

**EATING BEHAVIOUR,  
BODY IMAGE PERCEPTION AND  
ITS ASSOCIATED FACTORS AMONG PRIMARY  
SCHOOL STUDENTS  
IN KOTA BHARU, KELANTAN**

By

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## ABBREVIATIONS

1. BMI – Body Mass Index
2. kg/m<sup>2</sup> - kilogram/metre<sup>2</sup>
3. AFHC – Adolescent Food Habit Checklist
4. WHO – World Health Organisation
5. NHMS – National Health and Morbidity Survey

## **ABSTRAK**

### **Objektif**

Kebelakangan ini kesedaran tentang persepsi imej tubuh badan semakin meningkat di kalangan kanak-kanak dan remaja. Ketidakpuasan imej tubuh badan sering dikaitkan dengan tingkahlaku pemakanan yang tidak sihat, jantina dan berat badan. Objektif kajian ini adalah untuk mengenalpasti tingkahlaku pemakanan, persepsi imej tubuh badan dan faktor-faktor yang berkaitannya di kalangan pelajar-pelajar sekolah rendah di Kota Bharu, Kelantan.

### **Rekabentuk**

Satu kajian keratan rentas telah dijalankan antara bulan Mac dan April 2015 di tujuh buah sekolah rendah yang telah terpilih secara rawak dari daerah Kota Bharu melibatkan 776 pelajar sekolah dari Darjah Lima dan Enam.

### **Peralatan dan Kaedah**

Kajian ini telah menggunakan soalan kaji selidik yang dijawab sendiri oleh para pelajar yang mengkaji perlakuan pemakanan menggunakan Adolescent Food Habit Checklist (AFHC) dan persepsi imej tubuh badan menggunakan Childress Contour Drawing Rating Scale. Tinggi dan berat badan diukur untuk mengira index jisim badan (BMI). BMI telah dikategorikan sebagai normal, kurang berat badan dan berat badan berlebihan/obese mengikut seperti World Health Organisation (WHO).

## **Keputusan**

Purata umur pelajar di dalam kajian ini adalah 11.2 tahun dengan 57.1% dari mereka adalah perempuan. 51.3% daripada pelajar didapati mempunyai tingkah laku pemakanan kurang sihat dengan purata skor AFHC 13.15 (SD 3.44) manakala 60.1% daripada pelajar tersebut mempunyai ketidakpuasan dengan imej tubuh badan serta jantina dan index jisim tubuh (BMI) didapati adalah faktor paling kukuh mempengaruhi ketidakpuasan ini (nilai  $p < 0.001$ ). Pelajar perempuan didapati mempunyai 2.07 kebarangkalian untuk mendapat ketidakpuasan imej tubuh badan ( $b=0.73$ , Adj. OR=2.07, 95% CI 1.53, 2.81, nilai  $p < 0.001$ ) dibandingkan dengan pelajar lelaki.

Pelajar dengan berat badan berlebihan/obes mempunyai risiko yang lebih tinggi iaitu 4.06 kali kebarangkalian untuk mengalami ketidakpuasan imej tubuh badan ini ( $b=1.40$ , Adj. OR=4.06, 95% CI 2.70, 6.10, nilai  $p < 0.001$ ) berbanding dengan pelajar yang mempunyai BMI yang normal.

## **Kesimpulan**

Kebanyakan pelajar mempunyai ketidakpuasan imej tubuh badan dimana jantina dan BMI adalah faktor-faktor kukuh yang mempengaruhi ketidakpuasan ini. Walaubagaimanapun, kajian ini tidak menemui perkaitan antara tingkahlaku pemakanan dan ketidakpuasan imej tubuh badan.

## **ABSTRACT**

### **Objective**

The awareness of body image perception among children and adolescent had increasing trend in recent years. The dissatisfaction of body image has always been associated with unhealthy eating behaviour, sex and body weight. The objectives of this study were to identify eating behaviour and to identify body image perception and its associated factors among primary school students in Kota Bharu, Kelantan.

### **Design**

This was a cross sectional study conducted from March to April 2015 in seven randomly selected primary schools in Kota Bharu involving 776 students from standard Five and Six.

### **Material and Methods**

This study used a guided self-administered questionnaire which was adapted from Adolescent Food Habit Checklist (AFHC) to assess the eating behaviour and Childress Contour Drawing Rating Scale to evaluate body image perception. Height and body weight were measured to determine the body mass index (BMI). BMI was categorised as normal, underweight and overweight/obese according to the World Health Organisation (WHO).

