Gender Differences in Body Image Perception among Northern Malaysian Tertiary Students

Lee-Min Wong¹ and Yee-How Say¹*

¹Department of Biomedical Science, Faculty of Science, Universiti Tunku Abdul Rahman (UTAR) Perak Campus, Jalan Universiti, Bandar Barat, 31900 Kampar, Perak, Malaysia.

Authors' contributions

This work was carried out in collaboration between both authors. Author LMW performed the questionnaire, analyzed the data and co-wrote the paper. Author YHS conceived the study and wrote the paper. Both authors read and approved the final manuscript.

ABSTRACT

Aims: This study examined the association of socio-cultural and psychological factors with body shape concern, perception and body weight perception among tertiary students of Northern Malaysia.

Study Design: This is a cross-sectional study.

Place and Duration of Study: Universiti and Kolej Tunku Abdul Rahman (UTAR and KTAR), Perak campuses, between August 2011 and January 2012.

Methodology: A total of 1003 students were recruited (M = 431, F = 572; mean age 19.96 ± 1.51) and their body image perception were assessed using Body Shape Concern Questionnaire, Body Weight Perception Questionnaire, Body Shape Perception Questionnaire (Stunkard Silhouette Chart), Multidimensional Body Self Relations Questionnaire (MBSRQ), Rosenberg’s Self-Esteem Scale (RSE) and Quality of Life measurement.

Results: More females than males had problems with their body shape, where more females desired a thinner body size and vice versa for males. There was misperception of opposite sex’s perception of attractive body shape, where males chose a larger figure for attractive body shape of female compared to females themselves, and vice versa. Overweight students had significantly lower parental/peer acceptance, higher body shape satisfaction and hence lower body weight/shape anxiety, and made lesser body shape comparison compared to other counterparts. Quality of life and self-esteem were significantly negatively correlated with body satisfaction.

*Corresponding author: Email: sayyh@utar.edu.my;
Conclusion: Male and female Malaysian tertiary students were concerned with their body shape and perceived their body weight/shape differently.

Keywords: Body shape concern; body shape perception; body weight perception; college students; Malaysia.

1. INTRODUCTION

Body image can be defined as a person’s perception, attitude, and feeling about his or her body [1,2]. It can be differentiated into perceptual body image and attitudinal body image. According to Grogan [2], perceptual body image relates to the accuracy of self-estimation of body size to actual size, while attitudinal body image is assessed by measures of four components: satisfaction (evaluation of the body), affect (feelings associated with the body), cognitions (investment in appearance, beliefs about the body), and behaviors (such as avoidance of situations where the body will be exposed). Body shape concern, body weight perception and body shape perception are important components of body image. Positive body image or healthy body image is marked by realistic perception and acceptance toward the individual’s size and shape [3,4]. In contrast, negative body image or unhealthy body image comprised of shame, embarrassment, disappointment or anxiety about how the individual looks, and people who are categorized into this group may not have a realistic understanding of their body size and shape [3,4].

Social acceptance or approval from parents and peers would affect one’s body image perception [5,6]. Individuals may perceive pressures pertaining to their body image from family and friends, and therefore tend to have overvaluation of appearance [7,8]. A study showed that adolescent males receive weight-gain information and advices from their parents, friends or other experts [9]. Parental attitudes are important to promote positive and healthy body satisfaction in young people [10]. Influence of family and the roles that parents play in development will extend into adolescent and until the early adult years, which include university life [11-13]. Parental influence can be differentiated into direct influence and modeling [14]. Direct influence consists of direct parental communication, comments about weight and eating while parental modeling includes recall of parental strategies to manage weight. Wertheim et al. [15] stated that attitudes and behaviors related to one’s body can be learned via parental modeling, such as a parent expressing concern about her or his own weight, and expressing concern about their daughter’s or son’s weight through parental communication. Besides, increasing evidence show that friends are important contributors to the development of an individual’s body image perception, through the cultivation of appearance culture among friends [16]. Through conversations with friends, people internalize the values and beliefs of their friends by receiving appearance criticism or teasing, thus raising a social norm and appearance ideals [16]. When one does not meet with these appearance standards, one may develop negative body image [16]. Overweight and obese youth are more frequently teased or criticized about their weight compared to normal weight youth [17], while gender-wise, females are more influenced by peer pressure if compared to male university students [13].

Poor body image can affect one’s confidence to achieve their goals and negatively impact the happiness in life [4]. In addition, negative body image can increase cases of abnormal eating attitudes which include dietary restraint, binge-eating and other negative effects [8]. The number of subjects with eating disorders or abnormal eating attitude is increasing in non-Western countries [18]. Body image problems which include body shape dissatisfaction
and body weight dissatisfaction, cause stronger desire for dieting and pursuit of thinness [19]. People with positive body image are less worried about their appearance and they can spend more time on other activities that help to build up confidence [3]. Positive body image has strong relation with health, well being and intuitive eating. Individual with positive body image has stable weight, normal range body mass index, inner positivity and most importantly, they have an adaptive eating style based on connection with internal hunger and satiety cues [19].

White women prefer thin body size and white men prefer body with hypertrophied muscles [20,21], while black males prefer a heavier ideal female body size than their white counterparts [22]. In Asia, girls from Vietnam and Japanese prefer a thinner body image than the healthy body image but Japanese girls desire a smaller ideal size compared to Vietnam girls [23]. Besides, Vietnam boys desire a more muscular body compared to Japanese boys. Meanwhile, Taiwanese women have been affected by feminine ideal and they prefer thinness [24]. These indicate that there are socio-cultural differences in body image perception among different populations around the world.

In Malaysia, studies that focus on body image perception are limited, especially among young adults undergoing tertiary education. Therefore, this study was conducted to assess body shape concern, body weight perception and body shape perception among male and female Malaysian tertiary students of Universiti and Kolej Tunku Abdul Rahman (UTAR and KTAR), and to examine the association of socio-cultural and psychological factors with body image perception.

2. METHODOLOGY

2.1 Subject and Sampling Method

A cross-sectional study was conducted from August, 2011 until January, 2012 to get a picture of the roles of sociocultural and psychological factors in the body image perception among students of UTAR and KTAR in Kampar, Perak. Convenience sampling method was used to obtain the data from the students. Survey form was created through online at Kwik Survey Website and the website address was given to students who were invited to participate in this survey via the social media and e-mails. Besides, hard copies survey forms were also printed out and distributed by convenience sampling to students at cafeterias. The self-administered questionnaire consisted of English and Mandarin Chinese versions. All individuals participating in this study signed informed consent forms.

2.2 Measures

2.2.1 Personal details

This part of survey collected the personal details variable such as gender, age, ethnicity, field of study, currently in which year and semester, self-reported body weight and body height. Body mass index (BMI) was calculated based on the self-reported by using the formula: weight (kg)/height (m²). According to WHO/IOTF/IASO [25], subjects are classified as underweight if they have BMI <18.50 kg/m², normal weight if BMI between 18.50 kg/m² to 22.99 kg/m² overweight if BMI ≥23.00 kg/m².
2.2.2 Body shape concern questionnaire

It consisted of 5 simple questions which included whether the subjects were concerned with their body shape, did they have problems with their body shape, their main reason for concern, main role model and main source of advice.

2.2.3 Body weight perceptions questionnaire

There were 2 questions to test whether males and females in different BMI categories (underweight, normal weight and overweight) correctly perceived their body weight. They were asked whether they were very thin to very fat, as perceived by themselves, or by others. They were also asked for their desired body height and body weight changes.

