EATING PATTERNS AND WEIGHT-RELATED CONCERNS AMONG FEMALE ADOLESCENTS IN RURAL SCHOOLS IN KOTA BHARU, KELANTAN

By

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ABSTRAK

Antara beberapa pola pemakanan umum dalam kalangan remaja termasuk tidak makan, pengambilan snek, makan di luar, pengambilan makanan segera dan corak pemakanan tidak konvensional seperti mengamalkan diet vegetarian, diet spesifik untuk penurunan berat badan, dan pengurangan keseluruhan pengambilan makanan. Makan telah menjadi salah satu topik kesihatan yang paling penting kerana kadar insiden gangguan makan yang semakin meningkat dalam kalangan kumpulan penduduk yang berbeza. Oleh itu, kajian keratan rentas ini telah dijalankan dalam kalangan remaja perempuan untuk menyiasat kekerapan pengambilan tiga hidangan utama, mengenalpasti mereka yang berisiko mengalami gangguan makan, meneroka perkaitan antara pola pemakanan, kebimbangan terhadap berat badan, makan bercelaru, dan Indeks Jisim Badan (BMI). Kaedah persampelan secara rawak berkelompok telah digunakan dan 2 buah sekolah telah dipilih daripada jumlah 23 buah sekolah di kawasan luar bandar. Responden telah diberi soal selidik yang dijawab sendiri dan terdapat beberapa bahagian seperti latar belakang sosio-ekonomi, pola pemakanan, kebimbangan berat badan, dan EAT-26. Daripada jumlah 334 responden, 45.2% adalah pelajar Tingkatan 1 dan selebihnya adalah pelajar Tingkatan 4. Lebih ramai responden tingkatan 4 (72.1%) yang tidak mengambil sarapan pagi berbanding dengan responden Tingkatan 1(67.5%) [X^2 (1) = 0.828, p = 0.363]. Terdapat 18.6% daripada jumlah responden yang mempunyai risiko gangguan makan. Kajian ini mendapati bilangan responden Tingkatan 4 (19.1%) yang mempunyai risiko gangguan makan lebih tinggi berbanding responden Tingkatan 1 (17.9%) [X^2 (1) = 0.085, p = 0.771]. Walau bagaimanapun, tiada perkaitan antara makan bercelaru dan tidak mengambil sarapan pagi[X^2 (1) = 0.561, p = 0.454]. Kajian ini menunjukkan terdapat hubungan yang signifikan

antara tidak mengambil sarapan dengan kebimbangan berat badan [X^2 (1) = 4.404, p = 0.036] tetapi tidak ada hubungan yang signifikan antara makan bercelaru dan kebimbangan berat [X^2 (1) = 2.997, p = 0.083]. Satu perkaitan yang positif ditemui antara BMI dan skor EAT-26 (r_s = 0.240, p = 0.001). Kesimpulannya, kelaziman remaja perempuan menghadapi risiko gangguan makan di kawasan luar bandar Kota Bharu adalah setanding dengan kajian tempatan yang lain yang dijalankan di kawasan bandar. Oleh itu, pendidikan tentang pemakanan dan kesedaran awam diperlukan untuk memperbaiki tingkah laku pemakanan remaja perempuan di negara ini.

ABSTRACT

Some of the typical eating patterns among adolescents include meal skipping, snacking, eating away from home, fast food consumption and unconventional dietary patterns like adopting vegetarian diet, specific weight loss diet, and an overall reduction of food intake. Eating has become one of the most important health topics due to the increasing prevalence and incidence rates of eating disorders among different groups of populations. Therefore, this cross-sectional study was conducted among female adolescents to investigate the eating frequency of three main meals, identify those who are at-risk of eating disorders, explore association of eating patterns, weight-related concerns, disordered eating, and Body Mass Index (BMI). Random cluster sampling method was applied and 2 schools had been selected from a total of 23 schools in rural area. Respondents were given self-administered questionnaire consisting socio-economic background, eating patterns, weight concerns, and EAT-26. From a total of 334 respondents, 45.2% was in Form 1 and the remaining was in Form 4. A higher proportion of form 4 respondents (72.1%) skipped breakfast as compared to form 1 respondents (67.5%) [X^2 (1) = 0.828, p = 0.363]. There was 18.6% of the total respondents at-risk of eating disorders. This study found more Form 4 respondents (19.1%) at-risk of eating disorders compared to Form 1 respondents (17.9%) [X^2 (1) = 0.085, p = 0.771]. However, no association found between disordered eating and breakfast skipping [X^2 (1) = 0.561, p = 0.454]. There is significant association between breakfast skipping and weight concern in this study [X^2 (1) = 4.404, p = 0.036] but there is no significant association between disordered eating and weight concern in this study [X^2 (1) = 2.997, p = 0.083]. A positive correlation was found between BMI and EAT-26 score (r_s = 0.240, p = 0.001). In conclusion, the prevalence of

female adolescents at-risk of having eating disorders in rural area of Kota Bharu is comparable to other local studies in urban areas. Thus, nutritional education and public awareness are needed to improve eating behavior of female adolescents in this country.