### **Results**

The mean age of the students was 11.2 year-old with 57.1% of them were females. Among the students, 51.3% had less healthy eating behaviour with mean AFHC score of 13.15 (SD3.44) while 60.1% had body image dissatisfaction with sex and Body Mass Index



(BMI) were found to have significant association ( $p$  value  $< 0.001$ ). Females had 2.07 times the odds to have body image dissatisfaction ( $b=0.73$ , Adj.OR=2.07, 95% CI 1.53, 2.81,  $p$ -value  $<0.001$ ) compared to male when adjusted for other variables. Students who were overweight/obese were at higher risk with 4.06 times the odds of having body image dissatisfaction ( $b=1.40$ , Adj.OR=4.06, 95% CI 2.70, 6.10,  $p$ -value  $<0.001$ ) compared to normal BMI students when adjusted for other variables.

## **Conclusion**

Most of the students have body image dissatisfaction and sex and BMI were the significant associated factors to this body image dissatisfaction. There were no association between eating behaviour and body image dissatisfaction found in this study.

# CHAPTER 1

## INTRODUCTION

### 1.1 Adolescents and its issues

Adolescence is a transition period between childhood and adulthood with changes of specific health and developmental need and rights [1]. Societies do recognize that there is a difference between being a child and becoming an adult. The development include rapid changes in physical appearance or puberty where they tend to become taller, bigger and heavier with appearance of secondary sexual characteristics, neurodevelopmental changes psychological and social changes. However this transition differs between cultures and over time [1].

This period of development generally correspond to the period between the ages of 10 and 19 years suggested by the World Health Organisation's definition of adolescents [1]. In addition, WHO has also divided adolescence into three phases: early adolescence from the age 10 to 14 years old; middle adolescence from age of 14 to 17 years old and late adolescence involved those age of 17 to 19 years old [2]. As known, each of these phases has its own specific characteristic and developmental task.

During early adolescence body image was important to adolescents, their thinking ability started to change and they started to have concrete thinking. Changes in body shape and size can predispose adolescents to develop body image dissatisfaction. Social influence by the peers and media may worsen this body image perception. Female adolescents tend to prefer to thin-idealization more than their male counterparts. They also tend to choose

model or artist as their ideal body desired, and this may lead to unhealthy eating behaviour such as skip meal and unhealthy dieting [3]. On the other hand, male adolescents tend to like more muscular figure as their desired body image and often take sportsman as their idol.

## **1.2 Obesity**

Obesity among adolescent is becoming a global problem and is on the rise. This is important because it may predispose to obesity during adulthood which in itself is related to multiple complications such as metabolic and coronary artery disease. Changes in the diet and sedentary lifestyles due to economic development and urbanization are among the factors which contributed to increasing obesity in the world [4].

The global prevalence of overweight and obesity among children aged from 5 to 9 years old were calculated to be about 10% [5]. More than 41 million children under the age of 5 throughout the world were reported to be overweight or obese in 2014 [5]. The numbers are still rising in the low and middle-income countries, particularly in urban areas. Nearly half of the problematic children live in Asia [5].

In Malaysia, earlier survey NHMS III (2006) estimated that overweight prevalence among children aged 7 to 13 years was 5.9% to 6.8% [6]. A secondary data analysis done from these data showed that prevalence of overweight and obese among primary school children in Malaysia was 19.9% with the higher prevalence among urban residents, males, Chinese, wealthy family and have overweight or educated guardians [6]. The prevalence of obesity among children age below 18 years did not change much after 5 years at 6.1%

(NHMS 2011), but the number had double to 11.9% by 2015 (NHMS 2015) which involved an estimated 1 million adolescents. This showed that our children are still becoming obese despite extensive health promotion being carried out.

## **2. Body image perception**

The development and awareness of body image perception among children and adolescent had been on the rise in recent years particularly in developed country and specifically in developing countries [7]. Body image is defined as a person's perceptions, feelings and thoughts about his or her body size, shape and structure [8]. Body image may be viewed as a main-core of person's perception. It may affect many aspects of human functioning, including thoughts, emotions, behaviours and relationships [9].

Perception of body image can begin as early as 6-year-old [7,10]. A study done involving 1126 school children in North Wales, Australia showed that 6-year-old, particularly among females students have started to show body image and weight concerns and the concerns increase as they grow older [10].

