

Gender Differences in Eating Behavior and Social Self Concept among Malaysian University Students

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ABSTRACT

University students may encounter personal, family, social, and financial stresses while trying to cope with their academic challenges. Such constraints could affect their eating behavior and health status which, in turn may have negative effects on their studies. In light of little information in Malaysia on this subject, this study was undertaken on a sample of 180 students pursuing different academic programs in a Malaysian university. The study objectives were to determine the students' eating behavior including body weight control and the extent of fear of being fat, their social self concept that reflects the five selves namely, the psychological self, the social self, the sexual self, the family self and the physical self. Eating behavior and social self concept were determined based on various methods previously validated in studies on young adults in Asia and Australia. This article focuses on gender comparisons for these determinants. The results showed that psychological and emotional factors have a significant bearing on the eating behavior of university students. Uninhibited eating behavior of both the males and females showed significant and negative correlations with feelings pertaining to personal worth, the physical self, and their relationships with peers and families. Gender differences were manifested for some determinants. The females showed more restrained eating behavior than the males; the females have a significantly higher score for family relationship, which appears to be a significant factor on male students' eating behavior. Future studies on a larger sample size may help to unravel the extent to which psychological factors influence eating behavior of students, and the underlying psychosocial basis for some of the gender differences reported in this study.

INTRODUCTION

A multitude of physiological to psychological factors is known to interact and affect eating behaviour that may lead to undesirable consequences. Serious disturbed eating behaviour such as anorexia nervosa and bulimia nervosa are well documented (O'Dea, 1995; Button *et al.*, 1997). As part of the normal developmental process from adolescence to adulthood, various biological, intellectual, psychological and social factors interact and contribute towards the formation of the personal identity (Robbins, 1996). In the quest for personal identity, self concept is formed and it includes feelings of self esteem and one's body image (Brackney, 1979). Negative self concept feelings and attitudes can lead to social, health and psychological problems including eating disorders and depression. Several studies have reported relations between eating behaviour with

poor self-esteem, body image, peer and family relationships (Riedan & Koff, 1997; Buddeberg-Fisher *et al.*, 1996; Grant & Fodor, 1988).

University students encounter pressures in not only having to cope with their studies but also to deal with personal, social and family concerns. When beset with psychosocial problems, they may succumb to poor eating behavior. Studies in Korea and Japan have reported poor eating habits and inappropriate dieting behavior among high school and university students (Kim, Kang & Kim, 1999; Nakamura *et al.*, 1999). Gender differences have been reported in several studies related to body image as reviewed by O'Dea (1995). Female students showed a more disturbed eating behavior and more instances of deviation from normal weight compared to male subjects (Buddeberg-Fischer *et al.*, 1996). In Malaysia, research on body image and dietary behavior is in its infancy.

This study was thus initiated with the general aim of investigating the relationship between psychological factors with dietary habits and food intake in young adults such as university students. Are people with low self esteem likely to consume different foods? What is the relationship between fear of being fat and nutrient intake, self esteem, body esteem, and dieting behavior? Are people who are depressed or anxious more likely to consume certain foods and not others? This study was a collaborative research effort between Universiti Putra Malaysia and the Health Sciences and Nutrition Division of the Commonwealth Scientific and Industrial Research Organization (CSIRO) in Australia, to investigate the above questions and other aspects in a cross-cultural context.

This article reports the results obtained from a sample of Malaysian university students. Specifically, the Malaysian study was undertaken with the following objectives:

- (a) To determine university students' eating behavior including body weight control and the extent of fear of being fat
- (b) To determine their social self concept that reflects the five selves namely, the psychological self, the social self, the sexual self, the family self and the physical self.
- (c) To compare eating behavior and social self concept determinants between male and female students.
- (d) To examine the correlations between body mass index, eating behavior and social self concept determinants among male and female students

Figure 1 illustrates the study framework on the determinants of eating behavior and self concept. Table 1 further elaborates on the indices for the measuring of each of the determinants of eating behavior and self concept. The focus of this article is on comparing eating behaviour and self concept between male and female students.

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MATERIALS & METHODS

Subjects

Respondents for the study were selected from undergraduate students in a Malaysian university. Flyers describing the study and inviting male and female students aged between 18 to 30 years to participate were circulated on the campus. Volunteers were recruited according to a pre-determined convenient sample size of 60 Malay, 60 Chinese and 60 Indian students (with equal number of male and female participants in each ethnic group). Thus, a total of 90 male and 90 female respondents were included in the study that was carried out between May to August in 1999. Respondents who agreed to participate were requested to sign a consent form. Anthropometric measurements were taken of all the respondents. They also had to complete a set of self-report questionnaires.

Anthropometry

All respondents were measured for body weight, height, waist and hip circumference. Body weight was taken using a digital weighing scale (TANITA, Japan) to the nearest 0.1kg. Subjects were weighed bare-footed and with light clothing on. Height was recorded using a body meter (SECA, Germany) to the nearest 0.1cm. The tape was suspended two meters from the floor against a straight wall.

