Malaysian Journal of Medicine and Health Sciences Vol. 4(1) January 2008: 69–78

Eating Perception and Psychiatric Morbidity in Secondary School and Medical Students in Kelantan

***KO Noorjan Naing, *MZ Azhar, **NN Naing, ***N Kumaraswamy & *JO Zubaidah**

** Department of Psychiatry, Universiti Putra Malaysia, Grand Season Avenue, Jalan Pahang, 53000, Kuala Lumpur*

*** Unit Epidemiology and Statistics, Universiti Sains Malaysia, Kubang Kerian, 16150, Kota Bharu*

**** Department of Community Based Medicine, Universiti Sabah Malaysia, Kota Kinabalu 88999, Sabah*

ABSTRACT

Introduction: A significant concern about body weight and shape is the pathognomonic feature of eating disorders. According to the cognitive view, ideation and belief component is the primary cause for the development and maintenance of eating disorders. Higher psychiatric morbidity and psychological stress increases the development of eating disorders. **Objective**: This study was conducted to examine whether there is a relationship between psychological stress and cognitive aspect of eating, and between secondary and tertiary students. **Methods**: A cross-sectional study was carried out to determine beliefs about weight and shape concerns among secondary and tertiary level students. A total of 1253 students consisting of 13-18 years old secondary school students and 19-24 years old medical students were involved in this study. The students completed a questionnaire assessing psychopathology on beliefs and attitudes towards weight and shape and General Health Questionnaire (GHQ-30). **Results**: The results indicate a high prevalence of psychiatric morbidity among university students compared to secondary students. Year 1 medical students appear to have a higher frequency of psychiatric morbidity (53.9%) than year 4 medical students (28.4%). Eating beliefs relating to weight and shape were significantly higher in secondary school students than medical students. The results of multiple linear regression on the eating belief questionnaire were a significant predictor of psychiatric morbidity. Higher GHQ scores were negatively related to eating belief question 28 of bulimic component. **Conclusion**: It would be useful to conduct future studies to explore the possible causal factors for weight and shape concerns among secondary school students and higher psychiatric morbidity among medical students in Kelantan.

Keywords: Psychiatric morbidity, eating beliefs, weight and shape concerns, secondary and university students

INTRODUCTION

Cognitive biases and cognitive distortions have been implicated as important factors in the development and maintenance of eating disorders.[1,2,3] Cooper had reported the development of new measure, the Eating Disorder Belief Questionnaire (EDBQ), which was designed specifically to assess core negative self-beliefs and underlying assumptions related to

Coresponding author: *onkhin@medic.upm.edu.my*

eating disorders.[2] The EDBQ has been used in three clinical studies, including healthy controls, normal dieters and depressed, non-eating disorder patients. These studies highlight that underlying assumptions and core beliefs are central to the development of eating disorders. The questionnaires measured the assumptions about weight and shape as well as about eating.[4,5, 6]

Psychiatric morbidity is associated with the development of eating disorders. Those with the highest psychiatric morbidity have a six-fold risk increase in developing eating disorders.[7,8] Dahlin *et al.* state that the magnitude of burnout and psychiatric morbidity among medical students entering clinical training, due to depression, anxiety or eating disorders could not be determined with certainty. [9]

Most studies that use a questionnaire consisting of assumptions about weight and shape [10,11] do not really assess cognitive aspects and perceptions of eating, body weight and shape. Furthermore, only a few studies have attempted to establish the relationship between eating beliefs and psychiatric morbidity. In view of this, we conducted a study of non-clinical cases to determine the beliefs related to weight and shape concerns in 13-18-year old secondary school students and 19-24 year old university students to establish the association between eating beliefs and the General Health Questionnaire (GHQ).

METHODS

Subjects

Subjects comprised students from 3 secondary schools, Sekolah Menengah Zainab (1) (SMZ- 1), Sekolah Menengah Mahmud Mahyudin (SMMM), and Sekolah Menengah Kedai Buluh (SMKB) and students of Universiti Sains Malaysia (USM). In total, 1260 students were identified from three secondary schools and the university. Of the students, 84.8% (1068) were female and 15.2% (192) were male. Cluster sampling method was used for the collection of sample.

The students who agreed to participate were required to give verbal consent. Form 1 and Form 5 students, from all classes of selected schools in the academic year of 1999 and all year 1 and year 4 university students in the academic year of 2000-2001 were involved in this study. Respondents who could not understand or communicate in Bahasa Melayu were excluded from the study.