CHAPTER 1

INTRODUCTION

1.1 Study Background

Unhealthy weight control behaviors are prevalent among youth. In Project EAT (Eating Among Teens), a large population-based study of 4,746 adolescents, the research team found that more than one half of teenage girls and nearly one third of teenage boys use unhealthy weight control behaviors such as skipping meals, fasting, smoking cigarettes, vomiting, and taking laxatives (Neumark-Sztainer *et al.*, 2002). In the same study, one half of teenage girls and one fourth of teenage boys expressed dissatisfaction with their bodies (Neumark-Sztainer *et al.*, 2002).

The term 'eating patterns' refers broadly to occasions of eating and the context of eating occasions (NSW Schools Physical Activity and Nutrition Survey (SPANS), 2004). Meanwhile, few studies have determined that some of the typical eating pattern among adolescents are such as eating frequency, meal skipping, snacking, eating away from home, fast food consumption and unconventional dietary patterns like adopting vegetarian diet, specific weight loss diet, and an overall reduction of food intake (Moy *et al.*, 2006; Savige *et al.*, 2007; Shi *et al.*, 2005; WHO, 2005).

A limited number of observational studies examining breakfast habits in relation to body weight in children and adolescents have been conducted. Many cross-sectional studies, but not all, document an inverse association between breakfast frequency and relative body weight. Weight-related concerns and perceptions are likely related to breakfast intake and may play a role in the frequency of breakfast consumption (Maureen *et al.*, 2008). In a study conducted

by Maureen and colleagues (2008), they found that both cross-sectional and prospective analyses showed dieting and weight-control behaviors were inversely associated with frequency of breakfast consumption, suggesting that adolescents may resort to unhealthy eating habits such as skipping breakfast as an effort to control body weight.

Previous publications from Project EAT have examined weight-related concerns and disordered eating behaviors among the population (Neumark-Sztainer *et al.*, 2002 and Ackard *et al.*, 2003). Unhealthy weight control behaviors such as skipping meals were present in 57% of adolescent females and 33% of males (Neumark-Sztainer *et al.*, 2002). Furthermore, a direct association was observed between weight status and most of the weight-related behaviors, with greater risk observed in the overweight adolescents. This suggests that adolescent boys and girls may use unhealthy weight-control behaviors, in an attempt to control their weight, that place them at increased risk for weight gain. In a study by Maureen (2008), they found that weight-related concerns and behaviors, and social pressures may partly explain the prospective association between breakfast intake and body weight change, an observation consistent with the hypothesis that many youth, especially girls, may skip meals in a vain attempt to lose weight.

Eating has become one of the most important health topics due to the increasing prevalence and incidence rates of eating disorders among different groups of populations (Buyukgoze-Kavas, 2007). It is found that more than 90% of the eating disorder cases have occurred in individuals aged 25 or below (Sanlier, Yabanci and Alyakut, 2008). It has been suggested that females are at greater risk for eating disorders than males (Tata, Fox, and Cooper, 2000).

Adolescence is an unique creatures characterized by rapid growth and maturation. Besides, adolescence is a vital period in life and implies multiple physchological and physiological changes that affect habits and nutritional needs (Forsen *et al.*, 2004). It is also one of the greatest periods of change throughout the lifespan with changes in body shape (Spear and Kulbok, 2001). Healthful eating aids the youth to promote their health and well-being, helps in achieving their full health potential, and reduces their risks of chronic diseases in adulthood (Shannon *et al.*, 2002). This is because food choice patterns established during youth will likely influence the long-term behaviors (Kelder *et al.*, 1994).

Eating disorders are especially prevalent during adolescence and early adulthood (O'Dea, 2004). Most eating disorders emerge during the period of adolescence which is a vulnerable period of brain reorganization. Thus, malnutrition during this vital period could promote illness or diseases later in life (Treasure *et al.*, 2010). Eating disorders are prevalent and involve serious problem namely anorexia nervosa, bulimia nervosa, and their subclinical variants (Todd Jackson *et al.*, 2008). Futhermore, eating disorders usually emerge during adolescence due to the physical changes of especially females who experienced body fat gain (Abraham and O'Dea, 2001).

Few studies have found that there is significantly high level of dissatisfaction with bodyweight among adolescents. For example, in a population-based study of Japanese pre-adolescents, 60.6% of girls aged between 12-13 years old were dissatisfied with their own bodyweight (Suka *et al.*, 2006). In addition, in a study by Kim and Yoon (2008), they found that 72% of normal weight Korean adolescent were not satisfied with their current weight and wanted to lose weight.

Based on a study conducted by Ricciardelli *et al.* (2004), there are three sociocultural factors that influence the body image, weight change bahaviour and disordered eating. Their study was focusing on evaluating the social component of the biopsychosocial framework to explain health risk behaviors to achieve the ideal body endorsed by society. This framework proposes that body image, disordered eating, strategies to increase muscles, as well as extreme weight change behaviors are shaped by biological, psychological and social factors. The biological factors include body mass index and pubertal timing. Meanwhile, psychological factors include self-esteem, and social factors include perceived pressures from parents, peers and the media to alter body weight and shape (Ricciardelli and McCabe, 2004).

