

The prevalence of disordered eating behaviours and attitudes in adolescent girls

Jennifer L. Fear,

The Princess Margaret Hospital

Cynthia M. Bulik,

University of Canterbury

Patrick F. Sullivan,

Christchurch School of Medicine

The prevalence of disordered eating behaviours and the nature of body size estimation was examined in adolescent girls in Christchurch. Differences in these behaviours between single-sex and co-ed schools were also examined. Data were collected from 363 adolescent girls from three co-ed and two single-sex secondary schools. Each subject completed the Eating Disorder Inventory-2 and the Figure Rating Scale. The results revealed a high prevalence of dieting (54%), bingeing (38%) and purging (up to 12%) in adolescent girls. The majority of the students (71%) desired to be a smaller size than they perceived themselves to be. There were no differences between single-sex and co-ed schools on the core disordered eating behaviours. This study showed that there are high rates of disordered eating behaviours among adolescent girls and that high body mass index and low socioeconomic status were associated with greater eating disordered attitudes. The findings illustrate the need for further research on prevention of unhealthy eating behaviours and body image concerns that have become normative among young women.

The majority of adolescent girls in Western societies feel dissatisfied with their body shape and size, want to lose weight and have attempted dieting (Davies & Furnham, 1986; Koff & Rierdan, 1991; Wadden, Brown, Foster, & Linowitz, 1991; Wardle & Marsland, 1990; Worsley, Worsley, McConnon, & Silva, 1990). For many young women, dieting has come to represent a "normal" eating style (Hill, 1993); for example, 21% to 53% of adolescent girls have been on a weight reducing diet (Davies & Furnham, 1986; Koff & Rierdan, 1991, Leon, Perry, Mangelsdorf & Tell, 1989; Wardle & Marsland, 1990; Worsley, Worsley, McConnon, & Silva, 1990). An American study found that the majority of teenage girls had adopted a "dieting mentality" (Koff & Rierdan, 1991). Concerns about weight and body size also appear to be emerging at

increasingly younger ages (Benbrook, 1989; Koff & Rierdan, 1991; Wardle & Marsland, 1990; Hill, 1993).

Research investigating binge eating in adolescent girls in other Westernised countries has found that 17% of teenagers binge at least once a week (Johnson, Lewis, Love, Lewis, & Stuckey, 1984; Moss, Jennings, McFarland, & Carter, 1984). Thirteen percent of adolescent girls reported purging of some sort on an occasional basis (Hsu, 1990), with 7% to 11% reporting self-inducing vomiting, 4% to 8% abusing laxatives, 3% to 4% abusing diuretics and 3% to 13% using diet pills (Ben-Tovim, Subbiah, Scheutz, & Morton, 1989; Johnson et al., 1984; Killen, Taylor, Telch, et al., 1986; Moss et al., 1984).

Dieting has been postulated to be a risk factor for the development of potentially dangerous eating disorders such as anorexia nervosa and bulimia nervosa. Eating disturbances exist on a behavioural continuum ranging from simple dieting to subclinical to diagnosable eating disorders. 'Normal' adolescent dieting provides an entree into an eating disorder if such dieting is intensified by adolescent turmoil, low self- and body-concept and poor identity formation (Hsu, 1990). Genetic, psychological, biological and family factors may play an aetiological role as they moderate the pathway from dieting to frank eating disorders (Kendler, McLean, Neale, Kessler, Heath & Eaves, 1991; Hsu, 1990). Young girls who feel most negatively about their bodies are more likely to have developed eating problems two years later (Attie & Brooks-Gunn, 1989). Body dissatisfaction, dieting, bingeing and purging are predeterminants to full-blown clinical syndromes which can seriously damage a young woman's physical and psychological well-being.

The prevalence of eating disorders among New Zealand women is comparable to other Western countries. The lifetime prevalence of anorexia nervosa in a probability sample of women in Christchurch was 0.3% (Wells, Bushnell, Hornblow, Joyce, & Oakley-Browne, 1989). The lifetime prevalence of bulimia in women from this sample between the ages of 18-44 was 2.6% (Bushnell, Wells, Hornblow, Oakley-Browne, & Joyce, 1990).