2.2.4 Body shape perception questionnaire (stunkard silhouette chart)

The body shape perception of male and female students was assessed through the silhouette chart adapted from [26]. There were 9 silhouettes from very thin to obese for each gender. These silhouettes correspond to different BMI categories. There were 8 questions regarding body shape and participants needed to choose one figure from the silhouette chart for each question. Body satisfaction was examined through the differences between the current body shape and ideal body shape chosen by each student. Score of zero indicates satisfaction with current body shape, negative score indicates the desire to become thinner and positive score indicates the desire to become heavier. The internal consistency for the different sub-scales or dimensions as estimated by Cronbach’s α ranged from 0.68 - 0.85.

2.2.5 Multidimensional body self relations questionnaire (MBSRQ)

Twenty-eight items used to assess the attitudes towards body image was adapted from the Multidimensional Body-Self Relations Questionnaire [27]. This self-reported questionnaire uses a five point Likert type scale ranging from “definitely agree (1)” to definitely disagree (5)”. The 28 items were assigned into 9 subscales to assess different categories: 4 items for parental and peer acceptance, 2 items for importance of body shape, 3 items for comparison of body shape, 2 items for body shape confidence, 3 items for body shape satisfaction, 2 items for body weight satisfaction and 4 items for anxiety and preoccupation with body weight and shape. The score of each subscale for each student was obtained by adding the points of questions associated with each subsection and divided by the number of questions in each subsection [28]. The internal consistency for the different sub-scales or dimensions as estimated by Cronbach’s α ranged from 0.78 - 0.83.

2.2.6 Rosenberg’s self-esteem scale (RSE)

Rosenberg (1965) invented a Rosenberg’s Self-Esteem Scale (RSE) consisting of 10 items which was used to assess the level of self-esteem [29]. Each item was measured on a four-point Likert scale ranging from “strongly disagree (1)” to “strongly agree (4)”. There were 5 positive statements and another 5 negative statement (item no.1, 3, 4, 7, 10). The negative statements were reverse scored from “strongly disagree (4)” to “strongly agree (1)”. Higher score indicates higher level of self-esteem. Association of self-esteem and body satisfaction was examined among male and female students. The internal consistency for the different sub-scales or dimensions as estimated by Cronbach’s α ranged from 0.63 - 0.77.
2.2.7 Quality of life measurement

The measurement of quality of life in this survey consisted of 7 items adapted from Cooperative Information Project/ World Organization of National Colleges, Academies, and Academic Associations of General Practices/ Family Physicians (COOP/ WONCA) charts [30]. Students were asked about their changes towards physical fitness, daily activities, body pain, social activities, feelings, general health and quality of life. Each item of this modified questionnaire was measured ranging from 1 to 3. They ranged from “less effort” to “more effort” for daily and social activities, “increased” to “decreased” for bodily pain and “worse” to “better” for other items. Higher scores correspond to higher quality of life. Association of quality of life and body satisfaction was assessed. The internal consistency for the different sub-scales or dimensions as estimated by Cronbach’s α ranged from 0.69 - 0.78.

2.3 Statistical Analysis

Statistical analysis was performed using SPSS® for Windows® v16.0 software (SPSS, Chicago, IL). Descriptive statistics was used to obtain the information about distribution of subjects according sample characteristics such as race, age, BMI categories and field of study. Chi-square test was used to determine the differences in categorical data. Continuous data variables were tested for normal distribution by Kolmogorov-Smirnov test or Shapiro-Wilk test. If $P$ is more than .05, there is no significant departure of the data from normality. Student’s $t$-test was used to determine the differences between physical measurement means or the means of the questions that use the Likert scale. One-way ANOVA test was used to test for differences of means between more than two groups in body image attitude questionnaire and Duncan’s test was used for posthoc analysis. Mann-Whitney $U$ test was used to test for difference between two groups’ body image scores. The level of statistical significance was set at $P = .05$.

3. RESULTS

3.1 Subject Characteristics

The baseline characteristics of the subjects are shown in Table 1. The proportion of ethnicity of subjects in this study was reflective of the population in UTAR/KTAR. Majority of them come from the business field, followed by arts and social science, science and engineering. Table 1 also shows that there were more than half of the students were normal weight while the rest were almost equally distributed among underweight and overweight. More females were underweight (28.5%) compared to males (18.1%), while twice as many males were overweight compared to females.

3.2 Body Shape Concerns

Almost all of the students (91%) in UTAR and KTAR were concerned with their body shape as shown in Table 2. There was just slightly higher amount of female students (92.0%), those with normal weight (92.5%) and those from Arts and Social Sciences field (92.8%) who were concerned with their body shape compared to other categories. Therefore, there was no association between concern of body shape with gender, BMI category and field of study (all $P = .05$). Body shape problems were associated with gender as more females (63.8%) stated that they had problems with their body shape compared to males (48.7%). There were also more overweight students (72.8%) who encountered problems with their
body shape compared to normal (56.0%) and underweight students (45.6%). Compared to Science (50.2%), Arts and Social Sciences (54.8%) and Business (63.2%), more Engineering had problems with their body shape (67.5%).

Table 1. Sample characteristics

| Variables                  | Male      | Female    | Total      |
|----------------------------|-----------|-----------|------------|
|                            | (n = 431) | (n = 572) | (n = 1003) |
| Age (Mean ± SD)            | 20.03 ± 1.58 | 19.90 ± 1.46 | 19.96 ± 1.51 |
| n (%)                     | n (%)     | n (%)     | n (%)      |
| Ethnicity                  |           |           |            |
| Chinese                    | 421 (97.7) | 555 (97.0) | 976 (97.3) |
| Indian                     | 10 (2.3)   | 17 (3.0)   | 27 (2.7)   |
| Field of Study             |           |           |            |
| Science                    | 94 (21.8)  | 139 (24.3) | 233 (23.2) |
| Engineering                | 27 (6.3)   | 13 (2.3)   | 40 (4.0)   |
| Arts and Social Sciences   | 166 (38.5) | 197 (34.4) | 363 (36.2) |
| Business                   | 144 (33.4) | 223 (39.0) | 367 (36.6) |
| BMI category (kg/m²)       |           |           |            |
| Underweight (< 18.5)       | 78 (18.1)  | 163 (28.5) | 241 (24.0) |
| Normal weight (18.5 - 22.99) | 215 (49.9) | 319 (55.8) | 534 (53.2) |
| Overweight (≥ 23)          | 138 (32.0) | 90 (15.7)  | 228 (22.7) |

Figures in parenthesis are percentages within gender

The major reason students chose for concern on their body shape was to be healthy (40.5%), followed by to look good (33.6%). Other reasons were to gain more self-confidence (22.5%), others (24%) and to have more friends (10%). More females (37.1%) than males (29%) were concerned with their body shape because of the desire to look good. Higher amount of overweight students (49.1%) chose to be healthy as their reason for concern with their body shape compared to underweight (38.6%) and normal weight students (37.6%). Besides, more underweight students (39.4%) were concerned with their body shape because they wanted to look good compared to normal (35.0%) and overweight students (24.1%). Compared to students from Science (39.1%), Arts and Social Sciences (38.8%), Business (41.7%), there were more than half of Engineering students (52.5%) who chose to be healthy as their reason for concern with their body shape (Table 2).