Recent reports have shown that there is an increase in body dissatisfaction and disordered eating in non-Western countries such as Japan (Pike and Borovoy, 2004), Malaysia (Mellor *et.al*, 2009), China (Chan and Owens, 2005; Chen & Jackson, 2008; Ma, 2007) and Fiji (Ricciardelli *et al.*, 2007). Among all the children that were classified as healthy weight, only 46.5% of boys and 43.0% of girls were satisfied with their bodies, and preferences for thinner bodies increased with age (Li *et al.*, 2005).

Body weight dissatisfaction will lead to the development of eating disorders. Thus, this study is important to measure the eating patterns of the female adolescent. Researcher measured the eating frequency of three main meals of female adolescent, examined the proportion of female adolescents at risk of disordered eating, explored the association of eating patterns and weight-related concerns, and explored the association of disordered eating and weight-related concerns.

1.2 Rationale

Young adolescent aged 13 and 16 years old are chosen because they have a higher tendency to be influenced by environmental factors which might contribute to an unhealthy lifestyle (Kennedy and Prothrow-Stith, 1997). Female adolescent is chosen because they are more weight conscious than male. For example, they are more likely to be dieting to loss weight as found by Beardsworth *et al.* (2002). Futhermore, in a study conducted by Myriam Vervaet *et al.* (1998), it shows that girls were more commonly reported with problems related to eating and body weight such as the occurrence of restrained eating with counting of calories and abuse of laxatives as compared with boys.

Few school based studies also have shown that females were more concerned about their weight than males. Danielsson (1998) found that about 40–50% of 13 to 14 years old females in Sweden considered themselves too fat whereas the numbers for males were 20–25%. Meanwhile, Edlund *et al.* (1994) found that about 50% of the 14 years old females in Sweden had practiced dieting during their lifetime. Thus, weight concerns and weight problems among adolescents are more common in females.

Moreover, girls are more likely than boys to perceive themselves as too heavy for their height, with the gender discrepancy being greatest among those within a normal weight range (Emslie *et al.*, 2001). The physical changes of puberty are differentiated by gender with the males experiencing increased skeletal and muscle mass while for females, a gain in fat. This life of stage has been seen as key for the development of female body dissatisfaction and associated problems such as lowered self esteem and eating disorders (Williams *et al.*, 2000).

Since the 1980s, an increasing prevalence of eating disorders has been observed not only in the Western but also in Asian population. For example, a study by Ho *et al.* (2006) found that the prevalence of young females at-risk of developing eating disorders is 7.4%. Whereas, in Taiwan 10.4% of the respondents were found to have disturbed eating attitudes and behaviors measured by EAT-26 (Tsai *et al.*, 2011). In Malaysia, Farah *et al.* (2011) has conducted a study among young adolescents in Kuantan, Pahang and they found that 27.8% of the respondents being at-risk for eating disorders.

This study was conducted in only in rural area because they were little published data about eating disorders among adolescents in rural area in Malaysia. A study by Lee *et al.* (2008), found that one of the risk factors of eating disorders were those living in urban area. For example, Barriguete-Melendez *et al.* (2009), shows that those live in large cities showed higher risk for having an abnormal eating behavior compared to those living in other settings such as the rural areas. It is believed that adolescents who lived in urban area are more health conscious compared to those living in rural area. Latzer *et al.* (2007), states that Christian Arabs who lives in urban area are closer to Western norms and values, more educated, and experiencing a faster rate of change toward modernization than their Moslem and Druze population who live in the rural areas and maintain traditional ways of life. Thus, additional research is needed to explain how weight-related norms differ by geographic residence.

Besides, this study need to be carried out because eating disorders could develop in the adolescence and non-communicable diseases might also develop later in life during adulthood as a consequence of unhealthy eating patterns during adolescence. According to Stice (2002), dieting and other compensatory behaviour

might help to circumvent critism and lessen body weight satisfaction. Thus, these might contribute to the development of eating disorders. Hence, there is a clear need to identify the eating patterns and weight-related concerns among the female adolescents so that prevention and intervention can be fostered to avoid the occurrence of eating disorders. It is also important to increase awareness among the female adolescents regarding the risk of getting eating disorders.

1.3 Objectives

1.3.1 General objective

- To investigate eating patterns among female adolescents in Kota Bharu, Kelantan

1.3.2 Specific objectives

- To measure the eating frequency of three main meals of female adolescent
- To examine the prevalence of female adolescents at risk of eating disorders
- To explore the association of eating patterns and weight-related concerns
- To explore the association of disordered eating and weight-related concerns

1.4 Hypothesis

1.4.1 Hypothesis 1:

H_{O1}: There is no significant association between eating patterns and weight-related concerns

H_{A1}: There is significant association between eating patterns and weight-related concerns

1.4.2 Hypothesis 2:

H_{O2}: There is no significant association between disordered eating and weight-related concerns

H_{A2}: There is significant association between disordered eating and weight-related concerns

1.5 Definitions of Terms

1.5.1 Adolescence

Based on World Health Organization (WHO, 2013), adolescents are young people between the ages of 10 and 19 years. United Nations Children's Fund (UNICEF, 2011), also defines adolescence within the age of 10-19 years with early adolescence (10–14 years) and late adolescence (15–19 years).