The age of risk for developing anorexia and bulimia

nervosa tends to be the early teens to early twenties. These disorders often cluster in high school and university populations. One area that has received sparse research attention is whether single-sex or co-ed environments are especially conducive to the development of eating-related pathology. Competing hypotheses on this question depend on which factors one views as potential initiating or maintaining factors for eating disorders. For example, research comparing the social climate and environment of single-sex and co-ed schools tends to suggest that single-sex schools are more competitive, disciplined and academically oriented, whereas co-ed schools place more emphasis on positive social relations (Dale, 1974; Riordan, 1990; Schneider & Coutts, 1982). Those who believe that perfectionism and a drive for achievement are characteristic of individuals with eating disorders (Bruch, 1978) may suggest that the high-pressured single-sex schools would be more conducive to the development of eating disorders. Alternatively, those who espouse a more sociocultural perspective focusing on young girls' desire to be thinner and more attractive would suggest that the co-ed environment may be more conducive to eating disorders. For example, Berg (1988) found that students living in co-ed residence halls in Australian universities had higher scores on body dissatisfaction and drive for thinness and exhibited more bulimic symptomatology than those living in single-sex halls. The author attributed this to factors associated with living in close association with male peers.

The current study investigated the prevalence of disordered eating behaviours and attitudes in a large sample of adolescent girls in Christchurch. In addition, girls attending co-ed schools were compared to those attending single-sex schools to determine any differences in eating pathology or attitudes.

Method

Subjects

Three hundred and sixty three female fourth-form students from five state secondary schools in Christchurch participated in this study. Two of the schools were single-sex and were the only two single-sex public schools in Christchurch. The three co-ed schools were chosen from a register of Christchurch high schools and were selected because the students represented a range of socioeconomic levels.

Procedure

Informed consent was obtained from all subjects and their parents. We chose to administer the questionnaires in an anonymous fashion given how sensitive questions about body weight and shape can be to girls in this age group. Schools differed in terms of how they chose to administer the anonymous questionnaires.

Subjects completed a booklet comprising demographic questions (age, ethnicity, school, and parental occupation and education), the Eating Disorder Inventory-2 (Garner, 1991) and the Figure Rating Scale (Stunkard, Sorensen, & Schulsinger, 1983). Ethnicity was available for three of the five schools. Each subject was weighed and had her height

measured in her school uniform without shoes on *after* completion of the questionnaires to reduce the effect of weighing on responses to the questionnaires. This study was approved by the Human Ethics Committee of the Department of Psychology, University of Canterbury.

Test Materials

The Hollingshead Two-Factor Index of Social Position (Hollingshead, 1958) is a widely used measure of socio-economic status which is calculated based on father's and mother's occupation and education. A second rater independently coded each subject's responses. Any differences were discussed and a mutual decision was reached enabling a high degree of agreement between raters. If details of only one parent's occupation and education were provided then this was used.

The Eating Disorder Inventory-2 (EDI-2) (Garner, 1991) is a self-report measure of symptoms and cognitions associated with anorexia and bulimia nervosa. The EDI-2 was used to assess eating disorder symptomatology and subjects' eating behaviours and attitudes. Part one of the EDI-2 asks general questions about the frequency of dieting, bingeing and purging behaviours. Part two is a 91-item questionnaire that provides standardised subscale scores on 11 dimensions relevant to eating disorders. The first three scales measure the core cognitive and behavioural features of eating disorders (drive for thinness, bulimia, and body dissatisfaction). Five additional scales measure constructs that are hypothesised to be related to anorexia and bulimia nervosa (ineffectiveness, perfectionism, interpersonal distrust, interoceptive awareness, maturity fears). Finally, three experimental scales (asceticism, impulse regulation and social insecurity) have been included in this version of the EDI to assess their relevance to anorexia and bulimia nervosa. There is consistent evidence that the psychometric properties of the EDI-2 are sound and sensitive to clinical change (Garner, 1991).