Measurements

The Eating Disorder Beliefs Questionnaire (EDBQ) is a self-report questionnaire. Three studies[3] describe the development of a self-report questionnaire to assess assumptions and beliefs relevant to eating disorders. The questions were a subscale of four factors: (i) negative self-beliefs, (ii) weight and shape as a means of acceptance by others (iii) weight and shape as a means of self-acceptance, and (iv) control over eating. The four factors consisted of 32 questions measuring the extent of psychopathology of concerns about weight and shape.

The questions referred to the subject's beliefs most of the time rather than what they feel at the time of assessment. Belief in each item was related to a visual analogue (0-100)

scale. End points were anchored at "I do not usually believe this at all (0%) and "I am usually completely convinced that this is true"(100%). In this study, the Malay version of the EDBQ was used. The Bahasa Malaysia version has been shown to have good construct validity and reliability.[12]

For the screening of psychiatric morbidity, the Malaysia version of GHQ-30 was used in this study. In Malaysia, both the English[13] and Bahasa Malaysia versions[14] of this instrument have been validated in the local population. For each item, the participant is asked whether the particular symptoms or behaviour occurred during the previous week. This GHQ version has a symptom sub-scale for somatic symptoms, anxiety and insomnia, depression and social dysfunction. Each question has 4 responses ranging from minimum (0) to maximum (1). Total responses likely from each participant would amount to a range of 0-30. For this study in particular, subjects scoring equal or above 7 were regarded as potential cases and those scoring above 15 were considered as psychologically distressed cases.

Demographic Data

Demographic data of name, age, sex and ethnic groups of participants were collected. Body Mass Index (BMI) was recorded based on self-report and subjective measurement.

Procedures

Consent from the local school authorities and the class teachers were obtained. Every student had to give a written consent to participate in the study. The scheduled time for data collection was established in co-operation with schoolteachers. The data collection took 30 minutes, taking up two-thirds of one regular school session. In order to prevent students from influencing each other's responses, all eligible students at each school finished at the same time. All students who agreed to participate in this study were gathered in the school assembly hall.

The aims of the study and administration of the questionnaire were explained prior to the students answering the questionnaire. Each student was required to answer independently and undisturbed by their peers. Students who did not understand the meaning of the questionnaire were allowed to ask investigators individually. Approximately 15-20 minutes were allotted for completion of the questionnaire. In the case of university students, undergraduates were recruited with the permission of lecturers. The procedure was carried out in the same manner as above.

Statistical Analysis

For univariate analysis, the chi-square test was used to analyse categorical outcome variables. To identify the difference in mean values among several groups, one-way analysis was applied for normally distributed outcomes. If the outcome was non-normally distributed, the Kruskal-Wallis test followed by Mann-Whitney test was used to find the differences. All tests were at the $p \leq 0.05$ level of significance. Multiple linear regression was applied to establish the association between EDBQ and GHQ.

RESULTS

Of the total sample of 1260, 1253 were collected and seven samples had to be excluded in view of incompleteness. Of the total, 1062 (84.8%) students were female and 191 (15.2%) were male. The number of students from the university was 458 while 318, 260 and 217 were from SMZ-1, SMKB, SMMM and USM respectively. Among the three secondary schools and the university, SMZ accounted for almost 37% of the study population with the highest number of participants. The majority (45.7%) was Form 1 students and included both males and females. Form 5 students constituted 37% of the study population followed by year 1 USM students (11.4%). USM students accounted for only 5.9% of the total study population. Secondary students represented 82.8% (1036) of the sample and tertiary students accounted for only 17.3% (217) (Table 1).

The sample mainly consisted of subjects from the Malay ethnic group with other ethnic groups contributing only 3% to the sample. Thus, the sample was inadequate to make comparisons between ethnic groups.

Eating Disorders Beliefs Questionnaire Results

The Kruskal-Wallis test identified significant differences between secondary and university students for the four subscales. Factor 1, negative self-beliefs (NSB) ($p< 0.001$), Factor 2, weight and shape as a means of acceptance by others (AO) ($p<. 001$), Factor 3, weight and shape as a means of self-acceptance (SA) ($p<. 023$) and Factor 4, control over eating (COB) ($p<0.001$). It was followed by the Mann-Whitney test which indicated that secondary students scored significantly higher than university students in all four scales of the eating beliefs questionnaire (Table 2). The mean rank scores of secondary school students were significantly higher in all four subscales. The measures of assumptions about weight and shape and eating were significantly higher in secondary school students than in university students.