1.5.2 Body Mass Index (BMI)

Body Mass Index (BMI) is a simple index of weight-for-height that is commonly used to classify underweight, overweight and obesity in adults. It is defined as the weight in kilograms divided by the square of the height in metres (kg/m^2) (WHO, 2006).

1.5.3 Eating patterns

Eating patterns are defined as the number of intake occasions and the temporal distribution of these occasions across the day (Ma *et al.*, 2003).

1.5.4 Disordered eating

Disordered eating (DE) includes the full spectrum of eating-related problems from simple dieting to clinical eating disorders such as anorexia nervosa and bulimia

nervosa (American Psychiatric Association, 2007). Disordered eating behaviour could also be defined as troublesome eating behaviors such as purgative practices, bingeing, food restriction, and other inadequate methods to lose or control weight, which occur less frequently or are less severe than those required to meet the full criteria for the diagnosis of an Eating Disorder (Raquel *et al.*, 2007).

1.6 Conceptual Framework

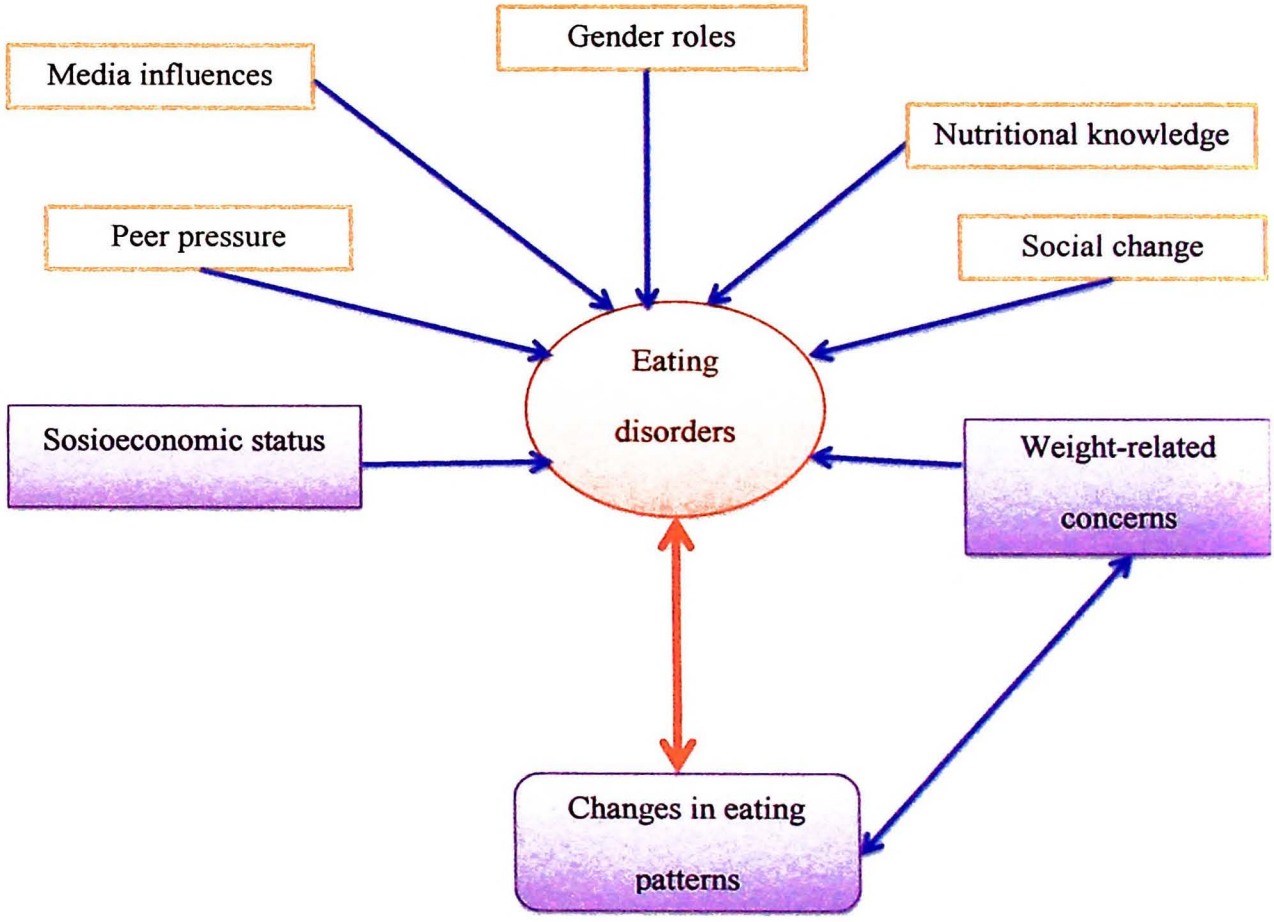

***Figure 1.1*: Conceptual framework of factors predisposing to eating disorders** (Adapted from Nasser, Katzman, and Gordon, 2001; Chisuwa and O'Dea, 2010)

This is the conceptual framework for this study. It is used to investigate the association between eating patterns, weight-related concerns, and eating disorders.