More than one-third (35.1%) of the students did not have a role model for body shape. Only few females (3.1%) chose sportsmen/sportswomen as their model for body shape compared to males (24.4%). In contrast, artistes or models contribute so much more influence on females’ (25.0%) body shape concerns than males (14.4%). Relatives (3.8%) and teachers/lecturers (0.2%) exerted little influence on their overall body shape concerns. More underweight students (44.8%) did not have a role model for body shape than normal (33.7%) and overweight (28.1%) students. Besides, higher percentage of students from Arts and Social Sciences (25.1%) were influenced by friends on their body shape than students from Science (21.0%), Engineering (22.5%) and Business (20.2%) (Table 2).
Table 2. Body shape concerns according to genders, BMI categories and fields of study.

| Questions regarding body shape concerns | Gender | BMI Category | Field of Study | Total |
|----------------------------------------|--------|--------------|----------------|-------|
|                                        | Male   | Female       | Underweight    | Normal | Overweight | Science | Engineering | Arts & Social Sciences | Business | n (%) | n (%) | n (%) | n (%) | n (%) | n (%) | n (%) | n (%) | n (%) |
| Are you concerned with your body shape?| Yes    | 383 (88.9)   | 526 (92.0)     | 214 (88.8)     | 494 (92.5) | 201 (88.2) | 203 (87.1) | 34 (85.0) | 337 (92.8) | 335 (91.3) | 909 (90.6) | 2.77; .10 |
|                                        | No     | 48 (11.1)    | 46 (8.0)       | 27 (11.2)      | 40 (7.5)    | 27 (11.8) | 30 (12.9) | 6 (15.0)  | 26 (7.2)   | 32 (8.7)   | 94 (9.4)   | 4.82; .09 |
| Do you have problems with your body shape?| Yes    | 210 (48.7)   | 365 (63.8)     | 110 (45.6)     | 299 (56.0)  | 166 (72.8) | 117 (50.2) | 27 (67.5) | 199 (54.8) | 232 (63.2) | 575 (57.3) | 22.87; <.001 |
|                                        | No     | 221 (51.3)   | 207 (36.2)     | 131 (54.4)     | 235 (44.0)  | 62 (27.2) | 116 (49.8) | 13 (32.5) | 164 (45.2) | 135 (36.8) | 428 (42.7) | 12.64; .005 |
| Main reason for concern                | To be healthy | 195 (45.2)   | 211 (36.9)    | 93 (38.6)      | 201 (37.6)  | 112 (49.1) | 91 (39.1)  | 21 (52.5) | 141 (38.8) | 153 (41.7) | 406 (40.5) | 12.17; <.001 |
|                                        | To gain more self-confidence | 89 (20.6) | 137 (24.0) | 46 (19.1) | 129 (24.2) | 51 (22.4) | 49 (21.0) | 7 (17.5) | 84 (23.1) | 86 (23.4) | 226 (22.5) | 12.17; <.001 |
|                                        | To look good | 125 (29.0) | 212 (37.1) | 95 (39.4) | 187 (35.0) | 55 (24.1) | 85 (36.5) | 10 (25.0) | 130 (35.8) | 112 (30.5) | 337 (33.6) | 12.17; <.001 |
|                                        | To have more friends | 6 (1.4) | 4 (0.7) | 1 (0.4) | 6 (1.1) | 3 (1.3) | 3 (1.3) | 0 (0.0) | 3 (0.8) | 4 (1.1) | 10 (1.0) | 12.17; <.001 |
|                                        | Others | 16 (3.7) | 8 (1.4) | 6 (2.5) | 11 (2.1) | 7 (3.1) | 5 (2.1) | 2 (5.0) | 5 (1.4) | 12 (3.3) | 24 (2.4) | 12.17; <.001 |
| Main source of influence/ role model for body shape | None | 143 (33.2) | 209 (36.5) | 108 (44.8) | 180 (33.7) | 64 (28.1) | 85 (36.5) | 13 (32.5) | 118 (32.5) | 136 (37.1) | 352 (35.1) | 12 (12.3) |
|                                        | Sportsmen/ Sportswomen | 105 (24.4) | 18 (3.1) | 18 (7.5) | 61 (11.4) | 44 (19.3) | 30 (12.9) | 9 (22.5) | 42 (11.6) | 42 (11.4) | 123 (12.3) | 12 (12.3) |
Table 2. continued

| Questions regarding body shape concerns | Gender | BMI Category | Field of Study |
|-----------------------------------------|--------|--------------|---------------|
|                                         | Male   | Female       | Underweight   | Normal | Overweight | Science | Engineering | Arts & Social Sciences | Business | Total |
|                                         | n (%)  | n (%)        | n (%)         | n (%)   | n (%)      | n (%)   | n (%)        | n (%)                | n (%)    | n (%) |
| **Main source of influence/role model for body shape** |        |              |               |         |            |         |              |                      |          |       |
| Friends                                | 82 (19.0) | 141 (24.7) | 41 (17.0)     | 123 (23.0) | 59 (25.9) | 49 (21.0) | 9 (22.5) | 91 (25.1) | 74 (20.2) | 223 (22.2) |
| Artistes/models                        | 62 (14.4) | 143 (25.0) | 54 (22.4)     | 114 (21.3) | 37 (16.2) | 46 (19.7) | 3 (7.5) | 80 (22.0) | 76 (20.7) | 205 (20.4) |
| Relatives                              | 6 (1.4)    | 32 (5.6)    | 8 (3.3)       | 23 (4.30) | 7 (3.1)   | 11 (4.7) | 1 (2.5) | 11 (3.0) | 15 (4.1) | 38 (3.8)    |
| Teachers/Lecturers                     | 1 (0.2)    | 1 (0.2)     | 0 (0.0)       | 1 (0.2)  | 1 (0.4)   | 1 (0.4) | 0 (0.0) | 1 (0.3) | 0 (0.0) | 2 (0.2)    |
| Others                                 | 32 (7.4)    | 28 (4.9)    | 12 (5.0)      | 32 (6.0) | 16 (7.0)  | 11 (4.7) | 5 (12.5) | 20 (5.5) | 24 (6.5) | 60 (6.0)    |
| No                                     | 221 (51.3) | 207 (36.2)  | 131 (54.4)    | 235 (44.0) | 62 (27.2) | 116 (49.8) | 13 (32.5) | 164 (45.2) | 135 (36.8) | 428 (42.7) |
| **Sources of advise for body image**   |        |              |               |         |            |         |              |                      |          |       |
| None                                   | 129 (29.9) | 121 (21.2)  | 71 (29.5)     | 126 (23.6) | 53 (23.2) | 57 (24.5) | 15 (37.5) | 92 (25.3) | 86 (23.4) | 250 (24.9) |
| Family members only                    | 26 (6.0)    | 67 (11.7)   | 16 (6.6)      | 57 (10.7) | 20 (8.8)  | 22 (9.4) | 2 (5.0) | 23 (6.3) | 46 (12.5) | 93 (9.3)    |
| Friends                                | 115 (26.7) | 108 (18.9)  | 50 (20.7)     | 122 (22.8) | 51 (22.4) | 51 (21.9) | 8 (20.0) | 76 (20.9) | 88 (24.0) | 223 (22.2) |
| Family members and friends             | 108 (25.1) | 231 (40.4)  | 81(33.6)      | 176 (30.0) | 82 (36.0) | 79 (33.9) | 12 (30.0) | 130 (35.8) | 118 (32.2) | 339 (33.8) |
| Professionals                          | 21 (4.9)    | 21 (3.7)    | 11(4.6)       | 22 (4.1) | 9 (3.9)   | 13 (5.6) | 2 (5.0) | 14 (3.9) | 13 (3.5) | 42 (4.2)    |
| Others                                 | 32 (7.4)    | 24 (4.2)    | 12 (5.0)      | 31 (5.8) | 13 (5.7) | 11 (4.7) | 1 (2.5) | 28 (7.7) | 16 (4.4) | 56 (5.6)    |