Among secondary school students, Form 5 students, compared to Form I students, scored significantly higher on three subscales of the eating disorder belief questionnaire: Factor 2, weight and shape as a means of acceptance by others ($p<0. 004$), Factor 3, weight and shape as a means of self-acceptance ($p<0. 001$) and Factor 4, control over eating ($p=0.022$), (Table 3). Beliefs relating to weight and shape acceptance were found to be significantly higher in older adolescents.

Among university students, year 1 students were significantly higher in all beliefs scores. Apart from 'P' value 0.022 in negative self-beliefs, weight and shape acceptance and control over eating beliefs were significantly higher in year 1 students than in year 4 students ($p<0.001$)(Table 4).

GHQ Results

Looking at the GHQ results, more than half of the secondary school students scored less than or equal to 7. The respective figures for high risk (>7) was considerably low (27.8%) in Form 1 and (30.6%) in Form 5. Only 6.3% of Form 1 students and 4.7% of Form 5 students reached the level of severe psychological distress as they scored above 15. The results revealed that about 34.4 % of secondary school students were at high psychiatric morbidity.

Table 1. Distribution of study participants by schools

School	Frequency	Percent
SMZ	458	36.6 %
SMKB	318	25.4 %
SMMM	260	20.8 %
USM	217	17.3 %

Table 2. Mean score differences among secondary and university students on the Eating Disorders Belief Questionnaire

Eating Disorders Belief Questionnaire	Level of students	Mean rank	*z*-value	*p*-value
Negative self beliefs	Secondary University	657.86 476.32	-6.707	<0. 001*
Weight and shape as a means of acceptance by others	Secondary University	665.23 433.68	-8.602	<0. 001*
Weight and shape as a means of self-acceptance	Secondary University	635.62 574.51	-2.269	<0 .023*
Control over eating	Secondary University	656.66 466.36	-7.040	<0. 001*

*p < 0.05

In terms of proportion of students expected to have psychological distress, there was no significant difference between Form 1 and Form 5 secondary students (Table 5). Whereas among university students, year 4 medical students reported less psychological distress with about 71.6% scoring equal to or less than 7 and only 21.6% scoring more than 7. In contrast, 32.2% of year 1 medical students had significant higher GHQ scores of >7. Furthermore, 21.7% of year 1 medical students scored above 15 and had significantly higher GHQ scores compared to all other groups. Therefore, the results strongly indicate that year 1 medical students are expected to have higher psychological distress compared to other groups.

Multiple linear regression was applied to predict the association between EDBQ and GHQ. For a more accurate prediction, each questionnaire was analysed rather than analysing according to factor domains. Stepwise regression analysis was used to identify the constant predictors. This analysis was done for all levels including secondary and tertiary students. The results showed that five eating belief questions were constantly associated with GHQ.

Table 3. Significant different eating beliefs subscale scores between Form 1 and Form 5 students

Eating Disorders Belief Questionnaire	Level of students	Mean rank	*z*-value	*p*-value
NSB	Form 5	508.82		0.374
	Form 1	525.43		
AO	Form 5	546.05	-2.868	0.004*
	Form 1	492.55		
SA	Form 5	601.41	-8.257	<0.001*
	Form 1	447.41		
COE	Form 5	560.23	-2.299	<0.022*
	Form 1	481.75		

*p < 0.05
NSB = Negative self-belief
AO = Weight and shape as a means of acceptance by others
SA = Weight and shape as a means of self-acceptance
COE = Control over eating

Table 4. Significant different eating beliefs subscale scores between Year 1 and Year 4 students

Eating Disorders Belief Questionnaire	Level of students	Mean rank	*z*-value	*p*-value
NSB	Year 1	116.02	-6.707	0.022
	Year 4	95.44		
AO	Year 1	121.24	8.602	<0.001
	Year 4	85.35		
SA	Year 1	121.43	-2.269	<0.001
	Year 4	84.98		
COE	Year 1	118.28	-7.040	<0.001
	Year 4	86.67		

*p < 0.05

Table 5. Frequency distribution of GHQ scores of university and secondary students

Levels	0 - 7	>7 - 15	Above 15
Form 1	65.9%	27.8%	6.3%
Form 5	64.7%	30.6%	4.7%
Year 1	46.2%	32.2%	21.7%
Year 4	71.6%	21.6%	6.8%