There are few factors contributing to the development of eating disorders. As such, weight-related concerns such as dissatisfaction with body weight leads to chronic dieting and eventually to full-blown eating disorders (Pon *et al.*, 2004).

Besides, receiving negative comments from peers or friends regarding body weight have significantly increased the probability of developing eating disorders. Few studies have shown that there was a relationship between mass media and eating disorders occurrence. Female adolescents aged 9-14 years, who made efforts to look like females in media have been 1.9 and 1.6 folds more likely to have weight concerns and to become constant dieters, respectively (Mousa *et al.*, 2010).

The gender expectations of the female role is recognised as an influential factor in the desire for the slim ideal and the subsequent body image concerns and resultant eating problems amongst Japanese women. It shows that eating disorders in the female population was predominance when compared to rates amongst male (Chisuwa *et al.*, 2010). Other factors such as sosioeconomic factors, nutritional knowledge, social change, and changes in eating patterns are also believed to be the factors predisposing to eating disorders. However, in this study, we only investigated few factors such as socioeconomic status, changes in eating patterns, and weight-related concerns. We also investigated the association between eating patterns, weight-related concerns, and eating disorders.

CHAPTER 2

LITERATURE REVIEW

2.1 Adolescence

Based on World Health Organization (WHO), (2013), adolescents are young people between the ages of 10 and 19 years. United Nations Children's Fund (UNICEF), (2011), also defines adolescence within the age of 10-19 years with early adolescence 10 to 14 years and late adolescence 15 to 19 years. Adolesence is a transitional period between chilhood and adulthood, which begins from the earliest signs of the development of secondary sexual characteristics and ends when a person has achieved adult status (WHO, 1995).

Adolescents is the stage where they may be at higher risk to establish many undesirable lifestyle habits such as physical inactivity, poor eating habits, and misperception of their body image (Kennedy and Prothrow-Stith, 1997). Adolescents normally achieved up to 50% of their adult weight, 20% of adult height, and 50% of adult skeletal mass during their adolescents phase. However, there are sex differentials in acceleration of growth and maturation during this time. These include earlier onset of puberty and higher fat mass in females but higher fat-free mass, peak height velocity, and increase in shoulder span in males (Vizmanos and Marti-Henneberg, 2000). Hence, normal development and growth of adolescents are vital in order to prevent many health problems later in adulthood (Farah *et al.*, 2011).

2.2 Eating patterns among adolescents

Typical eating patterns among adolescents are such as meal skipping, eating away from home, snacking, consumption of fast food for meal and alternative dietary patterns like adopting specific weight loss diet, vegetarian diet, and an overall reduction of food intake (Savige *et al.*, 2007; Shi *et al.*, 2005; WHO, 2005). In a study conducted by Chin and colleagues (2009), it shows that meal skipping behaviour were common among Malaysian female adolescents. Moreover, meals skipping have been reported as one of the most common weight-control practices (Felts *et al.*, 1996).

Malaysians are increasingly engaging in obesogenic behaviors, such as diets that are high in fat and calories, while simultaneously leading sedentary lives (Tee, 1999), and body dissatisfaction is increasing. In a study by Pon *et al.* (2004) found that while 74% of the overweight students in a sample of 588 female secondary school students perceived themselves to be overweight, so too did 50% of the normal weight participants. Almost all (98%) of the students in the overweight category expressed an earnest desire to reduce their weight, as did 74% of the normal weight participants. Similar observations were reported by Leong, Poh, and Ng (2004) in a study of 523 adolescent girls in Kuala Lumpur. In explaining these findings, Pon *et al.* (2004) argued that many normal, healthy adolescents compare themselves with images of very thin men and women portrayed in the media and then come to view themselves as being fat. In their endeavour to emulate these media images, they resort to disrupted and abnormal patterns of eating, such as skipping meals and yo-yo dieting.

There were few studies shown that meal skipping behaviour are prevalent among Malaysian female adolescent (Shi *et al.*, 2005; Moy *et al.*, 2006; Sjoberg *et*

al., 2003; SerraMajem *et al.*, 2001; Chin *et al.*, 2009). In a study conducted by Chin (2009), it shows that two in three of the participants involved in the study skipped at least one meal per day and breakfast was the most frequently skipped meal (47.4%) among the three main meals. Likewise, a study conducted by Rasyedah *et al.* (2003), also reported high rates of meal skipping behaviour among adolescents, particularly breakfast skipping as the main missed meal with 79%, followed by lunch with 67%, and lastly dinner with the least missed meal with 52%. The meal skipping practices has been identified as one of the mean of weight control behaviour (Shisslak *et al.*, 1999).

2.3 Weight concern among female adolescents

Few school based studies have shown that females were more concerned about their weight than males. Danielsson (1998) found that about 40–50% of 13 to 14 years old females in Sweden considered themselves too fat whereas the numbers for males were 20–25%.