The Figure Rating Scale (Stunkard et al., 1983) is a measure of body image perception. Subjects were presented with nine drawings of female figures ranging from very thin to very heavy. Subjects were asked to choose the figure that best illustrates their current appearance, the figure they would most like to look like and the figure they think would be most attractive to the opposite sex. The concurrent validity of the Figure Rating Scale is illustrated by its relation to measured Body Mass Index (BMI = weight/height) (Sorensen, Stunkard, Teasdale & Higgins, 1983).

Data analysis

Prevalence estimates are presented as means (standard deviations). Group comparisons were made using Student's t-test or the F-ratio as appropriate. Multivariate analysis of variance (MANOVA) was performed to compare results of single-sex and co-ed students on the EDI-2. Multivariate analysis of covariance (MANCOVA) was performed to examine the effect of type of school on the EDI-2 with BMI and SES as covariates. All analyses were performed with JMP (SAS, 1989).

Results

Response rate

All female students currently enrolled in the targeted fourth form classrooms were invited to participate. Due to the anonymous nature of the procedure, we were only able to estimate the participation rate. The participation rate was estimated by subtracting the expected number of absentees and an estimate of the number of students engaged in other activities (e.g., sports clubs) during the time the questionnaires were administered. Based on these calculations, the estimated participation rates across schools ranged from 85-90%.

Demographics

Age, Hollingshead social position scores and body mass index (BMI) are presented in Table 1. There were no significant differences in age between single-sex and co-ed schools. Girls in co-ed schools had significantly higher BMI and significantly lower SES than girls in single-sex schools. Sixty-nine percent of subjects had a BMI that was within the normal range (BMI = 19-24) for their age, 18% had a BMI below and 13% had a BMI above the desirable range. Of the three schools for which ethnicity data were available, the majority of the subjects (77%) identified themselves as of European ancestry, 16% Maori or part Maori ancestry, 3% Samoan, and 4% other. There were no significant differences in the BMI [$F(4,167)=1.97, p=.086$] of subjects across ethnic groups. Although the differences in BMI and SES were significant, the effect sizes were small (BMI: $R^2=1.8$) and (SES: $R^2=6.6$).

Prevalence of disordered eating behaviour

Rates of dieting, bingeing and purging for the entire sample and by school type are presented in Table 1. Overall, fifty-four percent of subjects had dieted and the average age of first dieting was 12.9 years. Thirty-eight percent had binged. Other methods of purging and weight control reported included vomiting, laxatives, diet pills and diuretics.

There were no significant differences in rates of any of the core eating-related behaviours between single-sex and co-ed schools. There were also no differences in the number of girls who had started menstruating across the two groups.

The rates of dieting, bingeing and purging were also compared across ethnic groups. There was no significant difference in the prevalence of dieting and bingeing among European, Maori and Samoan subjects although Samoan subjects were significantly more likely to have induced vomiting to lose weight than European or Maori subjects. It must be noted that the sample size upon which this finding is based is extremely small (i.e., seven girls in the Samoan group).

Eating Disorder Inventory-2.

Table 2 presents subjects' mean EDI-2 subscale scores by school-type. The mean scores for the combined sample on all 11 EDI-2 subscales are comparable to those reported in other studies (Rosen, Silberg, & Gross, 1988; Shore & Porter, 1990), and within the range for normal adolescents. Eleven

percent of subjects scored above the specified cutoff score of 14 on the Drive for Thinness scale. This indicates that these students are highly preoccupied with their weight and could have an increased a priori probability of an eating disorder.