Table 6. Multiple linear regression for the prediction of GHQ based on eating beliefs

Question	B (regression coefficient)	p-value	95% confidence interval of "b"	
Q27	0.0147	0.000*	0.006	0.023
Q10	0.0166	0.002*	0.006	0.027
Q5	0.0153	0.027*	0.002	0.029
Q6	0.0212	0.002*	0.008	0.034
Q28	-0.0119	0.021*	-0.022	-0.002

Prediction is significant at $p < 0.05$

With the exception of question 28, the four questions that were positively correlated to GHQ {Q27 (I'm dull), Q10 (If I stay hungry I can guard against losing control and getting fat), Q5 (I am a failure) and Q6 (If I eat a forbidden food I won't be able to stop)}. The final model indicates that these were the significant predictors for psychiatric morbidity. If a unit of each question increased, GHQ could be increased by 0.0153, 0.0212, 0.0166 and 0.0147 respectively. Question number 28 ("If I binge and vomit I can stay in control") was also significant in predicting GHQ score but was negatively associated with GHQ. If a unit of question 28 was increased, GHQ will be reduced by 0.0119 ($p<0.05$) (Table 6).

DISCUSSION

In this study, the majority of the sample was secondary schoolgirls and the age range was between 13-18 years. University students constituted only 17.2 % of the total study population. As the number of male subjects only constituted 15.2 % (192) of the sample, it was inadequate to make comparisons between males and females.

In this study, the results of GHQ showed a high prevalence of psychiatric morbidity among university students compared to secondary students. Year 1 medical students appear to have a higher frequency of psychiatric morbidity (53.9 %) compared to year 4 medical students (28.4 %). Based on the results of multiple linear regression, the eating belief questionnaire is a significant predictor of psychiatric morbidity. Higher GHQ scores are positively related to higher scores in eating belief questions except for question 28 of bulimic belief component.

Interestingly, the present study did not report higher levels of eating beliefs among university students. Although Year 1 medical students had higher GHQ compared to other levels, eating belief questionnaire scores were lower compared to secondary school students. In this case, possible reasons were the stress of change to young adulthood, changing of life style, examination anxiety and depression and other psychological stressors. Increased scores of GHQ might be due to the above reasons rather than concerns about eating.

Previous studies have determined that university students have a higher prevalence of bulimia than working women. [15,16] The studies speculate that the stress of academia, the first move away from home or social pressure of communal dormitory living increase the

likelihood of adopting a disordered eating pattern, which could lead to bulimia nervosa. In order to identify the risk of developing bulimia in university students, it is better to use more specific bulimic content of eating belief questionnaires than the present questionnaire. The lowered GHQ scores in Year 4 medical students might be due to less academic stress because in Year 4 there is no formal professional examination.

Among secondary school students, the results show that about 34.4% of secondary school students are at high risk of developing psychological distress. Form 5 students had relatively higher (35.3%) GHQ scores than Form 1 students (34.%). In relation to psychological correlates of the eating belief questionnaire, Form 5 students reported the highest level of concerns about eating, body weight and shape followed by Form 1 students. Concerns about weight and shape have not been shown to be obviously positively associated with GHQ. On the other hand, although they had higher scores about weight and shape, the majority of secondary school students (almost 66%) did not score high in GHQ.

Such findings call into question whether secondary school students have more bulimic beliefs as predicted by multiple linear regression that Q 28 of bulimic component (Factor – 3 control over-eating), " If I binge and vomit I can stay in control" was negatively related to GHQ. The content of the question was pleasurable to the subjects. Although they had overeaten, they could make out to be under control by binging and vomiting. That belief gave them less stress and resulted in a lower GHQ.

A previous study [6] states that psychiatric morbidity predicts the onset of eating disorders independently of dieting status such that those subjects in the highest morbidity category have an almost seven-fold increased risk of developing eating disorders. The author did a study on 14-15 year-old adolescents. It was compatible with the results of our study. In this study, there was a significant association between Eating Disorder Belief and General Health Questionnaire. The findings in our study indicate that five belief questions which were designed to assess assumptions and beliefs relevant to eating disorder, are positively associated with psychiatric morbidity.