\( \chi^2 \) by Pearson’s chi-square test, significant at \( P = .05 \); figures in parenthesis are percentages within gender, BMI category and field of study.
About a quarter of students did not have a source of advice for their body image (24.9%), whereas about one-third of the students sought advice from family members and friends (33.8%), friends only (22.2%) and family members only (9.3%). Professional help was the least sought after (4.2%). Higher amount of underweight students did not ask for advice from other people (29.5%) than normal (23.6%) or overweight students (23.2%). Other than that, more students from Arts and Social Sciences (35.8%) asked advice on their body image from family members and friends, while more students from Business sought advice either from family members only (12.5%) or friends only (24.0%) compared to students from other fields (Table 2).

3.3 Body Weight Perception

Table 3 shows that majority of the male students in underweight, normal and overweight BMI categories had correct body weight perception. There was significant difference for self-perceived weight among different BMI categories for males as majority of the underweight males perceived themselves as thin, normal weight males perceived themselves as normal and overweight males perceived themselves as fat. There were just 21.8% of underweight and 26.1% of overweight males who thought they had a normal weight. Besides, there was also significant difference in the perception by others among different BMI categories for males. Nine percent of underweight and 35.5% of overweight males felt that others perceived them as having a normal weight. Equal percentages of normal weight males (20%) perceived themselves as thin and very thin or fat and very fat, while 43.7% and 12.5% felt that others perceived them as thin and very thin or fat and very fat, respectively (Table 3).

There was significant difference for self-perceived weight among different BMI categories for females but compared to males, more females in the overweight category correctly perceived themselves as fat (Table 3). There were only about half of the female students in the underweight and normal BMI categories who correctly perceived themselves as very thin/thin (41.7%) and normal (46.7%), respectively, while at the same time, almost half of the underweight females misperceived themselves as having normal weight. They were more than two-fold normal weight females (50.5%) who perceived themselves as fat/very fat compared to male students (20%). Besides, there was also significant difference in the perception by others among different BMI categories for females. Close to 20% of underweight or overweight females felt that others thought that they had a normal weight. Almost half of the normal weight females also felt that others thought them as thin/very thin (20.9%) and fat/very fat (25.7%).

Majority of the males and females had a strong desire to become taller, while most of the underweight males wanted to become heavier (76.9%), normal weight males wanted to maintain their weight (46.0%) and overweight males wanted to become lighter (80.4%) (Table 3). Almost all of the females in the overweight category desired to lose weight (90%) but majority of the underweight females wanted to maintain their weight or become lighter (73%), and most of the normal weight females wanted to lose weight (81.8%).
Table 3. Perception of body weight by self and others among male and female subjects

|                                | Males (actual BMI categories) | Females (actual BMI categories) |
|--------------------------------|-------------------------------|---------------------------------|
|                                | Underweight n (%) | Normal n (%) | Overweight n (%) | Total n (%) | Underweight n (%) | Normal n (%) | Overweight n (%) | Total n (%) |
| I feel that I am:              |                               |                               |                 |             |                   |               |                 |             |
| Very thin                      | 27 (34.6)                    | 9 (4.2)                      | 0 (0.0)         | 36 (8.4)    | 25 (15.3)         | 3 (0.9)       | 0 (0.0)         | 28 (4.9)    |
| Thin                           | 34 (43.7)                    | 34 (15.8)                   | 3 (2.2)         | 71 (16.5)   | 43 (26.4)         | 6 (1.9)       | 0 (0.0)         | 49 (8.6)    |
| Normal                         | 17 (21.8)                    | 129 (60.0)                  | 36 (26.1)       | 182 (42.2)  | 74 (45.4)         | 149 (46.7)   | 10 (11.1)       | 233 (40.7)  |
| Fat                            | 0 (0.0)                      | 42 (19.5)                   | 81 (58.7)       | 123 (28.5)  | 17 (10.4)         | 154 (48.3)   | 57 (63.3)       | 228 (39.9)  |
| Very fat                       | 0 (0.0)                      | 1 (0.5)                     | 18 (13.0)       | 19 (4.4)    | 4 (2.5)           | 7 (2.2)       | 23 (25.6)       | 34 (5.9)    |
| Others think that I am:        |                               |                               |                 |             |                   |               |                 |             |
| Very thin                      | 35 (44.9)                    | 22 (10.2)                   | 2 (1.4)         | 59 (13.7)   | 33 (35.9)         | 14 (6.1)      | 0 (0.0)         | 47 (13.7)   |
| Thin                           | 34 (43.6)                    | 72 (33.5)                   | 2 (1.4)         | 108 (25.1)  | 36 (39.1)         | 34 (14.8)     | 0 (0.0)         | 70 (20.3)   |
| Normal                         | 7 (9.0)                      | 94 (43.7)                   | 49 (35.5)       | 150 (34.8)  | 18 (19.6)         | 122 (53.3)    | 4 (17.4)        | 144 (41.9)  |
| Fat                            | 1 (1.3)                      | 25 (11.6)                   | 72 (52.2)       | 98 (22.7)   | 2 (2.2)           | 55 (24.0)     | 12 (52.2)       | 69 (20.1)   |
| Very fat                       | 1 (1.3)                      | 2 (0.9)                     | 13 (9.4)        | 16 (3.7)    | 3 (3.3)           | 4 (1.7)       | 7 (3.0)         | 14 (4.1)    |
| I want my height to be:        |                               |                               |                 |             |                   |               |                 |             |
| Shorter                        | 1 (1.3)                      | 5 (2.3)                     | 3 (2.2)         | 9 (2.1)     | 11 (6.7)          | 9 (2.8)       | 1 (1.1)         | 21 (3.7)    |
| Maintained/Normal              | 30 (38.5)                    | 45 (20.9)                   | 42 (30.4)       | 117 (27.1)  | 55 (33.7)         | 98 (30.7)     | 30 (33.3)       | 183 (32.0)  |
| Taller                         | 47 (60.3)                    | 165 (76.7)                  | 93 (67.4)       | 305 (70.8)  | 97 (59.5)         | 212 (66.5)    | 59 (65.6)       | 368 (64.3)  |
| I want my weight to be:        |                               |                               |                 |             |                   |               |                 |             |
| Lighter                        | 2 (2.6)                      | 66 (30.7)                   | 111 (80.4)      | 103 (41.4)  | 59 (36.2)         | 261 (81.8)    | 81 (90.0)       | 401 (70.1)  |
| Maintained/Normal              | 16 (20.5)                    | 99 (46.0)                   | 23 (16.7)       | 138 (32.0)  | 60 (36.8)         | 56 (17.6)     | 9 (10.0)        | 72 (20.8)   |
| Heavier                        | 60 (76.9)                    | 50 (23.3)                   | 4 (2.9)         | 114 (26.5)  | 44 (27.0)         | 2 (0.6)       | 0 (0.0)         | 46 (8.0)    |