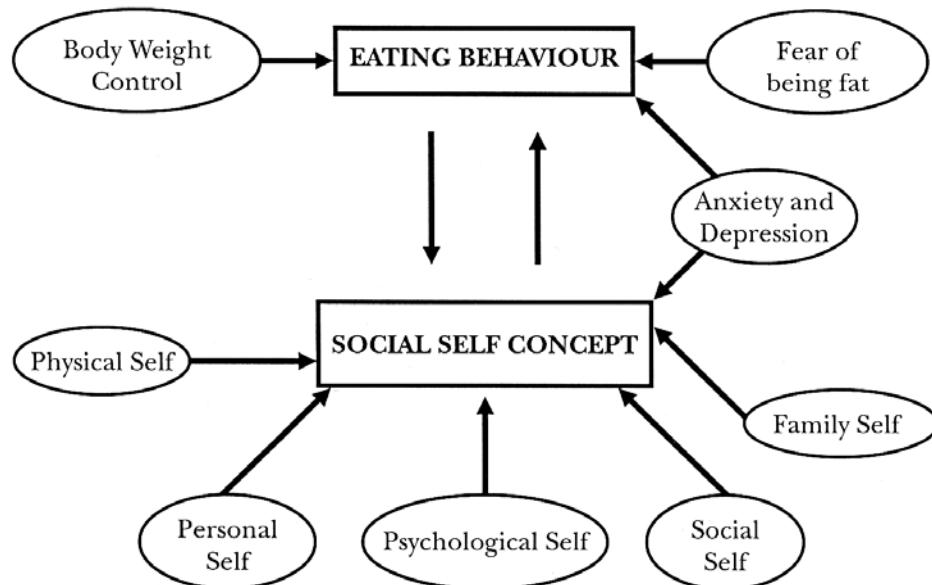


Fig 1. Framework of the determinants for eating behavior and social self-concept

Questionnaires

The questionnaires pertaining to eating behavior and self-concept were adapted from the 1995 CSIRO Survey of Australian Adolescent Eating Habits (Worsley & Skrzypiec, 1997).

(1a) *Eating Behavior*

As shown in Table 1, three indices based on Stunkard & Messick's Eating Behaviour Scales (1985) were used to assess directly eating behavior:

- (i) Index of Restrained Eating (12 items)
- (ii) Index of Uninhibited Eating (12 items) and
- (iii) Index of Desire to Eat (10 items)

'Restrained Eating' is the degree to which one restricts the amount and types of foods consumed, while 'Uninhibited Eating' is the extent to which one allows himself/herself to eat even when he/she is not hungry or is already full. 'Desire to eat' indicates the frequent feeling of hunger or perceived hunger and wishing to eat at any time. These three categories comprised statements that could be answered either "True" or "False". One point was given for each positive statement answered true and one point for each negative statement answered false. A high score indicates respectively a high degree of restrained eating, uninhibited eating or a strong desire to eat.

Table 1. Indices of eating behaviour and social self concept

Dimension	Determinants	Indices
Eating Behavior	Fear of being fat Body weight control	Restrained Eating Uninhibited Eating Desire to Eat Fear of being Fat Mild Dieting Extreme Dieting
Social Self Concept	Personal self Psychological self Social self Family self Physical self	Self Esteem Body and Self-image Social Relationship Vocal and Educational Goals Family Relationships Physical Attractiveness (male); Sexual Attractiveness (female) Upper Body Strength (male); Weight Concern (female)

(1b) *Fear of being fat*

An important factor that influences eating behaviour is the extent to which an individual is afraid of becoming overweight or obese. This study used Goldfab *et al* (1985)'s Fear of Fat Scale to assess a person's concern of becoming fat. The scale consisted of 10 statements each of which carried a 4-point scale response that ranged from "Very untrue" (1 point) to 'Very true" (4 points). The higher the score obtained, the higher is the fear of fat. Goldfab's scale was found

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reliable by Akan & Grilo (1995) in a cross-ethnic study on the influence of socio-cultural factors on eating attitudes and behavior in college women.

(1c) Weight control

Another important determinant of eating behavior is whether the individual is practising any form of dietary control in order to reduce body weight. This study used Benbrook's Body Weight Control Questionnaire (1988) to appraise dieting behavior. Benbrook's questionnaire comprises an Index of Mild Dieting Behavior (9 items) and an Index of Extreme Dieting Behavior (7 items). The questionnaire includes 'common' weight loss strategies such as skipping meals and eating diet foods, as well as more extreme actions such as induced vomiting and taking laxatives. For each item answered 'Yes', 2 points were given for a practice that is done on an 'Often' basis and 1 point for 'Sometime' basis. No point was given for "No" answers. The higher the score, the higher is the frequency of taking actions toward reducing weight.

(2) Social self concept

The social self concept comprises several perspectives. These include the *Psychological Self* (the mental picture and feelings that young adults have about their bodies and health), *Family Self* (how young adults feel about their parents, the kind of relationships they have with them, and the emotional atmosphere of the home; worth as a family member), the *Social Self* (assesses peer relationships and friendship patterns, and how well an individual fares in accomplishing the tasks of learning and planning for a vocational future); the *Physical Self* (feelings about various parts of the body, physical condition, appearance and body strength); and the *Personal Self* (feelings of personal worth with regard to skills, abilities and characteristics) (Offer *et al.*, 1988). This study applied Offer's Self-Image Questionnaire to assess the following "selves", each of which has its own indices:

- (i) *Psychological self* - Index of Body and Self Image
- (ii) *Family self* - Index of Family Relationships
- (iii) *Social self* - Index of Social Relationships and Index of Vocational and Educational Goals.

All these indices consist of a total of 42 statements, each of which may be answered as follows:

Does not describe me/my situation at all	1 point
Does not really describe me	2 points
Does not quite describe me	3 points
Describes me fairly well	4 points
Describes me well	5 points
Describes me very well	6 points

The higher the score, the stronger is the positive feeling for the self and his/her relationships with others. Offer's Questionnaire was found reliable in determining self-concept in a cross-cultural study involving 10 countries including Japan and Taiwan (Offer *et al.*, 1988).

Beside the three “selves” elaborated above, the physical self also has an important influence on self concept. One’s body image is closely related to one’s self esteem (Richards *et al.*, 1990). The Body Esteem Scale of Franzoi and Shields (1984) was used to measure the physical self.

(iv) *Physical self*

- | | |
|----------|--|
| Male - | Index of Physical Attractiveness (11 statements) |
| | Index of Upper Body Strength (9 statements) |
| | Index of Physical Condition (13 items) |
| Female - | Index of Sexual Attractiveness (13 statements) |
| | Index of Weight Concern (10 statements) |
| | Index of Physical Condition (9 items) |

Response to each item throughout this section was according to a 5-point scale that ranged from “Have strong negative feelings” (1 point) to “Have strong positive feelings” (5 points). Thus, the higher the score, the stronger is the positive feeling towards one’s body and physical condition.