A MANOVA was conducted to compare the eleven EDI-2 subscale scores of students in single-sex and co-ed schools. The MANOVA was not significant [$F(11,340)=0.78, p=0.66$] indicating that the type of school was unrelated to variation in the EDI-2. Because SES and BMI differed significantly across groups, a MANCOVA was performed on the EDI-2 subscales with these variables entered as covariates. The overall MANCOVA for the EDI-2 was significant [Wilks $\lambda=0.68$; $F(33,952)=4.00, p<.00005$]. The main effect of type of school was not significant [$F(11,323)=0.89, p=0.54$], but the independent effects of both BMI [$F(11,323)=8.58, p<0.00005$] and SES [$F(11,323)=2.93, p<0.001$] were significant with higher BMI and lower SES being associated with higher scores on the EDI-2.

As the EDI-2 has not been validated on Maori or Pacific Island populations, comparisons by ethnicity were not performed.

Figure rating scale

Table 2 also presents subjects' mean ratings on the Figure Rating Scale. Subjects' mean rating for their current body was 39.2 (12.4) (range 17-90). The mean ideal body ratings was 31.1 (7.3) (range 10 -90). The mean rating of the ideal body as perceived by the opposite sex was 31.1 (7.6) (range 10-90). These scores indicate that on average, girls wished to be thinner than they perceived themselves to be and that they believed that boys preferred girls who were thinner than their own self-perceived size. Figure Ratings did not differ significantly by type of school.

Discussion

Disordered eating behaviours are common among adolescent girls in Christchurch. Over half (54%) of the adolescent girls sampled had already attempted dieting to lose weight and most had begun dieting before the age of 13. The rates of dieting found in this study are comparable to the findings of studies performed in other Western countries. If dieting is indeed a major risk factor in the development of eating disorders (Hsu, 1990), the high prevalence of dieting among young girls is of considerable concern.

Thirty-eight percent of the Christchurch girls sampled reported that they had had an episode of binge eating and those who had binged on average twice a week. Other studies which examined weekly bingeing in this age group found prevalence rates of approximately 17% (Johnson et al., 1984; Moss et al., 1984). The difference may be due to our asking about *ever* bingeing vs *weekly* bingeing and, in part due to the definition of binge used. In general, binge eating refers to the consumption of an objectively large amount of food with a sense of loss of control over eating. A binge is considered to be subjective if the amount of food eaten can not be regarded as unusually large by social comparison (Beglin & Fairburn, 1992). Whether subjects reported both objective and subjective binges is unclear; however, high rates of either

are of concern. High rates of objective binge-eating are concerning as this suggests an individual is already well-established in an eating-disordered pattern. High rates of subjective binges suggest that an individual has developed distorted cognitions about eating and may be at risk of developing further restrictive eating as well as objective binges in the future.

A high percentage of Christchurch girls sampled also reported purging by either self-inducing vomiting (12%), or to a lesser extent laxatives (2.5%), diet pills (2.2%) or diuretics (0.3%). The prevalence rates of purging reported in other studies are similar (Ben-Tovim et al., 1989; Johnson et al., 1984; Killen et al., 1986; Moss et al., 1984). It is possible, given that some individuals with particular issues about eating and weight may have chosen not to participate in this study, that these may underestimate the true prevalence of these behaviours in young girls.

Although only 13% of the subjects had a BMI that was above the recommended healthy range for adolescents, 71% chose an ideal figure that was thinner than the current figure they chose on the Figure Rating Scale. This indicates that the vast majority of young girls are dissatisfied with their body shape or weight and desire to be thinner. These sorts of attitudes toward body shape and weight fuel dieting behaviour.

Overall, no differences were found between girls attending single-sex and co-ed schools. In contrast, two variables that did differ across the type of school, namely BMI and SES, did have an effect on responses to the EDI-2 subscales. Higher BMIs and lower SES were associated with higher scores on the EDI-2. The higher BMI finding is intuitively obvious as it has been shown that those individuals who are larger tend to be most dissatisfied with their shape and weight and tend to be more at risk for dieting behaviour. The SES finding is counterintuitive as the majority of research suggests that eating disordered behaviour tends to cluster in the higher SES groups. In this study, lower SES was associated with higher scores on the EDI-2 suggesting a deviation from findings abroad and support for a trend for eating disordered behaviour to be

filtering throughout the socioeconomic spectrum.