Weight-related problems, including obesity, eating disorders, and disordered eating behaviors such as unhealthy weight-control practices and binge eating, are major public health problems in adolescents given their high prevalence and adverse health consequences (Ogden *et al.*, 2006). Research suggests that these weight-related problems can occur simultaneously, increase in severity over time, and lead to the onset of different weight-related problems (Neumark-Sztainer *et al.*, 2006).

Abnormalities in weight among adolescents are important public health concerns. Perceived overweight and the drive for weight control have often been

characterised as irrational and hazardous, especially for young girls, who are viewed as pursuing absurdly thin ideal weights and risking their mental and also physical health (Hoare *et al.*, 1998). However, when the accuracy of perceptions of overweight is investigated more closely, it appears that the problem is not just that some thin people feel fat, but also that many overweight people are unaware that their body weight is too high (Chang *et al.*, 2003).

2.4 Body weight dissatisfaction

Body dissatisfaction is a fluctuating symptom that may be contingent upon recent changes in shape or weight, current eating patterns, or overall mood such as experiencing shape- or weight related distress when dressing, weighing oneself, or comparing one's body to others' (Cooper *et al.*, 1993). The related constructs of high shape and weight concerns have been identified as risk factors for eating disorders (McKnight *et al.*, 2003) and may be markers for other detrimental health behaviors (Neumark-Sztainer *et al.*, 2005). In a study by Carmen Tam (2007), a high degree of body weight dissatisfaction was shared by the adolescents. It shows that disordered eating (EAT score $\geq$20) was present in 52 (3.9%) adolescent boys and 68 (6.5%) adolescent girls.

Although body dissatisfaction and disordered eating have typically been seen as problems affecting girls living in developed Western countries (Kennedy *et al.*, 2004), Recent reports however, have shown an increase in body dissatisfaction and disordered eating in non-Western countries such as Japan (Pike and Borovoy, 2004); Malaysia (Mellor *et al.*, 2009); China (Chan and Owens, 2005; Chen and Jackson, 2008; Ma, 2007) and Fiji (Ricciardelli *et al.*, 2007). In a large survey

study concerning body satisfaction involving over 9000 Chinese children, Li *et al.* (2005) found that rates of body dissatisfaction were comparable to those reported in Western populations. Among the children classified as healthy weight only 46.5% of boys and 43.0% of girls were satisfied with their bodies, and preferences for thinner bodies increased with age (Li *et al.*, 2005).

In a study by Neumark-Sztainer *et al.*, (2006), they found that in females, lower body satisfaction predicted higher levels of dieting, unhealthy and very unhealthy weight control behaviors and binge eating. High percentages of adolescents, particularly adolescent females, are dissatisfied with their bodies (Neumark-Sztainer *et al.*, 2002). The high prevalence of body dissatisfaction during adolescence, a critical period of identity formation, is disturbing in that body image, self-image, and self-esteem tend to be closely intertwined (Keery *et al.*, 2004).

Longitudinal analyses show that low body satisfaction during early and middle adolescence is predictive of later signs of more global mental distress, including lower self-esteem and depressive symptoms (Johnson *et al.*, 2005). Body dissatisfaction and preoccupation with thinness are strong predictors of eating disorders and related disordered eating behaviors (The McKnight *et al.*, 2003). Thus, there is concern among adolescent health professionals about the high prevalence of adolescents with low levels of body satisfaction (Smolak, 2004).

Body dissatisfaction is a potent risk factor for eating pathology (Jacobi *et al.*, 2004; Stice, 2002; Striegel-Moore and Bulik, 2007) and prospectively predicts worsening disordered eating such as eating disorder attitudes and behaviors. The perception of the social environment may interact with body dissatisfaction such

that those with high body dissatisfaction may have the greatest disordered eating when social norms encourage thinness and disordered eating (Jean Forney *et al.*, 2013).

Body weight dissatisfaction and misperception is very common among adolescent (Conley *et al.*, 2007). In a study by Jaworowska *et al.* (2009), it shows that there was a widespread feeling of body weight dissatisfaction among obese, overweight and normal weight participants. It was also demonstrated that instead of their measured BMI status, higher percentage of female students self-reported themselves as overweight or obese.

Many studies have observed that mostly individuals who attempted dieting are of normal weight for their height (Malinauskas *et al.*, 2006). There is strong association between perceived body weight status and weight control behaviour. In order to start body weight control by the means of healthy eating practices, weight perception is a better predictor than actual weight (Page *et al.*, 2005). However, individuals who having normal weight or underweight but perceived themselves as overweight will engaging in negative eating behaviours such as skipping meals, unnecessary dieting, fasting, using diet pills and laxatives, binge eating, purging or self-induced vomiting (Cheung *et al.*, 2007). In contrast, overweight or obese individuals who perceived themselves as normal weight may not feel the need to diet or exercise to control and manage their body weight (Page *et al.*, 2005).

2.5 Eating Disorders

Eating disorders are psychiatric illnesses marked by disordered eating behavior, disordered eating attitudes, disordered food intake, and often inadequate methods of weight control. Eating disorders consists of anorexia nervosa, bulimia nervosa, and eating disorder not otherwise specific. Anorexia nervosa (AN) is marked by a serious weight loss, refusal to eat, and a disturbance in the way in which one's body weight or shape is experienced. Meanwhile, bulimia nervosa (BN) is marked by presence of binge eating episodes, followed by compensatory behaviors such as vomiting or use of laxatives; self-evaluation is unduly influenced by body shape and weight. Eating disorders not otherwise specified (EDNOS) includes binge eating disorder (BED) and other clinically significant disorders of eating that do not meet all the criteria for clinical AN or BN (American Psychiatric Association, 2007).

