

SUSCEPTIBILITY OF SINGAPORE CHINESE SCHOOLGIRLS TO ANOREXIA NERVOSA – PART I (PSYCHOLOGICAL FACTORS)

L P Kok, C S Tian

ABSTRACT

Of 656 GCE "O" level Chinese Singapore schoolgirls, it was found that 56% perceived themselves as being too fat, and 38% had been teased about being overweight. On the Eating Disorders Inventory (EDI), 15 (2%) had a score at the anorectic range. Compared to a group of American undergraduates, Singaporean subjects had no significant difference on the drive for thinness scores, but had significantly higher scores on bulimia, ineffectiveness, body dissatisfaction, interpersonal distrust and greater maturity fears.

In a population which appears to be susceptible to anorexia nervosa, possible reasons for the low incidence of this disorder is discussed.

Keywords: drive for thinness, bulimic, ineffectiveness, body satisfaction.

SINGAPORE MED J 1994; Vol 35: 481-485

INTRODUCTION

Concern for weight has been described as a recent Western phenomenon, associated with a trend to link thinness with a number of desirable traits like self discipline, control over one's eating habits, elegance, attractiveness, sexual liberation, and a higher socio economic status^(1,2). The preoccupation with weight and dissatisfaction with body weight is especially high in adolescents and young adults⁽³⁻⁷⁾ and even occur in children⁽⁸⁾.

It has been postulated that eating disorders and a preoccupation with weight is a culture bound syndrome, not common in non Western societies. In the seventies virtually no cases of anorexia nervosa were found in non white countries, although since the eighties, as noted by Bryant-Waugh et al⁽⁹⁾, some cases have been reported among the blacks in the US⁽¹⁰⁻¹²⁾, Britain⁽¹³⁾ and Africa^(14,15), in Japanese⁽¹⁶⁾, Singaporeans⁽¹⁷⁾, Malaysians⁽¹⁸⁾, Vietnamese refugees⁽¹⁹⁾, and Arab students⁽²⁾. Among the Chinese, it was pointed out that the reason for this low incidence is because "the Chinese associated fatness with prosperity and longevity and their gods were always portrayed as fat"⁽¹⁸⁾. This, while true for traditional Chinese in the older age groups regarding babies and young children (fat being associated with health and vigour), is certainly not so for adolescent girls and young adults. The classical concept of beauty in a Chinese girl is that of someone willowy and somewhat fragile, with an oval face, almond shaped eyes, and jet black hair, as exemplified by the heroine Lin-Daiyu in "Dream of the Red Chamber"⁽²⁰⁾. The modern concept is

still that of a slim girl, with delicate features, as evident in film stars and singers⁽¹⁷⁾. Thus slimness is a common factor in Chinese and Western concepts of beauty and ideal body shape. If so, would not the attitudes towards weight and dieting be similar in schoolgirls of Chinese ethnic origin and their Western counterparts?

The aim of this study is to assess the susceptibility of a representative sample of Singapore schoolgirls to anorexia nervosa. Singapore is a rather Westernised society, where English and the mother tongue are taught in school. Because it is a multiracial society (comprising Chinese 75%, Malays 15%, Indians 8% and others 2%), English is used as the common language of the 3 main races. It is open to many Western influences and adolescents are conversant with the latest Western popular culture.

METHODOLOGY

All GCE 'O' level year Singapore Chinese schoolgirls (mean age 16.4 years) from four girls' schools in the postal district where the hospital (that the authors were working in) was located, were chosen to participate in the survey. Rating scales were distributed to the principals and discussed with them. Subjects were given information about the study and asked to answer the questionnaires with the understanding that their replies were anonymous, to ensure more accurate response, as some questions pertaining to self and family might not be answered otherwise. The following questionnaires were used:

- 1) A questionnaire including questions on height, weight, past history of being overweight, being teased for this, past treatment for weight problems.
- 2) Eating Disorders Inventory⁽²¹⁾. The Eating Disorders Inventory is a 63-item questionnaire on a 5-point scale which comprises subscales that measure the drive for thinness, bulimia scores, body dissatisfaction, ineffectiveness, perfectionism, interpersonal distrust, interoceptive awareness and maturity fears. These are psychological and behavioural traits that have been found to be important in anorectic patients.
- 3) Family Adaptability and Cohesion Evaluation scale. This is an instrument developed by Olson et al (1982)⁽²²⁾ used to measure family cohesion (or emotional bonding

Department of Psychological Medicine
National University Hospital
5 Lower Kent Ridge Road
Singapore 0511

L P Kok, MBBS, MD, DPM, FRCPsych, FRANZCP
Associate Professor

C S Tian, MBBS, M Med (Psychiatry)
Registrar

Correspondence to: Dr L P Kok
6 Napier Road #10-08
Gleneagles Medical Centre
Singapore 1025

of family members to one another) and family adaptability (the flexibility of a family system to change in response to stresses).