It is of note that the prevalence of bingeing and purging did not differ across ethnic groups (with the exception of the preliminary finding of more vomiting for weight control in Samoan girls). Again, the absence of a significant difference on these measures suggests that eating problems are not confined to European girls. Very little is known about eating disorders in Maori and Pacific Island populations. It is conceivable that Maori and Pacific Island girls and women may be adopting the Western, Caucasian norm of thinness as their ideal despite the fact that Polynesian women tend to have larger body frames than Caucasian women (Russel & Wilson, 1991), making the thin ideal figure even more unrealistic and unattainable. This could place Polynesian women at increased risk for dieting and developing eating problems.

The relation among culture, SES and disordered eating behaviours and attitudes warrants further investigation. Eating disorders have been considered to be culture-bound syndromes, found primarily among wealthy Caucasian women (Pate, Pumariega, Hester & Garner, 1991). The results of many studies investigating the relation between culture and eating disorders indicate anorexia and bulimia are not confined to white upper-middle class girls and women. Eating disorders do occur in non-Caucasian individuals and culturally diverse ethnic groups (Davis & Yager, 1992; Pate et al., 1991). Immigrants from other cultures may adopt different eating behaviours and attitudes as they become acculturated into a developed Westernised society (Bulik, 1987; Hsu, 1990). It has been suggested that the ideal that thinness has come to symbolise in Western cultures is filtering into other ethnic groups as their cultural values and attitudes change to meet Western ideals (Pate et al., 1991). The findings of the present study indicate that disordered eating behaviours are not confined to a single ethnic group, race, or SES.

Several limitations must be addressed when interpreting these findings. First, the high schools studied were not randomly selected. As such, the generalisability of these findings to other high school students in New Zealand may

Table 1. Demographics and eating behaviours in single-sex and co-ed schools*

Variable	Total Sample (N=363)	Single Sex (n=184)	Co-ed (n=179)	Statistic [†]	p
Age	14.9 (0.4)	14.9 (0.4)	15.0 (0.4)	3.39	ns
BMI	21.6 (3.2)	21.1 (3.0)	22.0 (3.3)	6.66	.01
SES	40 (16)	36 (15)	44 (15)	24.2	<.00005
% past menarche	91%	93%	89%	1.19	ns
% binged	38%	37%	40%	0.50	ns
Ave. binges/week	2.3 (1.7)	2.5 (1.8)	2.2 (1.6)	0.72	ns
% vomited	12%	10%	13%	0.86	ns
% laxatives	2.5%	2.7%	2.3%	0.08	ns
% diet pills	2.2%	1.6%	2.8%	0.58	ns
% diuretics	0.2%	0%	0.6%	1.04	ns

* All values represent mean (standard deviation).

† Statistics reported are Student's t-tests for continuous variables and (df=1) for percentages

be limited. Second, as only state schools were studied, this study sheds no light on girls who attend private single-sex schools. Third, the absence of ethnicity data for some of the schools and the lack of relevant normed instruments for these populations reduced our ability to comment on the distribution of disordered eating behaviours and attitudes across ethnic groups. Fourth, the choice to conduct an anonymous study only allowed us to estimate rates of participation.

In summary, this study found high rates of disordered eating behaviours amongst fourth form girls in Christchurch. The rates of disordered eating did not differ across single-sex and co-ed schools; however, higher BMI and lower SES tended to be associated with higher scores on the Eating Disorders Inventory. Given the relatively high frequency with which disordered eating occurs in adolescent girls, and the potential for subclinical syndromes to progress to frank eating disorders, the need for research into effective prevention becomes clear.