In China, a large study involving 8038 children and adolescent aged 3 to 15 years showed that even children aged 9-year-old can validly self-reported their own body image [7]. They reported that boys over 11-year-old and girls over 9-year-old had already developed body image dissatisfaction [7]. Overall, there were more than half of the children and adolescents who were dissatisfied with their body size [7]. Body image dissatisfaction does continue to increase together as the increase of children's age and their development [11]. Most female and male adolescents reported their greatest dissatisfaction as they

reaching young adulthood [11]. The dissatisfaction of body image had always been correlated with unhealthy eating behavior and later can lead to eating disorder such as bulimia and psychological problems also can arise such as low self-esteem and depression [3]. Body image dissatisfaction may also cause the development of obesity due to its correlation with unhealthy eating behaviour (eg. binge eating and snacking) and inadequate physical activity [12]. This can progress to weight gain over time.

Eating disorder always linked with high levels of body image dissatisfaction and inappropriate weight concerns [3]. These scenarios already are widespread in western societies and occurring particularly among adolescents and young adult [3]. In most societies, overweight and obese adolescents did experience social stigmatism and isolation [13]. This can result in development of their distorted body image problem [13]. A slim and/or muscular body is commonly viewed as the ideal beauty. This standard of beauty perception puts person with excess weight in conflict and makes them vulnerable to develop body image dissatisfaction [3]. It is worth emphasizing that the relationship between obesity and body image dissatisfaction may be bidirectional. Body image dissatisfaction is associated with improper eating behaviour aimed at weight lost, however it may increase sensations of hunger and the risk of compulsive eating, which in turn contributed to overweight [3].

In society where girls who reported being teased by their family members for their weight, they were more likely to involve in unhealthy weight control and eating behaviour, did have higher BMI and higher level of body dissatisfaction compared to those who were not teased [14]. Lack of social support from the society with perceived pressure to be thin

may expose adolescents to further body image dissatisfaction and the cycle of unhealthy eating behaviour will continue predispose the adolescent to eating disorder [12].

## **2.1 Body image and eating behavior**

Studies have found that body image perceptions may affect lifestyle including dietary habits, which in turn, affect food intake and nutritional status. Media always portrayed images of very thin men and women. This causing many adolescents who are normal or healthy do compare themselves to those images and they perceive as being fat and overweight. In their attempt to follow the image perception, they tend to involve in abnormal and unhealthy eating patterns such as skipping meal particularly breakfast and would likely eat more at later meal [13]. Pon et al (2004) [13] also found that overweight students practiced irregular meal times such as skipped meal in order to lose weight. However these practices were also found in normal weight students [13].

Minnesota's Project EAT involving 4746 adolescents showed that there was increase percentage of adolescents who consumed fast food between 1999 and 2004 (female 15.8% to 27.3% and males 16.8% to 30.2%) [15]. It might be due to changes in food environment factors such as limited time for parents to self prepare their family meal. Fast food intake was known had been associated with weight gain and poor nutrition. Therefore interventions are needed to reduce fast food consumption among children and adolescent.

## **2.2 Factors associated with body image perception**

Among the factors which have been identified to be associated with body image perceptions are socioeconomic status [10], weight [16, 13], age [17] and sex [18, 19, 20]. All these factors interact with children's body image and their weight control behaviors [10]. The children from lower socio-economic backgrounds were most at risk of being overweight with prevalence twice compared to the higher socio-economic status peers [10]. On the other hand, few other studies did not show any significant association between socio-demographic and body image perception [21, 22].

Body image dissatisfaction was more prominent among obese children and adolescents. In the study in China, generally, more than half of participants had body image dissatisfaction and it was significantly related to BMI in children above 5-year-old [7]. There was gender difference in ideal body size which consistent for children age 6-year-old with the boys desired a larger body size compared with the same age girls [7].

In Malaysia, a study done among 360 secondary school students aged between 13 and 14 years old in Kuantan by Farah et al [18] found that about 50% of participants had normal body mass index (BMI), 30.3% of them were severely thin and thin and others were overweight and obese. However, 78.1% were dissatisfied with their current body size which mean about half of the students with normal BMI also had body image dissatisfaction despite having a normal BMI [18]. Adolescents with high eating behaviour score using Eating Attitude Test-26 (EAT 26) and high body image discrepancy score were also have greater BMI [18]. Another study among 588 female secondary school students (form 2 and form 4) in Perak by Pon et al [13] showed that through Figure Rating Scale,

95% participants choose the silhouette representing 10% underweight as their ideal or desired body shape. However, the overweight group showed significant greater body image dissatisfaction. It showed overweight girls have higher risk for developing eating disorders [13].