- 4) Parental Bonding Instrument (Parker et al 1979)⁽²³⁾. The Parental Bonding Instrument was developed by Parker to measure the bond between child and parent, in particular the parental components of this bond, which were found to comprise:
 - a) care, a bipolar factor along a dimension of care, involvement, emotional warmth and support, empathy, closeness versus indifference, rejection and neglect.
 - b) overprotection: this included control, infantilisation and intrusion versus permitting and encouragement of autonomy and independence.

Only data from the first 2 questionnaires will be presented in this paper.

RESULTS

There were 656 schoolgirls with a mean age of 16.5 years. After explanation by the teachers, none refused to participate in this study and the response rate was 100%, but the forms were incomplete in 2.

Height and weight

There was no significant difference between the mean height, weight and mean and median body mass index of the group and all Secondary 4 female students in Singapore. The mean height was 160.6 cm compared to a mean of 158 cm for all Secondary 4 female students in Singapore⁽²⁴⁾ and the mean weight was 48.4 kg compared to a mean of 49.2 kg for all Singapore Secondary 4 schoolgirls. The mean and median body mass index (BMI) were 18.89 and 18.72 respectively for the subjects as compared to 19.58 and 19.4 for all Secondary 4 schoolgirls of Singapore. The mean ideal weight that subjects would prefer to have was 2.1 kg less than the mean weight.

Perception of not being the right weight

Three hundred and sixty-nine (56%) of the subjects felt they were too fat, 130 (20%) thought they were too thin and 157 (24%) perceived themselves as being of just the right weight. Compared to a celebrity figure like Princess Diana (who was known to all of them, and whose photographs all had seen), 48 (7%) preferred to be fatter, 432 (66%) would like to be similar to her in size while 174 (27%) wished to be thinner.

Teasing about being overweight and action taken

Two hundred and forty-nine (38%) had been teased about being overweight and of these, 115 (46%) had felt moderately to very embarrassed, while 80 (32%) were only slightly embarrassed, and 54 (22%) did not mind. Of those who had been teased, 77 (31%) had not resorted to any dieting, 110 (44%) had dieted slightly (cut down one fattening item that was usually eaten eg ice cream); 51 (20%) had dieted moderately (cut down two fattening items usually eaten or reduced food intake by less than half); and 11 (4%) had dieted strictly (cut down three or more fattening items

or reduced food intake by half or more).

Treatment for a weight problem

Eighteen (2.7%) had been treated previously for a weight problem, 6 (0.9%) being obese, and 12 (1.8%) underweight. Of these 18 subjects, 2 (11%) had been hospitalised for being underweight, while 16 (89%) had been treated as outpatients. Only one said she had not recovered at the time of the survey.

Menstruation

Forty-one (6.3%) were not having monthly periods and of these, 3 (7%) had previously been menstruating.

Wish to be a model/dancer/aerobics teacher

Two hundred and sixty-four (40%) expressed a wish to be either a model, dancer or aerobics teacher.

Scores on Eating Disorders Inventory

Table I – Comparison on EDI scores between Singapore subjects and American female undergraduates

	Singapore subjects (n=656)		American undergraduates ⁽²⁵⁾ (n=64)		Signif.
	Mean	SD	Mean	SD	
Drive for thinness	3.6	4.5	3.82	5.4	NS
Bulimia	1.3	2.4	0.85	1.75	*
Body dissatisfaction	11.0	7.6	5.85	6.33	**
Ineffectiveness	3.8	4.0	1.02	2.14	*
Perfectionism	6.1	4.4	6.64	3.35	*
Interpersonal distrust	4.3	3.6	2.19	2.24	**
Interceptive awareness	3.6	4.3	1.61	2.41	**
Maturity fears	7.4	4.5	1.39	1.66	**

* < .05

** < .005

The subjects were compared with American undergraduates⁽²⁵⁾ on the scores of the EDI. There was no significant difference between the Singapore and American subjects on the drive for thinness, but Singapore subjects had significantly higher scores on bulimia, were more ineffective, felt greater body dissatisfaction and interpersonal distress and had greater maturity fears. However they were less perfectionistic (Table I).