This is the first study in Malaysia to establish the relationship between eating beliefs and psychiatric morbidity. The findings from this study are undoubtedly limited by the demographic distribution of study participants. All the students participating in this study were predominantly Malay, rendering difficult comparisons with other ethnic groups and generalising the findings to other ethnic groups in a multi-racial country like Malaysia. It was also impossible to compare male and female weight concerns. Comparisons of eating beliefs between male and female medical students and secondary school students would improve the methodology of this study. In addition, it was also difficult to ascertain the association between EDBQ and GHQ in particular age groups because the correlation tests between eating beliefs and psychiatric morbidity were generalised to both university and secondary students.

Assessment of risk factors and co-morbidity was not done in this study. Co-morbid major depression or anxiety contributes to common co-morbid psychiatric disorders.[17,18] An assessment of depression and anxiety by using a standard depression rating scale could have improved the methodology of this study.

In conclusion, this study implies that young adult, first year university students had higher psychiatric morbidity (53.9%) compared to fourth year university students and

secondary school students. Older adolescent girls were more concerned about weight and shape with the possible consequences of developing eating disorders. It would be useful to conduct studies to explore the possible causal factors for the development of weight and shape concerns in Kelantan Secondary School students. Furthermore, it is recommended that EDBQ should be used as part of the clinical assessment together with GHQ to detect the co-morbidity of depression and anxiety.

REFERENCES

[1] Turner H, Cooper MJ. Core beliefs in females with anorexia nervosa. Cognitive Therapy. 2002; 4: 4-5

[2] Cooper MJ, Wells A, Todd G. A cognitive theory of bulimia nervosa. British Journal of Clinical Psychology 2004; 43: 1-16

[3] Turner H, Cooper J. Cognitions and their origins in women with anorexia nervosa, normal dieters and female controls. Clinical Psychology and Psychotherapy 2002; 9: 225-241

[4] Cooper M, Cohen-Tovee E, Todd G. The Eating Disorder Belief Questionnaire; preliminary development. Behavior Research Therapy 1997; 35: 4: 381-388

[5] Rytherford D, Bradford R. The Eating Disorder Belief Questionnaire: in-patient adolescent scores. Clinical Child Psychology and Psychiatry 2001; 6(4): 513-518

[6] O'Connor M, Simmons T, Cooper MJ. Assumptions and beliefs, dieting and predictors of eating disorder related symptoms in young women and young men. Eating Behaviours 2002; 4:1-6

[7] Patton GC *et al.* Onset of adolescent eating disorders: population based cohort study over 3 years. British Medical Journal 1999; 318: 765-8

[8] Rathner G *et al.* Prevalence of Eating disorders and minor psychiatric morbidity in Central Europe before the political changes in 1989, a cross-cultural study. Psychological Medicine 1995; 25: 1027-1035

[9] Dahlin ME, Ruuneson B. Burnout and psychiatric morbidity among medical students entering clinical training: a three-year prospective questionnaire and interview-based study. BMC Medical Education 2007; doi: 10.1186/14722-6920-7-6

[10] Cooper MJ, Fairburn CG. Thoughts about eating, weight and shape in anorexia and bulimia nervosa. Behavior Research and Therapy 1992; 30: 501-511

[11] Cooper PJ, Goodyer, I. Prevalence and significance of weight and shape concerns in girls age 11-16 years. British Journal of Psychiatry 1997; 171: 542-544

[12] Azhar MZ, Norma YIR, Noorjan KON. The Malay Version of Eating Disorder Belief Questionnaire: preliminary development. Malaysian Journal of Psychiatry 2001; 9(2): 21-29

[13] Goldberg D. Manual of the General Health Questionnaire. NEER publishing Company 1978.

[14] Hamid AR, Hatta SM. A validation study of the Malay language translation of General Health Questionnaire (GHQ-30), Malaysian Journal of Psychiatry 1996; 2(4): 118-122

[15] Cooper PJ, Deborah J, Melanie J. The prevalence of bulimia nervosa. A replication study. British Journal of Psychiatry 1987; 151: 684-686

[16] Hart KJ, Ollendick TH. Prevalence of bulimia in working and university women. American Journal of Psychiatry 1985; 142: 851-854

[17] Herzog, David B, Nussbaum M, Marmor K. Co-morbidity and outcome in eating disorders. The Psychiatric Clinics of North America 1996; 19: 843-59

[18] Wonderlich SA, Mitchell JE. Eating disorders and co-morbidity: empirical, conceptual, and clinical implications. Psychopharmacology Bulletin 1997; 33: 381-90