References

- Attie, I., Brooks-Gunn, J. (1989) Development of eating problems in adolescent girls: a longitudinal study. *Developmental Psychology*, 25, 70-79.
- Beglin, S.J., Fairburn, C.G. (1992) What is meant by the term "binge"? *American Journal of Psychiatry*, 149, 123-124.
- Benbrook, A. (1989) *Diet related behaviours of pubescent children*. Dunedin: University of Otago, Master's thesis.
- Ben-Tovim, D.I., Subbiah, N., Scheutz, B., Morton, J. (1989) Bulimia: symptoms and syndromes in an urban population. *Australia and New Zealand Journal of Psychiatry*, 23, 73-80.
- Berg, K.M. (1988) The prevalence of eating disorders in co-ed versus single-sex residence halls. *Journal of College Student Development*, 29, 125-131.
- Bray, G.A. (1978) Definition, measurement, and classification of the syndromes of obesity. *International Journal of Obesity*, 2, 99-112.
- Bruch, H. (1978) *The Golden Cage*. Cambridge: Harvard University Press.
- Bulik, C.M. (1987) Eating Disorders in immigrants: Two case studies. *International Journal of Eating Disorders*, 6, 133-141.
- Bushnell, J.A., Wells, J.E., Hornblow, A.R., Oakley-Browne, M.A., Joyce, P. (1990) Prevalence of three bulimia syndromes in the general population. *Psychological Medicine*, 20, 671-680.
- Dale, R.R. (1974) *Mixed or single-sex school? vol. 3*. London: Routledge & Kegan Paul.
- Davies, E., Furnham, A. (1986) The dieting and body shape concerns of adolescent females. *Journal of Child Psychology and Psychiatry*, 27, 417-428.
- Davis, C., Yager, J. (1992) Transcultural aspects of eating disorders: a critical literature review. *Culture Medicine & Psychiatry*, 16, 377-394.
- Garner, D.M. (1991) *The Eating Disorder Inventory-2*. Florida: Psychological Assessment Resources.
- Hill, A.J. (1993) Pre-adolescent dieting: implications for eating disorders. *International Review of Psychiatry*, 5, 87-100.
- Hollingshead, A.B. (1958) *Social class and mental illness: a community study*. London: John Wiley & Sons.
- Hsu, L.K.G. (1990) *Eating Disorders*. New York, The Guilford Press.
- Johnson, C., Lewis, C., Love, S., Lewis, L., Stuckey, M. (1984) Incidence and correlates of bulimic behaviour in a female high school population. *Journal of Youth and Adolescence*, 13, 15-26.
- Kendler, K.S., MacLean, C., Neale, M., Kessler, R., Heath, A., Eaves, L. (1991) The genetic epidemiology of bulimia nervosa. *American Journal of Psychiatry*, 148, 1627-1637.
- Killen, J.D., Taylor, C.B., Telch, M.J., Saylor, K.E., Maron, D.J., Robinson, T.N. (1986) Self-induced vomiting, and laxative and diuretic use among teenagers. *Journal of the American Medical Association*, 255, 1447-1449.
- Koff, E., Rierdan, J. (1991) Perceptions of weight and attitudes toward eating in early adolescent girls. *Journal of Adolescent Health*, 12, 307-12.
- Leon, G.R., Perry, C.L., Mangelsdorf, C., Tell, G.J. (1989)

Table 2. EDI2 and Figure Rating Scale scores in single-sex and co-ed schools

Test and subscale*	Single sex	Co-ed	t	p
Eating Disorders Inventory 2				
Drive for thinness	5.4 (5.5)	5.3 (5.4)	-0.18	ns
Bulimia	2.3 (3.3)	2.2 (2.8)	-0.35	ns
Body dissatisfaction	13.4 (8.8)	13.4 (8.1)	0.06	ns
Ineffectiveness	4.9 (5.6)	5.7 (5.6)	1.32	ns
Perfectionism	4.0 (4.0)	4.0 (4.0)	-0.06	ns
Interpersonal distrust	4.2 (4.0)	4.0 (3.8)	-0.51	ns
Interoceptive awareness	4.4 (5.2)	5.0 (4.8)	1.13	ns
Maturity fears	5.1 (3.9)	4.9 (3.9)	-0.48	ns
Asceticism	3.9 (3.0)	3.0 (3.2)	0.23	ns
Impulse regulation	4.6 (5.2)	4.7 (5.2)	0.23	ns
Social insecurity	4.8 (4.3)	5.2 (4.4)	0.74	ns
Figure rating scale				
Current body	38.4 (12.9)	40.0 (11.8)	1.21	ns
Ideal body	30.9 (8.2)	31.3 (6.1)	0.48	ns
Body dissatisfaction	7.5 (13.7)	8.7 (11.5)	0.93	ns

* All values represent mean (standard deviation).