The subjects were divided into 2 groups on the basis of the drive for thinness scores. Group 1 (641 subjects) comprised the low scoring group (less than 15) and Group 2 (15 subjects) comprised the high scoring group (15 and above). Garner et al (1983)⁽²¹⁾ found a cut-off point of 15 in anorexia nervosa subjects.

The 2 groups were compared on the scores for the EDI. Group 2 had very significantly higher scores on the drive for thinness ($p < .001$), body dissatisfaction ($p < .001$), and significantly higher scores on perfectionism ($p < .01$) and bulimia ($p < .05$) (Table II).

Table II – Comparison of subjects with high and low drive for thinness on the Eating Disorders Inventory

		n	Mean	SD	T value	Signif.
Drive for thinness	Gp 1	641	3.22	3.98	-30	***
	Gp 2	15	17.80	1.78		
Bulimia	Gp 1	641	1.21	2.35	-2.08	0.05
	Gp 2	15	3.60	4.42		
Body dissatisfaction	Gp 1	641	10.82	7.46	-5.53	***
	Gp 2	15	19.73	6.13		
Ineffectiveness	Gp 1	641	3.73	4.34	-1.46	NS
	Gp 2	15	5.46	3.84		
Perfectionism	Gp 1	641	6.07	4.34	-3.7	*
	Gp 2	15	9.80	3.84		
Interpersonal distrust	Gp 1	641	4.34	3.64	0.49	NS
	Gp 2	15	4.00	2.67		
Interoceptive awareness	Gp 1	641	3.53	4.23	-1.6	NS
	Gp 2	15	5.85	5.61		
Maturity fears	Gp 1	641	7.37	4.52	-0.85	NS
	Gp 2	15	8.60	5.52		

Group 1 : Subjects below 15 on the Drive for Thinness Scale.
Group 2 : Subjects above 15 on the Drive for Thinness Scale.

* < .01 *** < .0001
** < .001 NS : not significant

When the 2 groups were compared on the body mass index (BMI), significantly more of those in the high drive for thinness group had a higher BMI than those with a low drive for thinness (DT) (Table III). It can be seen that in the BMI range of 15 to 19.9, there were 58% of Group 1 subjects compared to 30% of Group 2 subjects ie the majority of the schoolgirls with low DT had a low BMI (below that of 19). The BMI of normal men and women should be in the range 19 to 27 kg/m^(25,26) and a well trained marathon runner has a BMI of 20⁽²⁷⁾.

Table III – Body Mass Index (BMI) by drive for thinness scores

BMI	Drive for Thinness	
	Low	High
15 – 18.9	372 (58.1%)	5 (33.0%)
19 – 27.9	263 (40.9%)	10 (67.0%)
28 +	6 (1.0%)	–
Total	641	15

p < .0001

An additional comparison was made of the high DT group with an anorexia nervosa group⁽²¹⁾ (Table IV) and no significant differences were found in the drive for thinness, bulimia and perfectionism scores but the anorexia nervosa group had significantly lower body dissatisfaction, interpersonal distrust and interoceptive awareness scores while the Singapore group with high DT had significantly greater maturity fears.

Table IV – Comparison of subjects with high drive for thinness scores and American anorexia nervosa girls

		n	Mean	SD	T value	Signif.
Drive for thinness	Gp 1	15	16.5	1.91	1.277	NS
	Gp 2	129	15.2	5.3		
Bulimia	Gp 1	15	3.25	4.06	1.309	NS
	Gp 2	129	2.2	3.8		
Body dissatisfaction	Gp 1	15	19.50	5.99	3.951	<.001
	Gp 2	129	13.8	7.1		
Ineffectiveness	Gp 1	15	6.28	5.66	-4.781	<.001
	Gp 2	129	13.9	8.0		
Perfectionism	Gp 1	15	9.60	4.21	-0.290	NS
	Gp 2	129	9.9	5.1		
Interpersonal distrust	Gp 1	15	4.21	3.03	-3.185	<.01
	Gp 2	129	7.4	5.1		
Interoceptive awareness	Gp 1	15	5.85	4.97	-4.624	<.001
	Gp 2	129	12.3	7.0		
Maturity fears	Gp 1	15	8.07	4.88	1.959	<.05
	Gp 2	129	5.9	5.4		