(v) *Personal self- Index of Self Esteem*

As for assessing the personal self, this study used Rosenberg’s Self Esteem Scale (1979) which has been used extensively with teenagers and young adults. Feelings about the self were found to correlate with feelings about the body (Button *et al.*, 1997; Chubb, Fertman & Ross, 1997). The questionnaire consisted of 10 statements and response to each item was based on a 4-point scale which ranged from “Strongly disagree” (1 point) to “Strongly agree” (4 points) for positive statements. The reverse point scale was applied for negative statements (1 point for strongly agree to 4 points for strongly disagree).

(3) *Anxiety and depression*

Both eating behavior and self concept may be affected by feelings of anxiety and depression. In the case of university students, stress from academic, financial and social pressure may lead to anxiety and depression that could have deleterious effects on self esteem and health. The Zigmond and Snaith Hospital Anxiety/Depression Scale (HADS) (1983) that was originally developed for use in hospital settings, has been applied in non-clinical fields including assessing the impact of conditions that might affect mental health and quality of life. The HADS questionnaire appraises anxiety (7 items) and depression (7 items) for the Indices for Anxiety and Depression. The response for each item was according to a 4-point scale from 0-3 points, taking into consideration whether the statement is positively or negatively posed. Interpretation of the HADS scoring is based on Snaith and Zigmond (1994) as follows:

<i>Score</i>	<i>Level of anxiety and depression</i>
0-7	Normal
8-10	Mild
11-14	Moderate
15-21	Severe

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Table 2. Demographic and anthropometric characteristics of study subjects (n=180)

	Male n=90 n(%)	Female n=90 n(%)	All n=180 n(%)
Ethnicity			
Malay	30 (33.3)	30 (33.3)	60 (33.3)
Chinese	30 (33.3)	30 (33.3)	60 (33.3)
Indian	30 (33.3)	30 (33.3)	60 (33.3)
Age (years)			
19-24	63 (70.0)	70 (77.8)	133 (73.9)
25-30	27 (30.0)	20 (22.2)	47 (26.1)
Academic Programme			
Medicine, Biomedicine	20 (22.2)	25 (27.8)	45 (25.0)
Nutrition, Food Science	18 (20.0)	27 (30.0)	45 (25.0)
General Science, Engineering, Computer science	29 (32.2)	23 (25.6)	52 (28.9)
Commerce, Social Science, Others	23 (25.6)	15 (16.7)	38 (21.1)
Classification of BMI (kg/m²)			
<18.5	14 (15.6)	22 (24.4)	36 (20.0)
18.5-24.9	52 (57.8)	58 (64.4)	110 (61.1)
25.0-29.9	20 (22.2)	9 (10.0)	29 (16.1)
≥30.0	4 (4.4)	1 (1.1)	5 (2.8)
	Mean ± SD	Mean ± SD	Mean ± SD
Weight (kg)	64.8 ± 12.3	51.5 ± 7.9	58.1 ± 12.3
Height (cm)	169.2 ± 9.3	157.5 ± 5.7	163.4 ± 9.7
Body mass index (BMI)	22.7 ± 4.7	20.8 ± 3.1	21.7 ± 4.1

RESULTS

Anthropometric characteristics

The majority of the respondents were between 19-24 years of age (73.9%) while the rest were between 25-30 years (Table 2). Approximately half of them were pursuing studies related to biological sciences while the other half were from the social sciences. The mean body weight of the male and female students were 64.8 kg and 51.5 kg respectively, while their corresponding mean body mass index (BMI) were 22.7 kg/m² and 20.8 kg/m². Table 2 also shows the classification of BMI values of the students according to the criteria of WHO (1997). Overall, 61.1% had normal BMI (18.5-24.9 kg/m²). One-fifth of them can be classified as underweight or chronic energy deficient (BMI <18.5 kg/m²), with more females (24.4%) than males (15.6%) in this category. Almost one-fifth (18.9%) can be described as overweight (26.6% were males and 11.1% females).

Eating behavior

(a) *Restrained eating* (Table 3a)

Generally, female students tend to exercise more eating restraint as shown by the mean Index of Restrained Eating of 5.5 ± 2.6 for males and 6.6 ± 2.8 for females (out of a maximum of 12 points each), and this difference is significant ($t=2.65$, $p=0.009$). The Restrained Eating statement that was answered true by the highest percentage of the female students (66.7%) was “*If I eat food that I know I should not eat, I eat less of other foods for a while to make up for it*”. As for the male students, the statement that was answered true by most students (64.4%) was “*When I have eaten the amount of food I think I should eat, I am usually good about not eating any more*”.

Table 3a. Percentage and index of restrained eating

Items	% Subjects who answered TRUE		
	Male(n=90)	Female(n=90)	All(n=180)
1. When I have eaten the amount of food I think I should eat, I am usually good about not eating any more	64.4	62.2	63.3
2. If I eat food that I know I should not eat, I eat less of other foods for a while to make up for it	58.9	66.7	62.8
3. I eat anything I want, anytime I want	60.0	46.7	53.3
4. I consciously don't eat too much at meals in order not to gain weight	44.4	56.7	50.6
5. I often stop eating when I am not really full as a way of limiting the amount of food that I eat	45.6	52.2	48.9
6. I have a fairly good idea of the number of calories in foods I usually eat	43.3	53.3	48.3
7. I do not eat some foods because they make me fat	42.2	54.4	48.3
8. I deliberately take small helpings to control my weight	42.2	52.2	47.2
9. I pay a lot of attention to changes in my body shape	43.3	46.7	45.0
10. Life is too short to worry about dieting	53.3	36.7	45.0
11. I enjoy eating too much to spoil it by counting calories or watching my weight	31.1	26.7	28.9
12. I count calories as a way of controlling my weight	14.4	17.8	16.1
Index of restrained eating	5.5 ± 2.6	6.6 ± 2.8	

Difference between gender is significant ($t=2.65$; $p=0.009$)

Maximum score is 12 points, 1 point for each positive statement answered true and 1 point for each negative statement answered false (No.3, 10 and 11)

(b) *Uninhibited eating* (Table 3b)

The overall mean Index for Uninhibited Eating was 6.0 ± 2.0 and 5.5 ± 2.0 for the male and female subjects respectively (out of a total of 12 points each), but there was no significant difference between the sexes. The score indicates a moderate proportion of the students showed eating behavior that can be characterized as uninhibited eating. More than half of the students expressed agreement with these statements “*Sometimes things just taste so good that I keep on eating even when I am no longer hungry*” (68.9%) and “*It is difficult for me to leave something on my plate*” (53.3%).