χ² by Pearson’s chi-square test, significant at P = .05; figures in parenthesis are percentages within BMI category.
3.4 Body Shape Perception

As shown as Table 4 and Fig. 1, female students had a significantly smaller current body shape compared to male students. Male students desired an ideal body shape (3.96±0.88) nearly the same as their current body size (4.06±1.65) but females desired a smaller ideal body size (2.81±0.84) than their current body size (3.65±1.30). To be healthy and attractive, males chose a similar body size that is the same as current body shape (4.04±0.80 and 3.96±0.81 vs. 4.06±1.65) but females chose one that was smaller for males than the one desired by the male students themselves (3.64±0.82 vs. 4.04±0.80; 3.44±0.90 vs. 3.96±0.81). In contrast, females preferred a smaller size than their current body shape to be healthy and attractive (3.10±0.87 and 2.82±0.89 vs. 3.65±1.30) but males chose one that was bigger than the one desired by the female students themselves (3.49±0.80 vs. 3.10±0.87; 3.47±0.85 vs. 2.82±0.89).

Table 4. Perception of body shape based on figure rating scale of Stunkard et al. (1983) [26]

| Body shape                              | Male             | Female            | z    | P     |
|-----------------------------------------|------------------|-------------------|------|-------|
| Current body shape                      | 4.06±1.65        | 3.65±1.30         | -3.85| < .001|
| Ideal body shape                        | 3.96±0.88        | 2.81±0.84         | -18.31| < .001|
| The most healthy body shape (male)      | 4.04±0.80        | 3.64±0.82         | -7.84| < .001|
| The most healthy body shape (female)    | 3.49±0.80        | 3.10±0.87         | -7.76| < .001|
| Attractive body shape (same sex)        | 3.96±0.81        | 2.82±0.89         | -18.09| < .001|
| Attractive body shape (opposite sex)    | 3.47±0.84        | 3.44±0.90         | -0.39| .70   |
| Body dissatisfaction                     | 0.10±1.65        | 0.84±1.16         | -7.72| < .001|
| Desired a bigger body size (-9 to -1)   | 174 (40.4)       | 79 (13.8)         |      |       |
| Satisfied with current body size (0)    | 62 (14.4)        | 86 (15.0)         | 96.3 | < .001|
| Desired a thinner body size (+1 to +9)  | 195 (45.2)       | 407 (71.2)        |      |       |

z by Mann-Whitney U test, significant at P = .05; χ² by Pearson’s chi-square test, significant at P = .05

Body Dissatisfaction = current body shape - ideal body shape
Desired a bigger body size: current body shape < ideal body shape
Satisfied with current body size: current body shape = ideal body shape
Desired a thinner body size: current body shape > ideal body shape

Both males and females had positive value for body dissatisfaction but females expressed a significantly higher level of body dissatisfaction than males. Almost equal amounts of males and females were satisfied with their current body size. Besides, there was significantly higher amount of females (71.2%) who desired a thinner body size compared to males (45.2%). Compared to females (13.8%), there were significantly higher amount of males (40.4%) who desired a bigger body size. In short, body dissatisfaction was associated with gender, with the trend of females desiring a smaller body size and vice versa for males.

As shown in Fig. 2, majority of the male and female students chose silhouette no.9 as the least healthy body shape for males (80.7% and 82%, respectively) and females (80% and 81.3%, respectively). There was no significant difference for the ones who answered silhouette no.9 as the unhealthy body shape for males and females between genders (P = .61 and .62, respectively). Only small amount of students answered silhouette no.1 and other figures as the least healthy body shape for males (14% and 4.5%, respectively) and females (14.2% and 5.1%, respectively).
Fig. 1. Selection of body shape according to gender based on figure rating scale of Stunkard et al. (1983) [26]

Fig. 2. Numbers and percentages of subjects who answered silhouette no.9 (fattest), silhouette no.1 (thinnest) or other silhouettes as unhealthy
3.5 Attitudes towards Body Image

As shown in Table 5, overweight males and females had significantly lower parental and peer acceptance, and made significantly lesser comparison of their body shape compared to their underweight or normal weight counterparts. Besides, overweight females and males had significantly higher body shape satisfaction and hence significantly lower body weight and shape anxiety compared to their normal weight or underweight counterparts. Body shape confidence and body weight satisfaction were significantly highest among normal weight males and underweight females. However, the importance of body shape and body weight preoccupation did not differ among BMI categories for both genders and for males, respectively.

Table 5. Attitude towards body image among male and female subjects according to BMI category

| Subscales for attitude | Underweighta | Normal Weightb | Overweightc | Male          | Female         | Post hoc | Post hoc |
|------------------------|--------------|----------------|-------------|---------------|---------------|---------|---------|
|                        | M F          | M F            | M F         | P             | F P           |         |         |
| Parental acceptance   | 3.6 3.9      | 3.8 3.9        | 3.6 3.3     | 3.06 .048     | b>a=          | 16.36 c | .001 c  |
|                        | ± ± ± ± ± ± ± | ± ± ± ± ± ± ± | ± ± ± ± ±    | ± ± ± ± ±     | ± ± ± ± ±     | ± ± ± ± ± | ± ± ± ± ± |
| Peer acceptance       | 3.8 3.9      | 3.8 3.8        | 3.5 3.5     | 5.32 .005     | b>a=          | 9.83 c  | .001 c  |
|                        | ± ± ± ± ± ± ± | ± ± ± ± ± ± ± | ± ± ± ± ±    | ± ± ± ± ±     | ± ± ± ± ±     | ± ± ± ± ± | ± ± ± ± ± |
| Importance of body shape | 3.3 3.4  | 3.3 3.4  | 3.3 3.13  | .088 -        | 0.91 c        | .40 -    |         |
|                        | ± ± ± ± ± ± ± | ± ± ± ± ± ± ± | ± ± ± ± ±    | ± ± ± ± ±     | ± ± ± ± ±     | ± ± ± ± ± | ± ± ± ± ± |
| Comparison of body shape | 3.3 3.2  | 2.9 2.9        | 2.9 2.8     | 3.94 .02      | a>b>          | 9.24 a   | .001 c  |
|                        | ± ± ± ± ± ± ± | ± ± ± ± ± ± ± | ± ± ± ± ±    | ± ± ± ± ±     | ± ± ± ± ±     | ± ± ± ± ± | ± ± ± ± ± |
| Body shape confidence | 2.9 2.7      | 3.0 2.6        | 2.6 2.3     | 8.9 <         | b>a=          | 12.08 a  | .001 c  |
|                        | ± ± ± ± ± ± ± | ± ± ± ± ± ± ± | ± ± ± ± ±    | ± ± ± ± ±     | ± ± ± ± ±     | ± ± ± ± ± | ± ± ± ± ± |
| Body shape satisfaction | 2.8 3.2      | 3.1 3.5        | 3.4 3.7     | 20.6 <        | c>b>          | 18.84 c  | .001 a   |
|                        | ± ± ± ± ± ± ± | ± ± ± ± ± ± ± | ± ± ± ± ±    | ± ± ± ± ±     | ± ± ± ± ±     | ± ± ± ± ± | ± ± ± ± ± |
| Body weight satisfaction | 2.4 2.7      | 2.8 2.1        | 2.3 1.8     | 15.58 <       | b>a=          | 30.4 a   | .001 c  |
|                        | ± ± ± ± ± ± ± | ± ± ± ± ± ± ± | ± ± ± ± ±    | ± ± ± ± ±     | ± ± ± ± ±     | ± ± ± ± ± | ± ± ± ± ± |
| Body weight and shape anxiety | 3.8 3.5      | 3.6 3.1        | 3.4 3.0     | 11.81 <       | a>b>          | 20.33 a  | .001 c  |
|                        | ± ± ± ± ± ± ± | ± ± ± ± ± ± ± | ± ± ± ± ±    | ± ± ± ± ±     | ± ± ± ± ±     | ± ± ± ± ± | ± ± ± ± ± |
| Body weight and shape preoccupation | 2.6 2.6      | 2.6 2.4        | 2.5 2.6     | 0.56 . <      | 6.77 c        | 0.01 a   | b c>    |
|                        | ± ± ± ± ± ± ± | ± ± ± ± ± ± ± | ± ± ± ± ±    | ± ± ± ± ±     | ± ± ± ± ±     | ± ± ± ± ± | ± ± ± ± ± |