Group 1 : Singapore subjects with high drive for thinness.
Group 2 : American anorexia nervosa subjects. (Garner et al, 1983)
NS : not significant

DISCUSSION

In this sample of Singapore schoolgirls, 56% felt they were overweight, about 38% were actually teased about their weight problems and 26% had dieted as a result of this. The preoccupation of being too fat is also common in Western adolescents where as many as 70%-80% have such a complaint^(28,29) and also in college students, of whom 50% of the women undergraduates perceived themselves as being overweight⁽³⁰⁾. Dieting as a response to this is common^(6,31) and even in economically and racially diverse schoolchildren, 63% of the girls were on a weight reducing regimen with little difference between whites and hispanics⁽³²⁾. Among preadolescent children, 37% had tried to lose weight⁽⁸⁾.

On the EDI scores, the drive for thinness subscale scores in the Singapore girls were not significantly different from a group of American college girls. High scores were found in Asian schoolgirls⁽³³⁾, University students⁽³⁴⁾, and Japanese female students⁽³⁵⁾ on the Eating Attitude Test scale, a scale to measure eating attitudes developed earlier⁽³⁶⁾. However, King et al (1989)⁽³⁷⁾ cautioned that findings of high scores could have been due to linguistic and cultural differences that had to be taken into consideration; but it was observed that even when such factors had been taken into account, the scores were still high⁽³⁴⁾. In the Singapore subjects, English was the first language studied, while the mother tongue was learned as a second language. Thus there was little possibility of linguistic pitfalls and the findings should be taken as reflecting the actual attitudes.

About 2% of the Singapore schoolgirls were high scorers on the Drive for Thinness Scale (above 15 points). Whether they would later develop anorexia nervosa is left to be seen. It is likely that, as has been suggested⁽²⁸⁾, there is a continuum of eating disorders, ranging from those with dieting behaviour, then a sub-clinical group and finally to those with true eating disorders. Certainly epidemiological studies have

found that sizeable proportions of young girls have been shown to have an anorectic type of attitude. In a study of London schoolgirls⁽⁵⁾, about 8.2% scored above 20, using the Eating Attitudes Test, and in Mumford et al's study (1991)⁽³⁸⁾ 12.3% of Asians and 8.7% of Caucasians did likewise. These proportions are higher than that of the Singapore schoolgirls. In addition, when compared to American undergraduates using the EDI, although the drive for thinness scores were not significantly different, other scores were, viz bulimia, body dissatisfaction, ineffectiveness, perfectionism, interpersonal distrust, interoceptive awareness and maturity fears. Thus, it would appear that several postulated factors important for the development of anorexia nervosa ie disturbance of body image and body concept, disturbance of the identification of stimuli in the body and sense of ineffectiveness, difficulties in interpersonal relationship and separation individuation^(39,40), fears of maturation and sexuality⁽⁴¹⁾, difficulty in identifying emotions⁽⁴²⁾, and perfectionistic tendencies^(43,44) are present to a significant extent in Singapore schoolgirls.

Therefore, if these factors, in addition to concern for weight and dieting behaviour are present among these Singapore schoolgirls, why then is there such a low incidence of anorexia nervosa in general, in adolescents of Chinese ethnic origin compared to Caucasians? In Hong Kong, Lee et al⁽⁴⁵⁾ found less than 10 cases over 5 years in a psychiatric unit serving 500,000 people. In addition they quoted an unpublished epidemiological survey in Hong Kong where one possible case existed in a community of 7,229 subjects. In Singapore, 7 Singapore Chinese girls were treated in the medical wards for anorexia nervosa who had features similar in terms of clinical presentation, class, family factors, to those described in the Caucasian population⁽¹⁷⁾. Kok and Tian⁽⁴⁶⁾ found 12 hospitalised cases of anorexia nervosa in a psychiatric unit of a general hospital serving a population of 250,000 over 4 years.