Other factor which might affect body image perception is age as puberty in adolescence is the stage of transition between childhood and adulthood in which changes occur in the physiological and biochemical systems and in behaviour [2]. A cross sectional study done in Jordan involving 326 adolescent schoolgirls, showed the post-menarche girls were at higher risk of developing body image dissatisfaction than pre-menarche [21]. In this study the mean menarche age was  $12.4 \pm 1.1$  years. This age of menarche may vary according to society. In Malaysia, a study among university students showed that age of menarche was around 12 years but 3.8% of the students attended menarche at about 9 to 10 years old [23]. The earlier the menarche age, the earlier the body image dissatisfaction might develop as menarche will bring changes to weight and body shape in females.

Few studies showed that body image dissatisfaction and BMI might predispose to unhealthy outcome during current or later in life. A Dutch study involving more than 7000 students aged 11 to 16 years reported that BMI and body image perception were related with internalizing behaviour such as anxiety and externalizing behaviour problem such as aggressiveness [24]. It also showed that boys may compare to the ideal of lean and muscular body image, thus causing the anxiety of being either too skinny or too fat even when their weight were in normal range. Girls may also have ideas of thinness, causing fear to irreversible fatness even when they had normal BMI. In addition, being overweight or obese is also related to low self-esteem in individual [24].



Parents play a very important role and can be considered as main targets for identification, and be a gender-role models during adolescence and young adulthood, particularly with regards to attitude toward body image and eating. Socio-cultural pressures that agreeable to the thin-ideal that are spreading in western societies are considered to bring a strong impact on body image, especially among adolescents who are particularly influenced by this [25].

## **JUSTIFICATION**

The increasing trend of obesity and body image dissatisfaction had been showed in studies including among children and its potential long term outcome later in life had also been demonstrated. This problem calls for earlier intervention to be introduced to our young generation. These young adolescents need to be educated regarding healthy diet and correct body image perception and in relation of body image dissatisfaction which might affect eating behaviour causing eating disorder.

Environment plays an important influence on the attitude and perception of people, more so in adolescent. Therefore we need our own local study to assess degree of body image dissatisfaction among our young adolescent, and identify the associated factors that might contribute to these. So far, published studies in Malaysia had only investigated the effect of body image in secondary school students such as low self-esteem and unhealthy eating behaviour. However, in the light of the fact that younger children had also developed the body image, it is impertinent that we study our own younger adolescents and assess their body image perception. In this study we will determine the eating behaviour among primary school students and assess how they perceived their body image and to identify the factors which influence their perceptions.

Finding from this study may be used to identify effective intervention through academic and school programs which need to start early to prevent increasing prevalence in obesity and eating behaviour among adolescents.

Primary Care Physician play an important role in early detection and management of individuals at risk of developing unhealthy or dissatisfaction with their body image and

eating disorders especially those with normal BMI which include providing education, incorporate counseling and support services. Research has shown that early identification and treatment can reduce risk of progression of mental health problems specifically eating disorder. Thus, screening adolescents to identify those at risk for developing eating disorder such as body image dissatisfaction, unhealthy eating behaviour and weight control is an important goal for preventive measure of obesity and eating disorder [26].

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## **CHAPTER 2**

### **OBJECTIVES**

#### **1. General objective**

To identify the eating behaviour, body image perception and its associated factor among primary school students in Kota Bharu, Kelantan.

#### **2. Specific objectives**

1. To determine eating behaviour among primary school students in Kota Bharu.
2. To determine the proportion of students with body image dissatisfaction among primary school students in Kota Bharu.
3. To determine factors associated with body image perception among primary school students in Kota Bharu (socioeconomic status, age, BMI, eating behaviour, sex and academic performance).

### **HYPOTHESES**

Socio-demographic factors (age, parental educations and income), BMI, sex and eating behaviour are significant associated factors for body image perception among primary school students in Kota Bharu.



## CHAPTER 3

### MANUSCRIPT

**Article title: BODY IMAGE PERCEPTION AND ITS DETERMINANTS AMONG PRIMARY SCHOOL STUDENTS IN KOTA BHARU, KELANTAN.**

**Running head: Body image dissatisfaction among adolescents in Kota Bharu**

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### **Paper presentation**

The preliminary result of this study had been presented in poster at 19<sup>th</sup> Family Medicine Scientific Conference 2016.

## **ABSTRACT**

**Objective:** Awareness of body image perception among children and adolescent had been increasing in recent years. The objectives of this study were to identify body image perception and its associated factors among primary school students in Kota Bharu, Kelantan.