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Table 3b. Percentage and index of uninhibited eating

Items	% Subjects who answered TRUE		
	Male(n=90)	Female(n=90)	All(n=180)
1. Sometimes things just taste so good that I keep on eating even when I am no longer hungry	71.1	66.7	68.9
2. It is difficult for me to leave something on my plate	46.7	60.0	53.3
3. I usually eat too much when I go out e.g. at parties or picnics	51.1	32.2	41.7
4. When I smell or see hot chips I feel hungry, even if I have just finished eating	40.0	42.2	41.1
5. Without even thinking about it I take a long time to eat	38.9	38.9	38.9
6. When I am lonely, I eat to make myself feel better	35.6	24.4	30.0
7. When I feel anxious, I find myself eating	23.3	35.6	29.4
8. When I feel depressed, I often overeat	22.2	35.6	28.9
9. Sometimes when I start eating, I just can't seem to stop	25.6	28.9	27.2
10. When I am with someone who is overeating, I usually overeat too	25.6	24.4	25.0
11. I have gone on slimming diets more than once because my weight goes up and down	12.2	16.7	14.4
12. When I am on a diet, if I eat food that is not allowed, I often then eat lots of other food that is not allowed	15.6	8.9	12.2
Index of uninhibited eating	6.0 ± 2.0	5.5 ± 2.0	

Maximum score is 12 points, 1 point for each positive statement answered true and 1 point for each negative statement answered false (No. 5, and No. 2)

(c) Desire to eat (Table 3c)

The mean Index for Desire To Eat between the male subjects (4.9 ± 2.6) and female (4.3 ± 2.1) out of a total of 10 points was not statistically significant, indicating that both sexes have a similar attitude toward the desire to eat. More than half of the students, both male and female, agreed with several statements that indicated that they feel hungry often. A high percentage of both sexes expressed agreement with such statements as, “*At certain times of the day I get hungry because I am used to eating at that time*” (82.8%), “*I sometimes get very hungry late in the evening or at night*” (70.0%), and “*I often feel so hungry that I just have to eat something*” (54.4%).

Table 3c. Percentage and index of desire~ to eat/perceived hunger

Items	% Subjects who answered TRUE		
	Male(n=90)	Female(n=90)	All(n=180)
1. At certain times of the day I get hungry because I am used to eating at that time	86.7	78.9	82.8
2. I sometimes get very hungry late in the evening or at night	70.0	70.0	70.0
3. When I see something really nice, I often get so hungry that I have to eat it right away	50.0	37.8	43.9
4. Being with someone who is eating often makes me hungry enough to eat too	41.1	42.2	41.7
5. I am always hungry enough to eat at any time	27.8	20.0	23.9
6. I am usually so hungry I eat more than three times a day	40.0	34.4	37.2
7. I get so hungry that my stomach often feels like a bottomless	35.6	24.4	30.0

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8. I am always hungry so it is hard for me to stop eating before I have finished the food on my plate	35.6	18.9	27.2
9. I often feel so hungry that I just have to eat something	52.2	56.7	54.4
10. Dieting is hard for me because I just get too hungry	50.0	42.2	46.1
Index of desire to eat	4.9 ± 2.6	4.3 ± 2.1	

Maximum score is 10 points, 1 point for each statement

Fear of being fat (Table 4)

The mean Index of Fear among the male and female subjects was 22.8 ± 5.7 and 22.9 ± 6.8 respectively out of a maximum of 40 points. This result indicates that the students do not have a high level of fear of becoming fat. There was no significant difference between the genders on the concern with the risk of putting on weight. Nonetheless, a high percentage of males and females agreed that "*I believe there is real risk that I will become overweight some day*" and "*My biggest fear is of becoming fat*". This finding indicates that these students do harbour some concern of becoming fat.

Table 4. Percentage and index of fear of being fat

Items	% Subjects who answered TRUE		
	Male(n=90)	Female(n=90)	All(n=180)
1. I believe there is a real risk that I will become overweight some day	73.3	65.6	69.4
2. My biggest fear is of becoming fat	61.1	73.3	67.2
3. Becoming fat would be the worst thing that could happen to me	52.2	55.6	53.9
4. I don't understand how overweight people can live with themselves	57.8	28.9	43.3
5. I am afraid to gain even a little weight	36.7	47.8	42.2
6. If I stopped concentrating on controlling my weight, chances are I would become very fat	40.0	41.1	40.6
7. There is nothing that I can do to make the thought of gaining weight less painful and frightening	32.2	26.7	29.4
8. I feel like all my energy goes into controlling my weight	27.8	24.4	26.1
9. If I eat even a little, I may lose control and not stop eating	23.3	21.1	22.2
10. Staying hungry is the only way I can guard against losing control and becoming fat	22.2	20.0	21.1
Index of fear of being fat	22.8 ± 5.7	22.9 ± 6.8	

Maximum score is 40 points

Body weight control (Table 5a and Table 5b)

Both the Index of Mild Dieting and Index of Extreme Dieting Behaviour showed low mean scores, indicating that the students generally were not taking actions to control their dietary intake. There were no significant gender differences for both the dieting indices. The type of mild dieting behavior practised most often is to "*Cut down on the amount of all types of food*

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eaten to lose weight". Most of the practices for the Index of Extreme Dieting Behavior were not carried out by the students.