Whereas, disordered eating includes the full spectrum of eating-related problems from simple dieting to clinical eating disorder such as anorexia nervosa and bulimia nervosa (American Psychiatric Association, 2007). The development of disordered eating behaviors is explained by biopsychosocial multifactorial models and should be viewed as a multidimensional construct with some core symptom dimensions including body image concern. Although nonnormative eating patterns may not be considered mental disorders, they may be important in terms of their impact on body weight and health (Striegel-Moore *et al.*, 1993).

Most of the studies in the area have shown that disordered eating and disturbed eating attitudes and behaviours occur mainly in western, modern industrial societies (Hay *et al.*, 2008; Hudson *et al.*, 2007). As such, disordered and disturbed eating are considered to be culture-bound syndromes of the West

(Bradford and Petrie, 2008; Jackson and Chen, 2007; Ricciardelli and McCabe, 2004; Stice *et al.*, 1994; Witztum, Stein, and Latzer, 2005), where being thin symbolises social acceptance, beauty, and success.

In contrast, non-western populations, including Arab societies, are found to idealise plumpness, which symbolises beauty, fertility, and good health (Shuriquie, 1999). Nonetheless, eating disorders and disordered eating have recently begun to emerge in non-western countries as well (Cummins, Simmons, and Zane, 2005; Makino, Tsuboi, and Dennerstein, 2004; Mond, Chen, and Kumar, 2010). In Arab and Muslim countries, such as Pakistan, Egypt, Saudi Arabia, Lebanon, the United Arab Emirates, and Iran, these disorders have been documented mainly among females (Afifi-Soweid, Najem Kteily, and Shediac-Rizkallah, 2002; Al-Issa, 1966; Al-Subaie *et al.*, 1996; Al-Subaie, 2000; Choudry and Mumford, 1992; Eapen, Mabrouk, and Bin-Othman, 2006; Elsarrag, 1968; Kiriike and Nagata, 1997; Mumford, Whitehouse, and Choudry, 1992; Nasser, 1986, 1988, 1994; Nobakht and Dezhkam, 2000; Thomas, Khan, and Abdulrahman, 2010).

In the last three decades, large numbers of Israeli-Jewish adolescents in non-clinical settings have been found to have abnormal eating attitudes and weight concerns (Harel *et al.*, 2002; Latzer, 2003; Latzer and Tzischinsky, 2003, 2005). Four studies have examined disordered eating attitudes and behaviours among Israeli-Arab adolescent girls in communal samples. The results revealed similar maladaptive eating behaviours among Arab adolescent females and their Jewish peers (Apter *et al.*, 1994; Latzer, Tzischinsky, and Azaiza, 2007; Latzer, Tzischinsky, and Geraisy, 2007).

2.6 Risk factors of eating disorders

The development of disordered eating attitudes and behaviours is multifactorial which includes socio-cultural and environmental factors such as socio-economic status (SES), ethnicity, parental factors, peer pressure and the cultural ideal of slimness are important contributing factors. Eating disorders were formerly seen as afflictions of the White, middle class in the Western societies. These social and cultural boundaries no longer exist as recent epidemiological studies have shown a parallel rise in the prevalence of disordered eating in the non-Caucasian world including Japan, Korea, Iran and India (Chugh *et al.*, 2001). Weight concerns are also becoming more common among males and are shifting to influence all social classes (McClelland *et al.*, 2001).

There are also other factors that contribute to the eating disorders. Few studies that examined the risk factors of disordered eating among adolecent girls shown that age was the predictor of negative eating behaviour (Eapen *et al.*, 2006). In a study by Mousa *et al.*, (2010), it shows that eating disorders was more prominent among the age categories of 12.1-14 years and 14.6-16 years, that is among participants who were older than 12 years and which is nearest to the mean menarcheal age. Besides, adolescent who received negative comments from their peers or friends regarding their body weight have significantly increased the probability of developing eating disorders (Mousa *et al.*, 2010).

Peer interactions may also extend beyond negative appearance-related feedback and include such factors as appearance-based conversations, popularity among friends based on appearance, and peer modeling of body image and/or weight concerns (Jones, 2004; Paxton, *et al.*, 1999; Thompson *et al.*, 2005). In terms of peer modeling, Eisenberg *et al.* (2005) found that having friends who

were dieting to lose weight was associated with a greater use of unhealthy weight-control behaviors such as using diet pills, purging, and smoking for average weight and moderately overweight girls.

Futhermore, high sosioeconomic status has significantly contributed to the development of eating problems (Ho *et al.*, 2006). On the other hand, several studies have shown that adolescent girls with high socioeconomic status are not at risk of developing eating disorders (Eapen *et al.*, 2006).