**Design:** This was a cross sectional study conducted from March to April 2015 in 7 randomly selected primary schools involving students from standard 5 and 6.

**Material and Methods:** This study involved 776 primary school students. A guided self-administered questionnaire which included socio-demographic data, body mass index (BMI) parameters, and body image perception (Childress Contour Drawing Rating Scale) was used.

**Results:** About 60.1% of students had body image dissatisfaction and was significantly ( $p$  value  $< 0.001$ ) associated with sex and Body Mass Index (BMI). Females had 2.07 times the odds of having body image dissatisfaction ( $b=0.73$ , Adj. OR=2.07, 95% CI 1.53, 2.81,  $p$ -value  $<0.001$ ) compared to males when adjusted for other variables. Overweight / obese students had 4.06 times the odds of having body image dissatisfaction ( $b=1.40$ , Adj. OR=4.06, 95%CI 2.70, 6.10,  $p$ -value  $<0.001$ ) compared to normal BMI students when adjusted for other variables.

**Conclusion:** In conclusion, many primary school students have body image dissatisfaction and it is associated with sex and BMI.

**Key words:** body image perception, student, body image

## 1. INTRODUCTION

The awareness of body image had been increasing in trend among children and adolescent. Studies showed that perception of body image can begin as early as 6-year-old [1,2]. Body image is defined as a person's perceptions, thoughts and feelings about his or her body size, shape and structure [3]. Body image is important and may affect human's action and purpose, including emotions, thinking, behaviours and relationships [4].

Body image dissatisfaction continues together to increase with the age and development, with the greatest dissatisfaction when people reach young adulthood [5]. Media always portrayed images of very thin men and women. This causing many adolescents who are normal or healthy do compare themselves to those images and they perceive as being fat and overweight. A slim and/or muscular body viewed as the ideal beauty puts individual vulnerable to develop body image dissatisfaction [6]. Body image dissatisfaction may lead to the development of obesity due to its correlation with unhealthy eating behaviour such as binge eating with reduce levels and duration of physical activity and this can progress to weight gain over time [7]. More overweight students practised unhealthy eating such as skipped meal and irregular meal times in order to lose their weight [8].

In most societies, overweight and obese adolescents did experience social stigmatism and isolation [8]. This can resulted in development of their distorted body image problem [8]. In society where girls who reported being teases for their weight by their family members had higher body mass index (BMI), greater body image dissatisfaction and were more likely to be involved in inappropriate weight control and unhealthy eating behaviour compared to those who were not being teased [9].

Studies showed that body image perception do develop at younger age group. A study involving 1126 students in North Wales, Australia showed that body image perception and weight concerns already presence in children by the age of 6-year-old, particularly among females and the concerns were higher in adolescent group [2]. In China, large study involving 8038 participants aged 3 to 15 years also showed that self-reported body image can be validly determined in children age 6-year-old with girls over 9-year-old and boys over 11-year-old had already developed body image dissatisfaction [1]. Generally, there was only 40.1% participants were feeling satisfied with their current body size [1].

In our local data, a study among 360 secondary school students aged between 13 and 14 year-old in Kuantan by Farah et al [10] showed that though 50% students had normal BMI, 78.1% were dissatisfied with their current body size. Adolescents with high body image discrepancy scores were reported of more likely to have greater BMI [10]. Another local study among 588 Form 2 and Form 4 female students showed that through Figure Rating Scale, 95% participants chose the silhouette representing 10% underweight as their ideal or desired body image [8]. The overweight group showed significant greater body image dissatisfaction [8].

Several factors have been identified to be associated with body image perception. These include socioeconomic status, weight, age, sex and weight control behaviour and advice that they received from family members and peers [2]. Socio-cultural pressures that agreeable to the thin-ideal are considered to bring a strong effect on body image, especially among adolescents [11]. The lower socio-economic backgrounds children most at risk of overweight with the prevalence double that of their higher socio-economic status peers [2].

Body image dissatisfaction and BMI might predispose to unhealthy outcome during current or later in life. A Dutch study involving more than 7000 students aged 11 to 16 years old reported that BMI and body image perception were related with internalizing behaviour such as anxiety, as well as externalizing behaviour problem such as aggressiveness [12]. In addition, being overweight was also linked to low self-esteem in individual [12]. Body dissatisfaction was the strongest predictor and risk for the onset of any eating disorder with more than 20% of adolescent girls of extreme body dissatisfaction did showed onset of eating disorder compared to only 6% of those with less body dissatisfaction [13].