It is difficult to single out a single factor as causing anorexia nervosa⁽¹²⁾. A stress diathesis model of multiple aetiological factors has been suggested, and Garner and Garfinkel (1980)⁽⁴⁷⁾ proposed that individual predisposing factors including individual, familial and socio cultural ones could lead to abnormal eating patterns when set off by precipitating factors. Piazza et al (1980)⁽⁴⁸⁾ stressed faulty ego development with defects in body awareness and ego boundaries. The exposure to Western lifestyle, leading to 'slimness consciousness' and 'performance expectations' of women to achieve and succeed materially⁽⁴⁵⁾ are present in Singapore. (Female graduates from institutions of higher learning increased from 1,733 in 1978 to 5,260 in 1988)⁽⁴⁹⁾. In addition are maturity fears which have been postulated⁽³⁷⁻⁴⁰⁾ to be one of the factors significant for the development of anorexia nervosa. However balanced against them are protective factors present in Chinese societies like the later onset of puberty, the relatively smaller changes in breast and body size at puberty⁽⁴⁵⁾ and the small physique of Chinese girls (Table III shows that about 58% of the schoolgirls in this study with a low drive for thinness had a BMI of less than 19; compared to this, American data⁽⁵⁰⁾ show that in white and black American females aged 16 years, the following BMI were found:

- 15th percentile – 17.59 (whites); 17.48 (blacks)
- 50th percentile – 20.11 (whites); 20.11 (blacks)
- 95th percentile – 28.95 (whites); 32.51 (blacks)

In addition there is the fairly common occurrence in Chinese societies of interdependent enmeshed families which would make such families more a norm than an exception⁽⁴⁵⁾. In Singapore 17% of a group of schoolgirls had enmeshed families and the majority perceived their families as being rigidly cohesive⁽⁵¹⁾.

Although plumpness is not a desirable state in Singapore girls, perhaps a further possible explanation for the relatively few cases of clinical anorexia nervosa could be that in a population where the majority are thin and obesity is relatively uncommon, any slight departure from the usual thin norm (ie being plump) would be easily obvious. The findings of this study showed that 38% of the girls said they had been teased about being plump and of these, 70% had taken action to reduce their weight. If dieting should start then it would not be difficult to attain the previous weight – Chinese home cooked food emphasises non fattening items like vegetables, seafood and white meat; steaming is a popular method of cooking and desserts are rarely eaten. Therefore if weight loss is not difficult to achieve, and if there are seldom any examples of gross obesity, the extreme fear of loss of control (that could result in great distortion of body weight) may not be present. Failure to seek medical treatment is unlikely to be the reason for the small number of clinical cases of anorexia nervosa as school children are screened regularly by the School Health Services (the number of medical checkups of female students increased from 113,900 in 1978 to 296,500 in 1988⁽⁴⁹⁾ and the current small size of Singapore families (the net reproduction rate in 1987 was 769 per thousand female population)⁽⁴⁹⁾ makes parents pay attention to the well being of their children. Also there is no lack of medical care in Singapore – in 1988 there was one doctor per 837 persons and one hospital bed per 270 persons⁽⁴⁹⁾. Therefore it could be said that in a society where obesity is not a major issue, where extreme samples of obesity are rare, and control of weight is helped by the non fattening type of home-cooked food commonly eaten, the intense fear of being fat would be absent; thus instead of being driven into the overdieting behaviour of anorectics, the dieting would be mild, and would aim at a desired weight which would not be exaggerated or abnormal.

However it has to be borne in mind that Westernisation is associated with higher rates of anorexia nervosa⁽¹³⁾. Mumford et al⁽³⁸⁾ in their study of 559 girls found anorexia nervosa to be not uncommon among Asian schoolgirls in the United Kingdom, and suggested that Asian girls were probably adopting Western reactions to stress and conflicts. This Westernisation process is also happening in Singapore. A comparison of a group of Singapore Chinese university students and their mothers, showed that students' scores on a Chinese Culture Scale (a measure of Chinese beliefs and practices) were significantly lower than their mothers⁽⁵²⁾. Thus as Singapore becomes more Westernised and as the young consume more high fat, low fibre Western fast food, eating disorders are likely to become more prevalent. As this study has shown attitudes to weight are not dissimilar to those found in Western studies and obesity is becoming more common – in 1980, 556 per 10,000 female Secondary 4 schoolgirls were obese compared to 1,158 per 10,000 Secondary 4 schoolgirls in 1988⁽⁴⁹⁾. Thus, in future, the rates of anorexia nervosa may increase.