F and P by one-way ANOVA test, significant at P = .05. Posthoc test by Duncan’s test.

A higher score for each subscales indicates: greater parental acceptance, greater peer acceptance, less body shape importance, less body shape comparison, higher body shape confidence, lower body shape satisfaction, lower body weight satisfaction, less body weight and shape anxiety and less body weight and shape preoccupation.
3.6 Quality of Life, Self-esteem and Their Association with Body Satisfaction

By partial correlation test controlling for gender and ethnicity, both quality of life and self-esteem had weak significant negative correlation with body satisfaction \( r = -0.107, P = .001 \); \( r = -0.167, P < .001 \), respectively), indicating that those with lower self-esteem and lower quality of life were more likely to be dissatisfied with their body. As shown in Table 6, males and females who were satisfied with current body size had a weak significant difference for quality of life, while males who were unsatisfied with their current body size had a significantly higher level of quality of life compared to females. For self-esteem, there was no significant difference for students who were satisfied with their current body size by gender, but a significant weak association was found for students who were unsatisfied with their current body size by gender (Table 6).

|                        | Satisfied with current body size | Unsatisfied with current body size |
|------------------------|---------------------------------|-----------------------------------|
|                        | Males  | Females | z   | P    | Males  | Females | z   | P    |
| Quality of life        | 2.21 ± | 2.10 ±  | -2.21 | .03  | 2.17 ± | 2.00 ±  | -6.55 | < .001|
| Self esteem            | 2.90 ± | 2.84 ±  | -1.06 | .29  | 2.83 ± | 2.77 ±  | -2.28 | .02  |

\( z \) and \( P \) by Mann-Whitney U test, significant at \( P = .05 \)

4. DISCUSSION

4.1 Body Shape Concerns

Majority of the UTAR and KTAR male and female students were concerned with their body shape. This happens because students progressing from secondary to tertiary study environment will have increased exposure to more surrounding people with different physical appearance and attitudes [12]. Besides, university students are conscious about social figures, celebrities and fashion model and decide whether to use them as benchmarks for choosing their lifestyle or partners [31]. Other than that, body perfectionism is no longer a phenomenon which only involves females, but also males [32].

Most of the students said that the reason they were concerned with their body shape was to be healthy. But female students were concerned with their body shape because they wanted to look good. This is because females place a high importance on appearance at a very young age [33]. Gender differences in body image have been well established by previous studies [12,16,34]. Overweight students were concerned with their body shape as they may have hoped to become healthy, while underweight students were concerned with their body shape as they may have wanted to have a nice appearance.

Although most of the students said they did not have any model for body shape, there were more males who chose sportmen as their model for body shape compared to females while more females chose artistes or models as their model compared to males. This finding is supported by a previous Malaysian study which found that males preferred a strong and muscular body [35]. Besides, the result supports existing literature stating that males spend more time on sport activities and are interested in sports while females spend more time on reading fashion magazines [36]. Other than that, females are the major targets for beauty,
cosmetic and fashion industries [37]. All these will influence who they will chose for their main role models for body shape.

Majority of the university students in this study gained advice for body image from both family members and friends. This finding shows that family members and friends play an important role in the perception of body image. Parents do advise their children to care about their body shape from small to have better future health, self enhancement, social communication and career development [38].

4.2 Body Weight Perception

Majority of males in all BMI categories correctly perceived themselves as underweight, normal or overweight. In contrast, more females misperceived their body weight. This finding is consistent with other studies that showed higher amount of females misperceiving their body weight [39-41]. Females always think that they are not thin enough and they want to lose weight to become slimmer due to continual exposure to the thin figures of models or artistes in fashion magazines [42]. Students with positive physical self-concept feel happy and will always accept their current body whereas students with negative physical self-concept are not happy with their appearance [43]. This causes majority of the normal weight females and some of the underweight females wanted to lose weight and thus, trying to lose weight is almost the norm for females nowadays [44].

Overall, higher amount of both overweight males and overweight females correctly perceived their body weight. Overweight students perceived themselves as fat or very fat and only little amount of them thought they were thin or normal. So, higher amount of overweight students hoped to lose weight and this is supported by a previous finding which found that overweight people were more likely to try lose weight [45].

4.3 Body Shape Perception

The ideal body shape may differ for males and females. At most of the time, males relate to muscular firmness while females associate with thinness [38]. This can be affected by the Western culture which relies on thin females and men with hypertrophied muscles [20,21]. Males want a muscular and fit body because this is associated with physical strength, hardness and power [46]. Besides, females also prefer males with “inverted triangle” body shape which links to physical strength and muscle development in the upper body [46]. Larger body mass is more advantageous for male students who participate in sports such as football [47]. On the contrary, UTAR and KTAR male students selected a figure which is the same as current body shape as their ideal body shape, instead of a muscular or very strong body. For females, they selected a smaller size than their current body shape as ideal and this finding is consistent with previous studies [35,48]. The ideal thin portrayed by magazine or others mass media primarily focuses on females but not on males [49].

Males chose a larger figure for attractive body shape of female compared to females themselves and females also selected a slightly smaller figure for attractive body shape of male compared to male students themselves. They have misperceived the opposite sex’s perception of attractive body image. According to a previous study by Bergstrom et al. [50], females might underestimate male perceptions of attractive female body shape and they think that males prefer a thinner partner. Male subjects in that study had more accurate
perceptions of what females find attractive but there was misperception for opposite sex’s perception of attractive body shape among males and females in this study.

Although most of the students were dissatisfied with their body size but the direction of dissatisfaction with their body was different between gender and this is consistent with previous studies [32,51]. Higher amount of females desired a thinner body than their current body size compared to males and more males desired a bigger body than females [51,52]. Males want a bigger size because they want to be stronger and fitter, to have better body image and perform better in sport activities [9]. For males who were dissatisfied with their current body size, half of them hoped to have a thinner body and half of them desired have a bigger body, the same as observed in a Hong Kong study [52]. A previous study stated that there should be negative body dissatisfaction in the male gender [13]. In contrast to the expected result, both genders in this study had positive body dissatisfaction but the positive value of male gender was near to 0 while female was near to 1. This indicates that there were slightly more males who desired a thinner instead of a bigger body size.