- Adolescent nutritional and psychological patterns and risk for the development of eating disorders. *Journal of Youth and Adolescence*, 18, 273-282.
- Moss, R.A., Jennings, G., McFarland, J.H., Carter, P. (1984) Binge eating, vomiting, and weight fear in a female high school population. *Journal of Family Practice*, 18, 313-320.
- Pate, J.E., Pumariega, A.J., Hester, C., Garner, D.M. (1991) Cross-cultural patterns in eating disorders: a review. *Journal of the American Academy of Child and Adolescent Psychiatry*, 31, 802-809.
- Riordan, C. (1990) *Girls and boys in school: together or separate?* Teachers College Press. New York.
- Rosen, J.C., Silberg, N.T., Gross, J. (1988) Eating Attitudes Test and Eating Disorders Inventory: norms for adolescent girls and boys. *Journal of Consulting and Clinical Psychology*, 56, 305-308.
- Russell, D., Wilson, N. (1991) *Life in New Zealand commission report*. Wellington: Hillary Commission for Recreation and Sport.
- Schneider, F.W., Coutts, L.M. (1982) The high school environment: A comparison of coeducational and single-sex schools. *Journal of Educational Psychology*, 7, 898-906.
- Shore, R.A., Porter, J.E. (1990) Normative and reliability data for 11 to 18 year olds on the Eating Disorder Inventory. *International Journal of Eating Disorders*, , 201-207.
- Sorensen, T., Stunkard, A.J., Teasdale, T.W., Higgins, M.W. (1983) The accuracy of reports of weight: children's recall of their parents' weights 15 years earlier. *International Journal of Obesity*, 7, 115-122.
- Statistical Analysis System, Inc. (1989) *JMP*. Cary, NC.
- Stunkard, A.J., Sorensen, T., Schulsinger, F. (1983) Use of the Danish adoption register for the study of obesity and thinness. In: Kety, S.S., Rowland, L.P., Sidman, R.L., Matthyse, S.W., Eds. *Genetics of Neurological and Psychiatric Disorders*. New York: Raven Press.
- Wadden, T.A., Brown, G., Foster, G.D., Linowitz, J.R. (1991) Salience of weight-related worries in adolescent males and females. *International Journal of Eating Disorders*, 10, 404-414.
- Wardle, J., Marsland, L. (1990) Adolescent concerns about weight and eating; a social-developmental perspective. *Journal of Psychosomatic Research*, 34, 377-391.
- Wells, J.E., Bushnell, J.A., Hornblow, A.R., Joyce, P.R., Oakley-Browne, M.A. (1989) Christchurch psychiatric epidemiology study, part 1: methodology and lifetime prevalence for specific psychiatric disorders. Australia and New Zealand *Journal of Psychiatry*, 23, 315-326.
- Wells, J.E., Coope, P.A., Gabb, D.C., Pears, R.K. (1985) The factor structure of the Eating Attitudes Test with adolescent schoolgirls. *Psychological Medicine*, 15, 141-146.
- Worsley, A., Worsley, A.J., McConnon, S., Silva, P. (1990) The weight control practices of 15 year old New Zealanders. *Journal of Paediatric Child Health*, 26,

Acknowledgments:

The authors thank Dr Mark Byrd, University of Canterbury, for his contribution to this paper.

Address for correspondence:

Jennifer Fear,
Eating Disorders Service,
The Princess Margaret Hospital,
Private Bag 4727,
Christchurch.