Table 5a. Score for index of mild dieting behavior (Body Weight Control)

Items	Male(n=90)	Female(n=90)	All(n=180)
1. Cut down on the amount of all types of food to lose weight?	0.8	0.6	0.7
2. Skipped one meal a day e.g. breakfast to lose weight?	0.6	0.8	1.4
3. Stopped eating certain foods e.g. fatty foods, potatoes, bread, biscuits, to lose weight?	0.7	0.6	1.3
4. Stopped having snacks between meals to lose weight?	0.3	0.7	1.0
5. Eaten only fruit and vegetables to lose weight?	0.2	0.5	0.7
6. Eaten "diet" foods to lose weight?	0.2	0.4	0.6
7. Skipped two meals a day e.g. breakfast & lunch to lose weight?	0.3	0.2	0.5
8. Haven't had anything to eat just drank water, black coffee/tea, or diet drinks to lose	0.2	0.2	0.4
9. Had nothing to eat for 1 or more days to lose weight?	0.1	0.2	0.3
Index of mild dieting	3.4	4.6	8.0

Maximum of 2 points for each statement answered 'yes, often'

Total score for all statements =18

Table 5b. Score for index of extreme dieting behavior (Body Weight Control)

Items	Male(n=90)	Female(n=90)	All(n=180)
1. Bought pills of laxatives from the chemist to help you lose weight?	0.07	0.09	0.16
2. Smoked to lose weight?	0.03	0.02	0.05
3. Eaten so much that you have made yourself sick?	0.53	0.77	1.30
4. Skipped two meals a day e.g. breakfast & lunch to lose weight?	0.28	0.19	0.47
5. Haven't had anything to eat just drank water, black coffee/tea, or diet drinks to lose weight?	0.13	0.24	0.37
6. Had nothing to eat for 1 or more days to lose weight?	0.08	0.16	0.24
7. Made yourself vomit to lose weight?	0.04	0.18	0.22
Index of extreme dieting	1.16	1.65	2.81

Maximum of 2 points for each statement answered 'yes, often'

Total score for all statements =14

Social self concept

(a) Psychological self (Index of Body and Self Image) (Table 6a)

The mean Index of Body and Self-image, respectively 32.6 ± 5.2 and 32.7 ± 4.9 out of a maximum of 48 for males and females appear to indicate that the students in general have a moderate level of positive feelings about themselves and their worth socially. There was no significant difference in this respect between the sexes. A majority of the students (82.8%) expressed confidence in their overall physical self ("I feel strong and healthy"), and "The picture I have of

myself in the future satisfies me”. In contrast, there was a noteworthy proportion (40.6%) who expressed a lack of confidence in the mental picture of themselves (“*Very often, I think I am not at all the person I would like to be*”). More males (39%) than females (20%) reported “*I seem to be forced to imitate the people I like*”.

Table 6a. Index of body and self image (Psychological Self)

Items	% Subjects who answered positively		
	Male(n=90)	Female(n=90)	All(n=180)
1. I feel strong and healthy	85.6	80.0	82.8
2. I am proud of my body	71.1	66.7	68.9
3. Very often I think I am not at all the person I would like to be	43.3	37.8	40.6
4. In the past year I have been very worried about my health	35.6	35.6	35.6
5. I seem to be forced to imitate the people I like	38.9	20.0	29.4
6. I frequently feel ugly and unattractive	22.2	20.0	21.1
7. The picture I have of myself in the future satisfies me	80.0	85.6	82.8
8. When others look at me they must think that I am poorly developed	20.0	17.8	18.9
Index of body and self image	32.6±5.2	32.7±4.9	

Maximum score is 48 points for each gender

(b) Family self (Index of Family Relationships) (Table 6b)

The students obtained quite a high score for the Index of Family Relationships indicating that they generally have a satisfactory relationship with their families. The female subjects have a higher mean score (80.7 ± 8.1) than the males (77.0 ± 10.9), out of a maximum score of 108 points for this index. The difference between the sexes is significant ($t=2.57$, $p=0.01$). Thus, female students appear to enjoy better relationships with their families than the males. Notwithstanding this statistical difference, most of the students regardless of gender, expressed positive feelings towards their families. For example, 92.2% agreed that “*I think that I will be a source of pride to my parents in the future*”, and “*Most of the time my parents are satisfied with me*” (87.2%). A majority also said that they play a part in making family decisions and that their parents get along with each other. Nevertheless, compared with the females, a higher percentage of the male students tend to agree with statements that indicate poor relationships with family members (Statements No. 8 to No. 18 in Table 6b).

Table 6b. Index of family relationships (Family Self)

Items	% Subjects who answered positively		
	Male(n=90)	Female(n=90)	All(n=180)
1. I think that I will be a source of pride to my parents in the future	90.0	94.4	92.2
2. Most of the time my parents are satisfied with me	84.4	90.0	87.2
3. I feel that I have a part in making family decisions	78.9	90.0	84.4
4. My parents are usually patient with me	81.1	80.0	80.6
5. Most of the time my parents get along well with each other	82.2	73.3	77.8
6. When I grow up and have a family, it will be in at least a few ways similar to my own	74.4	78.9	76.7

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7. When my parents are strict, I feel that they are right, even if I get angry	64.4	57.8	61.1
8. I like one of my parents much better than the other	52.2	35.6	43.9
9. Understanding my parents is beyond me	36.7	33.3	35.0
10. Usually I feel that I am a bother at home	37.8	20.0	28.9
11. I try to stay away from home most of the time	34.4	21.1	27.8
12. Very often parents do not understand a person because they had an unhappy childhood	26.7	17.8	22.2
13. My parents are almost always on the side of someone else, e.g. my brother/sister	18.9	16.7	17.8
14. I have been carrying a grudge against my parents for years	20.0	11.1	15.6
15. My parents are ashamed of me	15.6	6.7	11.1
16. Very often I feel that my father is no good	15.6	4.4	10.0
17. My parents will be disappointed in me in the future	14.4	4.4	9.4
18. Very often I feel that my mother is no good	11.1	2.2	6.7
Index of family relationships	77.0±10.9	80.7±8.1	

Maximum score is 108; Differences in the Index between gender is significant ($t=2.57$; $p=0.01$)

(c) Social self (Index of Social Relationships) (Table 6c)

The subjects showed a moderately high score for the mean Index of Social Relationships namely, 40.0 ± 6.1 and 40.5 ± 5.5 for males and females respectively, out of a maximum score of 54 points. There was no significant difference between the sexes. This result indicates that the students generally have no difficulties in making friends and enjoying a social life.