ACKNOWLEDGEMENT

We would like to thank the School Health Services of the

Ministry of Health for providing height/weight data on Secondary 4 schoolgirls and Dr Frances Lee and Dr Pauline Chan, formerly of The Institute of Education, for their advice.

REFERENCES

- Dally PJ, Gomez P. Anorexia nervosa. London: William Heinemann. 1979.
- Nasser M. Culture and weight consciousness. *J Psychosom Res* 1988; 32:573-7.
- Mann AH, Wakeling A, Wood K, Monck E, Dobbs RA, Szumckler G. Screening for abnormal eating attitudes and psychiatric morbidity in an unselected population of 15-year-old schoolgirls. *Psychol Med* 1983; 13:573-80.
- Schotte DE, Stunkard AJ. Bulimia vs bulimic behaviours on a college campus. *JAMA* 1987; 258:1213-5.
- Johnson-Sabine E, Wood K, Patton G, Mann A, Walkeling A. Abnormal eating attitudes in London schoolgirls - a prospective epidemiological study: factors associated with abnormal response on screening questionnaires. *Psychol Med* 1988; 18:615-22.
- Moore DC. Body image and eating behaviour in adolescent girls. *Am J Dis Child* 1988; 142:1114-8.
- Patton GC. The spectrum of eating disorder in adolescence. *J Psychosom Res* 1988; 32:579-84.
- Maloney JM, McGuire J, Daniels SR, Specker B. Dieting behaviour and eating attitudes in children. *Paediatrics* 1989; 84:482-9.
- Bryant-Waugh R, Lask N. Anorexia nervosa in a group of Asian children living in Britain. *Br J Psychiatry* 1991; 158:229-33.
- Pumariega AJ, Edwards P, Mitchell CB. Anorexia nervosa in black adolescents. *J Am Acad Child Psychiatry* 1984; 23:111-4.
- Selber T. Anorexia nervosa in black adolescents. *J Natl Med Assoc* 1984; 76:29-32.
- Hsu LKG. The aetiology of anorexia nervosa. *Psychol Med* 1983; 13:23-8.
- Holden N, Robinson P. Anorexia nervosa and bulimia nervosa in British blacks. *Br J Psychiatry* 1988; 152:544-9.
- Nwaefuna A. Anorexia nervosa in a developing country. *Br J Psychiatry* 1981; 138:270-1.
- Buchan T, Gregory L. Anorexia nervosa in a black Zimbabwean. *Br J Psychiatry* 1984; 145:326-30.
- Suematsu H. ed. The concept and definition of anorexia nervosa. In: *Anorexia nervosa*. Tokyo: Igakushoin, 1985:2-11.
- Ong YL, Tsoi WF, Cheah JS. A clinical and psychosocial study of 7 cases of anorexia nervosa in Singapore. *Singapore Med J* 1982; 23:255-61.
- Buhrich N. Frequency of presentation of anorexia nervosa in Malaysia. *Aust N Z J Psychiatry* 1981; 15:153-5.
- Kope T, Sack W. Anorexia nervosa in Southeast Asian refugees: a report of 6 cases. *J Am Acad Child Adolesc Psychiatry* 1978; 26:795-7.
- Cao XC. *Dream of the Red Chamber* (based on 1792 version). Taiwan: Jiang Men Wen Wu Publishing Co. 1986.
- Garner DM, Olmstead MP, Polivy J. The Eating Disorder Inventory: A measure of cognitive behavioural dimensions of anorexia nervosa and bulimia. In: Darby PL, Garfinkel PE, Garner DM, Cosana DV. eds. *Anorexia Nervosa, recent developments in Research*. New York: Alan R Liss 1983:173-84.
- Olson DH, McCubbin HI, Barnes HL, Larsen AS, Muxen MJ, Wilson MA. *Families: What makes them work*. Beverly Hills, USA: Sage Publication 1983.
- Parker G, Tupling H, Brown LB. A parental bonding instrument. *Br J Med Psychol* 1979; 52:1-10.
- Ministry of Health, School Health Services 1990. (Data provided).
- Davis C, Cowles M. A comparison of weight and diet concerns and personality factors among female athletes and non-athletes. *J Psychosom Res* 1989; 33:527-36.