Though the prevalence of eating disorder in Malaysia was rare, however early intervention should be taken among primary school students as few studies showed some secondary school students had already developed syndrome of eating disorder such as skipping meal, binge eating and dieting [8].

This study aimed to determine the body image perception and its determinants among primary school children in Kota Bharu, Kelantan. We hypothesized that there is a high proportion of body image dissatisfaction among the students. Factors that are associated with the body image dissatisfaction might predispose the adolescents with multiple problems later in life. Thus this study will be useful to underline the important factors that we want to look for to prevent this from occurring. In future, intervention may be incorporated in the school syllabus if needed, so adolescents would be aware of what is healthy body image and will not have misconception and be easily influenced by the fad of having a thin body as being the best body size.

## **2. MATERIALS AND METHODS**

### ***Design and Sampling Method***

This cross sectional study was conducted from March to April 2015. Multistage cluster sampling involving students from 2 selected classes each of standard 5 and 6 from 7 randomly selected primary schools in Kota Bharu, Kelantan. From each selected schools, 2 classes from each standard 5 and 6 were randomly selected given a total of 4 classes in each school. All students in selected classes who fulfilled the inclusion and exclusion criteria (parental consent, attended school during data collection and able to read) were included.

### ***Sample size determination***

The sample size for the study was calculated using single proportion formula and the maximum sample size needed was 310. However, after inclusion of 20% non-response and cluster sampling design effect, the final sample size needed was 776.

### ***Study instruments***

The self-administered questionnaire was divided into 3 sections. The first section consisted of measurement of weight and height of the participants. SECA digital weighing scale and body-meter was used for this purpose and each measurement was obtained twice and recorded to the nearest weight 0.1kg and height 0.1cm. Average measurement was documented on the questionnaire. Body mass index (BMI) was calculated and categorized according to BMI-for-age reference (WHO 2007) during data entry. Underweight was defined as BMI-for-age less than 5<sup>th</sup> percentile, normal weight was BMI-for-age between

5<sup>th</sup> to 85<sup>th</sup> percentile and overweight/obese was defined as BMI-for-age more than 85<sup>th</sup> percentile.

The second section was on personal background of the students. And the last section was on body image perception using Childress Contour Drawing Scale (1993) by Childress A.C *et al* [14]. In the scale, each of the eight figures was given a number which represented different degree of body size (from thinnest as in Figure 1 to obese as in Figure 8). The respondents were required to choose a figure that represents their current body size and their perceived ideal body size. A discrepancy score which was a difference between perception of current and ideal body size were calculated. The results with 0 score was classified as satisfied body image and other score as body image dissatisfaction. This scale had been used for pre-adolescent children before specifically for Grade 5 to 8 (corresponding to age 10 to 13 year-old).

An additional section which contained parental education level and income were obtained through the forms given to participants earlier in which needed to be filled up by parents together with given consent.

### ***Data collection***

All students from the randomly selected classes were given sealed envelope containing a copy of the summary of the study, parental consent form and a copy of questionnaire to be given to parents a week prior to data collection day. The students needed to return the filled up consent form and the questionnaire regarding socio-demographic in another supplied envelope to respective class teacher prior to data collection day.



Data collection was conducted on pre-arranged dates agreeable by respective schools. Only consented students were included in the study. Consented students were called to the specific place allocated by the school and briefing regarding the study was given and another written consent was obtained from the participants. The participants were measured for height and weight using SECA body weight and body meter prior to answering the questionnaire. The questionnaire was anonymous and self-administered but guided by the 4 data collectors. Each session was completed within 30 minutes.

### ***Ethical issue***

Ethical approval for this study was obtained from Human Ethics and Research committee USM (USM/JEPeM (14090316)) and permission to conduct the study at the selected primary schools were obtained from Ministry of Education and Kelantan Department of Education. None of the participants were forced to participate in this study and they were reassured that any dissent on their part will not affect them in any way. Students with parental consent were also given their consent through assent form during data collection. However, if very severe body image dissatisfaction were present, the affected students might be referred to respective specialty after discussing with the parents.

### ***Statistical analysis***

Data entry and statistical analysis were done using SPSS software PASW Statistics version 22 (IBM ® SPSS ® statistics 2015). Analysis was started with data exploration to check distribution of data and to check for any potential error in data entry. For descriptive analysis, numerical variables were described in mean and standard deviation (SD) or