Table 6c. Index of social relationships (Social Self)

Items	% Subjects who answered positively		
	Male(n=90)	Female(n=90)	All(n=180)
1. I do not mind being corrected, since I can learn from it	93.3	90.0	91.7
2. Being together with other people gives me a good feeling	87.8	91.1	89.4
3. I do not have a particularly difficult time in making friends	84.4	83.3	83.9
4. I enjoy most parties I go to	71.1	72.2	71.7
5. If others disapprove of me I get terribly upset	42.2	45.6	43.9
6. I prefer being alone (than with other kids my age)	25.6	23.3	24.4
7. I find it extremely hard to make friends	20.0	13.3	16.7
8. I think that other people just do not like me	17.8	12.2	15.0
9. I usually feel out of place at picnics and parties	27.8	20.0	23.9
Index of social relationships	40.0±6.1	40.5±5.5	

Maximum score is 54 points for each gender

(d) Social self (Index of Vocational and Educational Goals) (Table 6d)

The mean score for the Index of Vocational and Educational Goals was 28.4 ± 2.7 for males and 28.6 ± 2.9 for females out a maximum of 42 points, with no significant differences between the genders. Most of the students agreed with the 4 statements that indicate optimism for their work and future. For example, this statement “A job well done gives me pleasure” was agreed by 95%

while 91.1% acknowledged that, “*I am sure that I will be proud about my future profession*”. A smaller percentage of the students agreed with the statements that indicated a low level of motivation and a preference for idleness. More male students agreed with such statements than the females, for example, “*I would rather sit around and loaf than work*” (21.1% males and 5.6% females), and “*I would rather be supported for the rest of my life than work*” (25.6% males and 16.7% females). It is also noted that 18% males and 12% females agreed with the statement that “*School and studying mean very little to me*”. Thus, there appears to be a noteworthy proportion of students in the university who are disinterested in their studies and vocational future.

Table 6d. Index of vocational and educational goals (Social Self)

Items	% Subjects who answered positively		
	Male(n=90)	Female(n=90)	All(n=180)
1. A job well done gives me pleasure	93.3	96.7	95.0
2. I am sure that I will be proud about my future profession	91.1	91.1	91.1
3. At times I think about what kind of work I will do in the future	87.8	88.9	88.3
4. I would rather be supported for the rest of my life than work	25.6	16.7	21.2
5. School and studying mean very little to me	17.8	12.2	15.0
6. I would rather sit around and loaf than work	21.1	5.6	13.3
7. I feel that there is plenty that I can learn from others	91.1	93.3	92.2
Index of vocational and educational goals	28.4 ± 2.7	28.6 ± 2.9	

Maximum score is 42 points for each gender

(e) Physical self (Index of Physical Attractiveness/Sexual Attractiveness) (Table 7a)

The students generally expressed positive feelings for their physical self. The mean Index of Physical Attractiveness among the males was 42.0 ± 6.5 out of a total of 55 points. The high scores that the subjects accorded to some parts of the body over other parts is difficult to interpret. For example, out of the 11 body parts, the feet received positive response from the highest percentage (98.9%) among the males, while the lowest percentage (86.7%) was for the buttocks. Perhaps the feet being less visible evoke fewer emotions than the buttocks. The mean score shown by the female counterpart for the Index of Sexual Attractiveness was 46.8 ± 7.5 out a maximum score of 65 points. Among this group, 96.7% expressed positive feelings for sex drive. This is an unexpected finding and it is believed that perhaps the subjects had misinterpreted that term for sexual appeal. The females expressed lowest feelings for the appearance of the eyes and body hair (78.9%).

Table 7a. Index of physical attractiveness/sexual attractiveness (Physical Self)

Physical Attractiveness	% Subjects who expressed having positive feelings		
	Male (n=90)	Sexual Attractiveness	Female (n=90)
Feet	98.9	Sex drive	96.7
Sex organs	97.8	Sex activities	94.4
Face	95.6	Body scent	93.3
Lips	95.6	Sex organs	93.3
Ears	95.6	Ears	93.3

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Hips	95.6	Lips	92.2
Chin	93.3	Appearance of cheeks/cheekbones	88.9
Appearance of cheeks/cheekbones	93.3	Chin	88.9
Appearance of eyes	92.2	Chest/Breast	87.8
Nose	92.2	Face	87.8
Buttocks	86.7	Nose	80.0
		Appearance of eyes	78.9
		Body hair	78.9
Index of physical attractiveness	42.5 ± 6.5	Index of sexual attractiveness	46.8 ± 7.5

Maximum score is 55 points for male and 65 points for female.

(f) *Physical self (Index of Upper Body Strength/ Weight Concern) (Table 7b)*

A majority of the male subjects expressed satisfaction with all their body in relation to physical strength. The mean score for the Index of Upper Body Strength was 33.9 ± 6.1 out a total of 45 points. As for the female students in this category, their mean score for the Index of Weight Concern was 33.6 ± 8.0 out of a maximum score of 50 points. This indicates an overall lower positive feeling among the female about their physical self in relation to weight gain, compared with the male counterparts' feelings toward gaining body strength. The female students expressed most concern for the appearance of their stomach and thighs.

Table 7b. Index of upper body strength/weight concern (Physical Self) % Subjects who expressed having positive feelings

Upper Body Strength	% Subjects who expressed having positive feelings		
	Male (n=90)	Weight Concern	Female (n=90)
Sex drive	100	Appetite	88.9
Biceps	93.3	Weight	81.2
Arms	92.2	Body build	80.0
Width of shoulders	92.2	Hips	76.7
Physical coordination	90.0	Legs	73.3
Muscular strength	88.9	Waist	72.2
Figure or physique	87.8	Buttocks	71.1
Body build	85.6	Appearance of stomach	65.6
Chest or breasts	85.6	Thighs	65.6
Index of upper body strength	33.9 ± 6.1	Index of weight concern	33.6 ± 8.0

Maximum score is 45 points for male and 50 points for female.