- Forbes GB. Body composition: influence of nutrition, disease, growth and ageing. In: Shils ME, Young VR. eds. *Modern nutrition in health and disease*. Philadelphia: Lea & Febiger. 1988:533-56.
- Nestle M. eds. *Nutrition in clinical practice*. In: Jones Medical Publication. Tokyo: Moruzen Co Ltd. 1986:222-31.
- Nylander J. The feeling of being fat and dieting in a school population. *Epidemiologic interview investigation*. *Acta Sociomedica Scand* 1971; 1:17-26.
- Eisele J, Hertsogaard D, Light HK. Factors related to eating disorders in young adolescent girls. *Adolescence* 1986; 21(82):283-90.
- Zuckerman DM, Colby A, Wone NC, Lazerson JS. The prevalence of bulimia among college students. *Public Health Briefs* 1986; 76:1135-7.
- Crowther JH, Post G, Zaylor L. The prevalence of bulimia and binge eating in adolescent girls. *Int J Eating Dis* 1985; 4:29-42.
- Rosen JC, Guss J. Prevalence of weight reducing and weight gaining in adolescent girls and boys. *Health Psychol* 1987; 6:131-47.
- Mumford DB, Whitehouse AM. Increased prevalence of bulimia nervosa among Asian schoolgirls. *Br Med J* 1988; 297:718-9.
- Mumford DB, Whitehouse AM. Bulimia nervosa among Asian schoolgirls. *Br Med J* 1988; 297:1404.
- Nogami Y, Yamaguchi T, Ishiwata H, Sakai T, Kusakabe Y. The prevalence of binge eating in the Japanese university and high school student population. Paper presented at International Conference on Anorexia Nervosa and Related Disorders. Sinausa, UK. 1984.
- Garner DM, Garfinkel PE. The Eating Attitudes Test: an index of the symptoms of anorexia nervosa. *Psychol Med* 1979; 9:273-9.
- King HB, Bhugra D. Eating disorders: lessons from a cross cultural study. *Psychol Med* 1989; 19:955-8.
- Mumford DB, Whitehouse AM, Platts M. Sociocultural correlates of eating disorders among Asian schoolgirls in Bradford. *Br J Psychiatry* 1991; 158:222-8.
- Bruch H. *Eating disorders, obesity, anorexia nervosa and the person within*. New York: Basic books. 1973.
- Bruch H. *Psychotherapy in eating disorders*. *Can J Psychiatry* 1977; 22:102-8.
- Crisp AH. *Anorexia: Let me be*. New York, London: Academic Press, Grune Stratton. 1980.
- Nemiah J. The psychosomatic nature of anorexia nervosa. *Adv Psychosom Med* 1972; 7:316-21.
- Slade P. Towards a functional analysis of anorexia nervosa and bulimia nervosa. *Br J Clin Psychol* 1982; 21:167-79.
- Garner DM, Bemis KM. A cognitive behavioural approach to anorexia nervosa. *Cognitive Ther Res* 1982; 6:123-50.
- Lee S, Chiu HFK, Chen C. Anorexia nervosa in Hong Kong. Why not more in Chinese? *Br J Psychiatry* 1989; 154:683-8.
- Kok LP, Tian CS. Unpublished data 1991.
- Garner DM, Garfinkel PE. Social cultural factors in the development of anorexia nervosa. *Psychol Med* 1980; 10:647-56.
- Piazza E, Piazza N, Rollins N. Anorexia nervosa - controversial aspects of therapy. *Compr Psychiat* 1980; 21:177-89.
- Department of Statistics. *Yearbook of Statistics, 1988*. Singapore: Department of Statistics, 1988.
- Must A, Dailal GE, Dietz WH. Reference data for obesity: 85th and 95th percentiles of body mass index (wt/h²) - a correction. *Am J Clin Nutr* 1991; 54:773.
- Kok LP, Tian CS. Family relationship and eating attitudes in Singapore schoolgirls. Paper presented at the 3rd ASEAN Congress on Psychiatry and Mental Health. 24-27 January 1991, Kuala Lumpur, Malaysia. 1991.
- Tsoi WF, Kok LP. Culture, strain and mental health in the Singapore Chinese family: Intergenerational comparison. *Proceedings of Asian Family Mental Health Conference*. Tokyo: Psychiatric Research Institute. 1986:141-8.