most patients presenting to health care professionals are female. There is little convincing evidence to argue that this is primarily due to a biological factor. Rather, the evidence seems to favor the influence of specific sociocultural factors on women. The influence of other variables discussed in this chapter are less convincingly established and may in fact be in flux. That these factors may be changing is not surprising if one considers the important role of sociocultural factors in influencing the symptomatology of mental disorders. Hence, as cultural pressures for slimness further spread across all socioeconomic classes and into underdeveloped countries, one might expect further changes. Finally, recent works using validated questionnaires in general student populations clearly highlight the high rate of maladaptive eating patterns among today's youth. The rates of possible mild to moderate cases of anorexia nervosa identified through these methods is alarming.

DIRECTION FOR FUTURE WORK

Work remains to be done in the following areas:

1. The development of better screening procedures

for the general population. Further validation studies of the instruments used in the identification and assessment of eating disorders are required. Further refinements aimed at increasing their specificity will greatly help to more accurately determine the prevalence of this disorder in the general population.

2. General population surveys. Most of the work that has been published up to now has focused on the high-risk groups of female high school students and college students. Yet it is becoming evident that this disorder also occurs among the male population and the older general population in significant numbers. More comprehensive studies are required in these groups.,
3. The development of prospective studies. All the work that has been reviewed in this chapter concerns primarily retrospective studies. Prospective studies are needed to verify our understanding of the significant etiological factors for these disorders. Repeated surveys of the general population with closer follow-up of those identified at high risk are needed.
4. Preventive measures. Preventive programs need to be developed in the context of evaluation instruments to measure their impact in terms of the incidence of anorexia nervosa. A more aggressive approach is needed in high schools and colleges to correct maladaptive eating patterns based on insufficient knowledge of the risk associated with the excessive valuing of slimness. The media generally need to be continuously informed and warned of the potential damages that some of their advertising practices can lead to an needs to be further encouraged to be more critical of the material they present to the public.

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