4.4 Attitudes towards Body Image

Influences for males and females to adopt a certain weight come from self, friends, family members and others [33]. Besides, it is a human nature to do comparison with others’ appearance and people who are not attractive fear others would not accept them [53]. Overweight males and females had a lower parental acceptance as observed in a previous Malaysian study [35]. In that study, overweight females had lower peer acceptance but overweight males still had higher peer acceptance. In contrast to the result, both overweight females and males had a lower peer acceptance in this study. Besides, both overweight males and females had lesser body shape confidence and satisfaction. They also expressed significantly greater body weight and shape anxiety compared to underweight and normal weight males. Overweight students had more anxiety towards their body weight and shape because they might have greater body image concerns to change their current body weight and body shape compared to normal and underweight students [54]. People with body image anxiety sometimes will refrain from the public because they fear social evaluation [55]. Khor et al. [35] stated that only overweight female expressed significantly more comparisons of their body shape but both overweight females and overweight males expressed significantly more comparisons in this study. Males compare body shape with best friends, indicating a more competitive relationship [56].

4.5 Quality of Life, Self-esteem and Body Satisfaction

Quality of life and self-esteem had significant negative correlation with body satisfaction. Students in this study with lower self-esteem and lower quality of life were more likely to be dissatisfied with their body. Results in this part were also consistent with existing literature that state females will be more dissatisfied with their body and had lower self-esteem scores [57], but inconsistent with a previous study that found people with high lower quality of life will more likely be satisfied with their body [58].

4.6 Limitations of Study

There were some limitations in this study. First, body weight and body shape were self-reported by students who participated this survey. It will more desirable to measure the actual height and weight of the participants. Some students might overestimate or
underestimate their height and weight because they did not know their actual measurements. This may affect the grouping of BMI categories. But the inaccuracy is decreased in view of the large sample size in this study.

Secondly, BMI was only the indicator of body-fat content. It does not discriminate the ratio between muscle and fat mass. Thus, muscular people might have a high BMI because their weight will increase as the result of increased amount of muscle. There could be some students who were being grouped into the overweight category because of their high content of muscle but not fat, especially among male students.

Thirdly, silhouette chart was used to examine the body image visually. For this, it is also hard to differentiate whether the students regard the body size of this silhouette chart of having excess muscle or fat. Muscular people who have high content of muscle have a bigger size of body shape and they might select a bigger figure equivalent to overweight or obese as their current body size.

Self-reported questionnaires were used to collect the data from the students. There might be sampling bias and students’ response fatigue bias. For sampling bias, data collected sometimes will not be accurate or do not represent the group as error will arise during sample collection. Some students were also more likely to be chosen than others. Questionnaires that require some time to be completed can induce fatigue among participants and may cause them to give inaccurate answers.

### 4.7 Recommendations and Future Studies

A significant proportion of students are not satisfied with their body image, albeit at different ways according to gender, leading to a lower quality of life and self-esteem. Realizing these detrimental effects that a distorted body image could cause, the results of the present study indicate that appropriate intervention measures tailored for separate genders, such as counseling and appropriate health and physical education, should be conducted among the tertiary students in institutes of higher learning. More studies need to be conducted to get a better understanding of gender differences in body image perception among Malaysian university students. Future research is also necessary to examine the parents’ perception and peers’ perception of university students’ body image in Malaysia. A study about how culture affect body image perception of Malaysians should be carried out also as Malaysia has a multi-ethnic and multi-cultural population.

### 5. CONCLUSION

In conclusion, this study found that tertiary students in two institutes of higher learning in northern Malaysia are concerned with their body image, moreover so among females. Socio-cultural factors and psychological factors affected attitudes towards body image among students with different BMI categories in different levels. Therefore, appropriate intervention should be conducted among the tertiary students in institutes of higher learning to counteract the problems involved.

### CONSENT

Not applicable.
ETHICAL APPROVAL

All authors hereby declare that all experiments have been examined and approved by the appropriate ethics committee and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