(g) *Physical self (Index of Physical Condition) (Table 7c)*

Most of the subjects indicated satisfaction for their physical conditions. The mean Index of Physical Condition for the males and females was 48.3 ± 8.8 out of 65 points and 32.6 ± 6.1 out of 45 points respectively. The males were most satisfied with their appetite (96.7%) and reflexes (93.3%), while the females were most contented with their reflexes (96.7%) and coordination

(95.6%). Lowest levels of satisfaction expressed were for the waist among the male (76.7%) and for physical stamina in the female (77.8%).

Table 7c. Index of physical condition (Physical Self)

Physical condition	% Subjects who expressed having positive feelings		
	Male (n=90)	Physical condition	Female (n=90)
Appetite		Reflexes	
Reflexes		Physical coordination	
Agility		Physical condition	
Health		Health	
Physical condition		Agility	
Thighs		Biceps	
Physical coordination		Muscular strength	
Figure level		Energy level	
Figure or physique		Physical stamina	
The appearance of stomach			
Physical stamina			
Weight			
Waist			
Index of Physical Condition	48.3 ± 8.8		32.6 ± 6.1

Maximum score is 65 points for male and 45 points for female.

(h) Personal self (Index of Self esteem) (Table 8)

The students showed a moderate level of self-esteem based on their scores for this category. The mean Index of Self Esteem was 29.6 ± 4.0 and 29.6 ± 3.9 for males and females respectively out of a total of 40. There was no significant difference between the genders. A majority of the subjects agreed with these positive statements, “*I feel that I have a number of good qualities*” (95.6%), “*I take a positive attitude towards myself*” (95.6%) and “*I am able to do things as well as most other people*” (93.3%). The negative statements in this category were agreed to by a relatively low percentage of the students with the exception of this statement, (82.2% agreed) “*I wish I could have more respect for myself*”. The statement that shows the biggest difference between the genders (42% males and 29% females) was “*I feel I do not have much to be proud of*”.

Table 8. Index of self esteem (Personal Self)

Items	% Subjects who agreed		
	Male (n=90) %	Female (n=90) %	All (n=180) %
1. All in all, I am inclined to feel that I am a failure	28.9	18.9	23.9
2. I feel I do not have much to be proud of	42.2	28.9	35.6
3. I wish I could have more respect for myself	87.8	76.7	82.2
4. I certainly feel useless at times	35.6	41.1	38.3
5. At times I think I am no good at all	25.6	23.3	24.4
6. I feel that I'm a person of worth, at least on an equal plane with others	87.8	86.7	87.2

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7. I feel that I have a number of good qualities	96.7	94.4	95.6
8. I am able to do things as well as most other people	91.1	95.6	93.3
9. I take a positive attitude toward myself	94.4	96.7	95.6
10. On the whole I am satisfied with myself	88.9	87.8	88.3
Index of self esteem	29.6 ± 4.0	29.6 ± 3.9	

Maximum score is 40 points for each gender

Anxiety and depression (Tables 9a and 9b)

The mean scores for the Index of Anxiety for male and female subjects were 7.95 ± 0.3 and 8.32 ± 0.2 respectively. Based on the HADS classification, these students might be described as experiencing a mild level of anxiety. Meanwhile, the result for the Index of Depression namely, 5.19 ± 0.4 as the mean score for males and 4.31 ± 0.3 for females indicates that the students are not suffering from depression. The differences between sexes for both the indices on anxiety and depression were not statistically significant.

Correlations between Body Mass Index, eating behavior and Social Self Concept for male students (Table 10a)

Firstly, in relating body mass index (BMI) of the students with eating behavior, no significant correlations were found among the indices of restrained eating, uninhibited eating and fear of being fat. However, it is found that BMI is significantly related with weight control practices exemplified by the indices of mild and extreme dieting ($r = 334$, $p = 0.001$; $r = 247$, $p = 0.019$ respectively). Thus, the higher the BMI, the more likely it is for the student to practise some form of dieting in order to reduce body weight. Meanwhile BMI levels of the male students did not show significant correlations with any of the social self-concept parameters. This finding indicates that among these students, whether they were underweight (15.6% of them), or overweight (26.6%) did not seem to affect their self esteem and relationships with others.

Table 9a. Score for Index of Anxiety

Items	Male (n = 90)	Female (n = 90)
1. I can sit at ease and feel relaxed	1.06	1.02
2. I get a sort of frightened feeling as if something awful is about to happen	1.53	1.56
3. I feel restless as if I have to be on the move	1.42	1.36
4. Worrying thoughts go through my mind	1.22	1.18
5. I get sudden feelings of panic	1.07	1.17
6. I feel tense or "wound up"	1.11	1.17
7. I get a sort of frightened feeling like "butterflies" in the stomach	0.54	0.86
Index of anxiety	7.95±0.3	8.32±0.2

Table 9b. Index of Depression

Items	Male (n = 90)	Female (n = 90)
1. I still enjoy the things I used to enjoy	0.66	0.57
2. I can laugh and see the funny side of things	0.34	0.24
3. I look forward with enjoyment to things	0.52	0.52
4. I can enjoy a good book or radio or TV programme	0.48	0.27
5. I feel cheerful	0.67	0.61
6. I feel as if I am slowed down	1.21	1.12
7. I have lost interest in my appearance	1.31	0.98
Index of Depression	5.19±0.4	4.31±0.3

Eating behavior, particularly uninhibited eating, was found to correlate significantly and negatively with the psychological self ($r = -0.415$, $p = 0.000$), family self ($r = -0.391$, $p = 0.000$), social self ($r = -0.212$, $p = 0.045$), physical self ($r = -0.258$, $p = 0.014$) and personal self ($r = -0.259$, $p = 0.014$). Thus, feelings of low self-esteem, negative feelings of personal worth among friends and family members can bring about undesirable eating behaviour. Eating preoccupation is known to be associated with negative emotional states. A person who is depressed or frustrated from failure to obtain rewards may seek consolation in eating (Homer & Utermoblen, 1993).

This study also showed that among the male university students, the various components of self concept have significant relationships with one another. For example, the psychological self correlates significantly with the social self (social relationship) ($r = 0.578$, $p = 0.000$), social self (vocational and educational goals) ($r = 0.286$, 0.006), family self ($r = 0.695$, $p = 0.000$), and personal self ($r = 0.390$, $p = 0.000$). These results indicate the inter-dependence between self-confidence and esteem with sense of competence and meaningful participation in families and the student community.

Female students (Table 10b)

Body mass index showed a significant relationship with eating behavior with respect to dieting practices and fear of becoming fat among the female students. Increased BMI may lead to a greater likelihood to exercise weight control and posses greater fear of becoming fat. Dieting behavior in the females with respect to mild dieting showed significant negative correlation with the personal self (self-esteem) ($r = -0.275$, $p = 0.009$). Female subjects with low self-esteem tend to practise some form of dieting.

Like the male students, uninhibited eating in females was also found to be significantly and negatively correlated with the psychological self ($r = -0.232$, $p = 0.028$), social self ($r = -0.275$, $p = 0.009$) and physical self ($r = -0.216$, $p = 0.04$ for physical attraction and $r = -0.255$, $p = 0.015$ for weight concern).

DISCUSSION AND CONCLUSION

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Eating behavior and social self-concept characteristics in a sample of university students were delineated and comparisons made between the genders. In this respect, there were some significant differences between the male and female students.

- (a) The female students appeared to be significantly more restrained in their eating behaviour than the males and this might explain the higher prevalence of underweight among the females (24.4%) than the males (15.6%). In contrast, the males showed a tendency for uninhibited eating habits which could lead to overweight. In this study, there was a higher prevalence of overweight among the males (26.6%) than in the females (11.1%).
- (b) In terms of having goals for the future, both male and female students generally feel encouraged about their future career prospects. However, male students consistently ranked higher than the females in answering affirmatively to each of the negative statements that imply indifference and indolence towards study and work.
- (c) A significant difference was found between the genders for the Index of Family Relationship, indicating that the female students tend to have a better relationship and understanding with their family members compared with the male counterparts.
- (d) Body mass index was found to show positive and significant correlations with dieting practices, indicating that male and female students with higher BMI status attempt to take action to control weight gain.
- (e) Majority of the male and female students expressed satisfaction for their body and physical conditions.
- (f) Emotionally, both male and female students seem to experience mild anxiety but were not depressed. The reasons for their anxiety remain to be identified.

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Table 10a. Correlations between BMI, eating behaviour and social self concept - male students (n=90)

	BMI	Restrained eating	Uninhibited eating	Fear of being fat	Mild dieting	Extreme dieting	Psychological self	Social self: Social	Social self: Vocation & relations	Family self	Physical self: Physical attractiveness	Physical self: Upper body	Personal self: Self esteem
BMI	-				0.334 (0.001)	0.247 (0.019)							
Restrained eating	-			0.307 (0.003)	0.332 (0.02)								
Uninhibited eating		-			0.242 (0.022)	-0.415 (0.000)	-0.226 (0.032)	-0.212 (0.045)	-0.391 (0.000)	-0.216 (0.041)	-0.258 (0.014)	-0.259 (0.014)	
Fear of being fat			-	0.372 (0.000)	0.343 (0.001)							-0.273 (0.009)	
Mild dieting				-	0.676 (0.000)								
Psychological self					-		0.578 (0.000)	0.286 (0.006)	0.695 (0.000)			0.390 (0.000)	
Social self: Social relationship						-		0.307 (0.003)	0.580 (0.000)			0.431 (0.000)	
Social self: Vocation & education goals							-		0.369 (0.000)	0.316 (0.002)		0.218 (0.039)	
Family self								-				0.391 (0.000)	
Physical self: Physical attractiveness									-		0.789 (0.000)	0.225 (0.033)	

Pearson correlation 2-tailed (p value)

Table 10b. Correlations between BMI, eating behaviour and social self-concept parameters - male students (n=90)

	BMI	Restrained eating	Un-inhibited eating	Fear of being fat	Mild dieting	Extreme dieting	Psychological self	Social self: Social	Social self: Vocation & relations	Family self	Physical self: Physical attractiveness	Physical self: Upper body	Personal self: Self esteem
BMI	-	0.366 (0.000)	0.243 (0.021)	0.377 (0.0000)									-0.326 (0.002)
Restrained eating	-			0.322 (0.002)	0.490 (0.000)								
Uninhibited eating	-		0.297 (0.005)	0.372 (0.000)	0.265 (0.011)	-0.232 (0.028)	-0.275 (0.009)				-0.216 (0.040)		-0.255 (0.015)
Fear of being fat	-			-	0.546 (0.000)	0.379 (0.000)				-0.260 (0.013)			
Mild dieting	-				-	0.696 (0.000)							-0.275 (0.009)
Extreme dieting	-					-					-0.212 (0.045)	-0.219 (0.038)	-0.267 (0.011)
Psychological self	-					-	0.403 (0.000)			0.530 (0.000)	0.261 (0.013)	0.241 (0.022)	0.547 (0.000)
Social self: Social relationship	-						-	0.336		0.445 (0.001)			0.382 (0.000)
Social self: Vocation & education goals	-						-		0.214 (0.043)				0.275 (0.009)
Family self	-							-					0.447 (0.000)
Physical self: Physical attractiveness	-							-				0.848 (0.000)	0.447 (0.000)
Physical self: Weight concern	-								-				0.371 (0.000)

Pearson correlation 2-tailed (p value)

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In conclusion, this initiative shows that more insightful studies on the extent that psychological and emotional factors have on the eating behavior among students, be they in schools or universities, should be undertaken using a larger sample size. Aspects such as the influence of family relationships on self concept and the lower levels of motivation related to study and career among male students also deserve more studies as they may have policy implications.

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