ACKNOWLEDGEMENTS

The author would like to gratefully acknowledge all the volunteers who have participated in this study. This project was funded by the Department of Biomedical Science, Faculty of Science, Universiti Tunku Abdul Rahman, which had no roles in the study design, collection, analysis and interpretation of data; in the writing of the manuscript.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Gallagher S. Phenomenological and experimental contributions to understanding embodied experience. In: Ziemke T, Zlatev J, Frank RM, editors. Body, language, and mind. Berlin: Walter de Gruyte. 2007;271-6.
2. Grogan S. Body image: Understanding body dissatisfaction in men, women, and children. 2nd ed. New York: Psychology Press; 2008.
3. Shepphird SF. 100 questions & answers about anorexia nervosa. London: Jones and Bartlett Publishers; 2010.
4. Reynaga-Abiko G. Body image. In: Stange MZ, Oyster CL, Sloan JE, editors. Encyclopedia of women in today's world. California: SAGE Publications. 2011;170-4.
5. Gan WY, Nasir MTM, Zalilah MS, Hazizi AS. Direct and indirect effects of sociocultural influences on disordered eating among Malaysian male and female university students. A mediation analysis of psychological distress. Appetite. 2011;56:778-83.
6. Bhuiyan AR, Gustat J, Srinivasan SR, Berenson GS. Differences in body shape representations among young adults from a Biracial (Black-White), semirural community. Am J Epidemiol. 2003;158:792-7.
7. McCabe MP, Ricciardelli LA. The structure of the perceived sociocultural influence on body image and body change questionnaire. Int J Behav Med. 2001;8:19-41.
8. Stice E. Risk and maintenance factors for eating pathology: A meta-analytic review. Psychol Bulletin. 2002;128:825-48.
9. Odea JA, Rawstorne PR. Male adolescents identify their weight gain practices, reasons for desired weight gain, and sources of weight gain information. J Am Diet Assoc. 2001;101:105-7.
10. Sira N, Ballard SM. Gender differences in body satisfaction: An examination of familial and individual level variables. Fam Sci Rev. 2011;16:57-73.
11. Aquilino WS, Supple AJ. Long-term effects of parenting practices during adolescence on well-being outcomes in young adulthood. J Fam Issues. 2001;22:289-308.
12. Gillen MM, Lefkowitz ES. Gender and racial differences in body image development among college students. Body Image. 2012;9:126-30.
13. Khan AN, Khalid S, Khan HI, Mehnaz J. Impact of today's media on university student’s body image in Pakistan: a conservative, developing country’s perspective. Pub Health. 2011;11:379-87.
14. Abraczinskas M, Fisak B, Barnes R. The relation between parental influence, body image, and eating behaviours in nonclinical female sample. Body Image. 2012;9:93-100.
15. Wertheim EH, Martin G, Prior M, Sanson A, Smart D. Parent influences in the transmission of eating and weight related values and behaviors. Eat Disord. 2002;10:321-34.
16. Jones DC, Vigfusdottir TH, Lee Y. Body image and the appearance culture among adolescent girls and boys: An examination of friend conversations peer criticism, appearance magazines, and the internalization of appearance ideals. J Adolesc Res. 2004;19:323-39.
17. Neumark-Sztainer D, Falkner N, Story M, Perry C, Hannan PJ, Mulert S. Weight-teasing among adolescents: correlations with weight status and disordered eating behaviours. Int J Obesity. 2002;26:123-31.
18. Makino M, Tsuboi K, Dennerstein L. Prevalence of eating disorders: a comparison of western and non-western countries. Health Psychol. 2004;7:675-84.
19. Cash TF, Smolak L, editors. Body Image: A handbook of science, practice, and prevention. 2nd ed. New York: Guilford Press; 2011.
20. Allender S, Cowburn G, Foste C. Understanding participation in sport and physical activity among children and adults: A review of qualitative studies. Health Educ Res. 2006;21:826-35.
21. Nicoli MG, Raphael DR. Binge eating disorder and body image perception among university students. Eating Behav. 2011;12:284-88.
22. Thompson SH, Sargent RG, Kemper KA. Black and while adolescent males’ perceptions of ideal body size. Sex Roles. 1996;34:391-406.
23. Sano A, Le DS, Tran MH, Pham HT, Kaneda M, Murai E et al. Study on factors of body images in Japanese and Vietnamese adolescents. J Nutr Sci Vitaminol (Tokyo). 2008;54:169-75.
24. Shih MY, Kubo C. Body shape preference and body satisfaction of Taiwanese and Japanese female college students. Psychi Res. 2005;133:263-71.
25. WHO/IOTF/IASO. The Asia-Pacific perspective: Redefining obesity and its treatment. Hong Kong: World Health Organization, International Obesity Task Force, International Association for the Study of Obesity; 2000.
26. Stunkard AJ, Sorensen T, Schulosinger, F. Use of the Danish Adoption Register for the study of obesity and thinness. In: Seymour SK, Rowland LP, Sidman RL, Matthysse SW, editors. Genetics of neurological and psychiatric disorders. New York: Raven Press. 1983;115-20.
27. Cash TF. Body Image Assessments: MBSRQ. 2002. Accessed 9 January 2013. Available: http://www.body-images.com/assessments/mbsrq.html.
28. Hamilton SR. A relationship between perceived body image and depression: How college women see themselves may affect depression. Stud J Psychol. 2008;1:13-20.
29. Rosenberg M. Society and the adolescent self-image. Princeton: Princeton University Press; 1965.
30. Hoopman R, Terwee C, Aoranson NK. Translated COOP/WONCA charts found appropriate for use among Turkish and Moroccan ethnic minority cancer patients. J Clin Epidemiol. 2008;61:1036-48.
31. Vitolo MR, Bortolini GA, Horta RL. Prevalence of binge eating in female university students in different fields of knowledge (Unpublished doctoral dissertation). Sao Leopoldo, Brazil: University Vale do Rio dos Sinos (UNISINOS); 2005.
32. Furnham A, Badmin N, Sneade I. Body image dissatisfaction: Gender differences in eating attitudes, self-esteem and reasons for exercise. J Psychol. 2002;136:581-96.
33. Malinauskas BM, Raedeke TD, Aeby VG, Smith JL, Dallas MB. Dieting practices, weight perceptions, and body composition: A comparison of normal weight, overweight, and obese college females. Nutri J. 2006;5:11-9.
34. Feingold A, Mazzella R. Gender differences in body image are increasing. Psychol Sci. 1998;9:190-5.
35. Khor GL, Zalilah MS, Phan YY, Ang M, Maznah B, Norimah AK. Perception of body image among Malaysian male and female adolescents. Singapore Med J. 2009;50:303-11.
36. Tiggemann M, Rüütel E. A cross-cultural comparison of body dissatisfaction in Estonian and Australian young adults and its relationship with media exposure. J Cross Cult Psychol. 2001;32:736-42.
37. Riji HM. Beauty or health? A personal view. Mal Fam Physician 2006;1:42-4.
38. Zalilah MS, Anida HA, Merlin A. Parental perception of children's body shapes. Med J Mal 2003;58:743-51.
39. Gowers SG, Green L. Eating disorders: cognitive behaviour therapy with children and young people. London: Routledge; 2009.
40. Inoue M, Toyokawa S, Inoue K, Suyama Y, Miyano Y, Suzuki T, et al. Lifestyle, weight perception and change in body mass index of Japanese workers: MY health up study. Pub Health. 2010;124:530-7.
41. Mikolajczyk R, Maxwell AE, Ansari WE, Stock C, Petkeviciene J, Grima FG. Relationship between perceived body weight and body mass index based on self-reported height and weight among university students: a cross-sectional study in seven European countries. Pub Health. 2010;10:40-51.
42. Kim JH, Lennon SJ. Mass media and self-esteem, body image, and eating disorder tendencies. Cloth Textiles Res J. 2007;25:3-23.
43. Ishak Z, Jamaluddin S, Chew FP. Factors influencing students' self-concept among Malaysian students. World Acad. Sci. Engineer. Tech. 2010;66:800-3.
44. Wardle J, Haase AM, Steptoe A. Body image and weight control in young adults: international comparisons in university students from 22 countries. Int J Obesity. 2006;30:644-51.
45. Staniziano DC, Butler-Ajibade P. Differences in health-related behaviours and body mass index risk categories in African American women in college. J Natl Med Assoc. 2011;103:4-8.
46. Swami V, Tovee MJ. Male physical attractiveness in Britain and Malaysian: A cross-cultural study. Body Image. 2005;2:383-93.
47. Gilliard TS, Lackland DT, Mountford WK, Egan BM. Concordance between self-reported heights, weights and current, ideal body images in young adult African American men and women. Ethn Dis. 2007;17:617-22.
48. Amburgey KR. An exploration of body image perception in an African American population. (Unpublished master thesis). Pittsburgh: University of Pittsburgh; 2009.
49. Chen H, Gao X, Jackson T. Predictive models for understanding body dissatisfaction among young males and females in China. Behav Res Ther. 2007;45:1345-56.
50. Bergstrom RL, Neighbors C, Lewis MA. Do men find "bony" women attractive?: Consequences of misperceiving opposite sex perceptions of attractive body image. Body Image. 2004;1:183-91.
51. Stanford JN, McCabe MP. Body image ideal among males and females: Sociocultural influences and focus on different body parts. J Health Psychol. 2002;7:675-84.
52. Cheung YT, Lee AM, Ho SY, Li TS, Lam TH, Fan YS, et al. Who wants a slimmer body? The relationship between body weight status, education level and body shape dissatisfaction among young adults in Hong Kong. Pub Health. 2011;11:835-6.
53. Rudd NA, Lennon SJ. Body image and appearance-management behaviors in college women. Cloth Textiles Res J. 2000;18:152-62.
54. Annis NM, Cash TF, Hrabosky JI. Body image and psychosocial differences among stable average weight, currently overweight, and formerly overweight women: the role of stigmatizing experiences. Body Image. 2004;1:155-67.
55. Brudzynski L, Ebben WP. Body image as a motivator and barrier to exercise participation. Int J Exerc Sci. 2010;3:14-24.
56. Chock TM. The influence of body mass index, sex, and race on college students’ optimistic bias for lifestyle healthfulness. J Nutr Educ Behav. 2011;43:331-8.
57. Chin YS, Taib MNM, Shariff ZM, Khor GL. Development of multi-dimensional body image scale for Malaysian female adolescents. Nutr Res Pract. 2008;2:85-92.
58. Ansari WE, Clausen SV, Mabhala A, Stock C. How do I look? Body image perceptions among university students from England and Denmark. Int J Environ Res Publ Health. 2010;7:583–9.

© 2013 Wong and Say; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/3.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:
The peer review history for this paper can be accessed here:
http://www.sciencedomain.org/review-history.php?iid=194&id=12&aid=1013