It has been suggested that females are at greater risk for eating disorders than males (Tata, Fox, and Cooper, 2000). A substantial body of research has focused on the prevalence of extreme weight loss strategies among adolescent girls (Stice *et al.*,2001) and the sociocultural factors that are associated with these behaviors (Byely *et al.*, 2000). In a study conducted by Ricciardelli *et al.* (2004), they came with a framework proposes that disordered eating, as well as extreme weight change behaviors are shaped by biological, psychological and social factors. The biological factors include body mass index and pubertal timing, psychological factors include positive and negative affect and self-esteem, while social factors include perceived pressures from parents, peers and the media to alter weight. This framework has received support for weight loss among adolescent girls.

Besides, a number of previous longitudinal studies have examined the relationship between sociocultural influences and disordered eating among adolescent girls. For example, Field *et al.* (1999) conducted a 1 year follow-up of 6982 girls aged 6–14 years. The results indicated that importance of thinness to peers and wanting to look like females in the media were predictive of beginning to purge at least monthly. A later study by the same research team (Field *et al.*,

2001) reported on a 1 year follow-up study of 6770 girls and 5287 boys between the ages of 9 and 14 years old. The authors found that those boys and girls who were focused on looking like their same sex role models in the media were more likely to be concerned about their weight.

Pressure to attain the ideal body type has been used to explain the emergence and maintenance of body dissatisfaction among girls and boys. In particular, societal pressures have been reported to explain dissatisfaction with weight, a preoccupation with dieting and an increase in the incidence of eating disorders (Griffiths *et al.*, 2000).

Peers have also been found to transmit sociocultural messages that influence body image perceptions and weight concerns (Dunkley, Wertheim, and Paxton, 2001; McCabe and Ricciardelli, 2004; McCabe, Ricciardelli and Finemore, 2002 ; Taylor *et al.*,1998 ; Vincent and McCabe, 2000 ; Wertheim *et al.*, 1997). Peer discussions and modelling about weight-related issues have been found to further reinforce and perpetuate the importance of the perceived societal ideal among girls (Dunkley *et al.*, 2001; Paxton, 1996) and boys (McCabe and Ricciardelli, 2003).

The source of sociocultural influence most heavily criticised for promoting body dissatisfaction and body change behaviors is Western media, with its relentless portrayal of thin female bodies and emphasis on diet and weight control (Jung and Forbes, 2007). It has been suggested that in non-Western countries, exposure to the Westernised media has leads to the adoption of Western beauty ideals, which in time override traditional or previously held body type ideals (Becker *et al.*, 2002 and Williams *et al.*, 2006). This proposition is supported by

evidence linking exposure to Westernised media with concurrent rises in body dissatisfaction and disordered eating in non-Western countries (Becker *et al.*, 2002; Mellor *et al.*, 2009; Shih and Kubo, 2002).

Morrison, Kalin, and Morrison (2004) also found that social comparison was the best predictor of body dissatisfaction, appearance self esteem, and engagement in body change behaviors, with universalistic sources of influence such as media, exerting greater influence than particularistic ones like friends and family.

In addition, few studies had also shown that media influences contributed to the development of eating disorders. Adolescent girls who made efforts to look like females in media have been more likely to have weight concerns and become a constant dieter (Field *et al.*, 2001). Studies have generally come to a conclusion that the media transmits messages resulting in high levels of body dissatisfaction among adolescent boys and girls (McCabe and Ricciardelli, 2000; Ricciardelli *et al.*, 2000; Thompson and Heinberg, 1999). The general consensus is that the media is an extremely powerful medium that promotes the thin ideal, which, in turn, contributes to body dissatisfaction in females.

2.7 Disordered eating among adolescents

A great deal of recent research has been focused on disordered eating behaviors in children and adolescents. Disordered eating includes a variety of behaviors: unhealthy dieting, such as severe caloric restriction and use of meal supplements; unhealthy eating, such as consumption of large quantities of high fat foods or skipping meals; and anorexic and bulimic behaviors, such as laxative and

diet pill use, cycles of binge eating and dieting, and self-induced vomiting (Neumark-Sztainer, 1996).

In a study of 470 early adolescents aged 11 to 14 in Australia, 13% of boys and 27% of girls reported currently trying to lose weight (O'Dea and Abraham, 2000). In addition, among a sample of 350 Australian aged 12 and 13 years old, in another study by O'Dea and Abraham (1999), 9% of males reported currently dieting to lose weight, as did 24% of females. The incidence of dieting appears to be even higher among older adolescents. For example, Paxton (1993) found that among 130 of 14 years old girls in private Australian schools, 30% reported counting calories at least occasionally and 53% reported eating a low calorie diet at least occasionally. Also, Neumark-Sztainer, Butler, and Palti (1995) found that 55% of 340 participants aged 15 and 16 years old Israeli girls reported dieting in the past 2 months.

Meanwhile, Edlund *et al.* (1994) found that about 50% of the 14 years old females in Sweden had practiced dieting during their lifetime. Thus, weight concerns and weight problems among adolescents are common (Garner *et al.*, 1984) and dieting is one strategy to reach the goal of getting an attractive body and a better self-esteem. Thus, dieting has been implicated as a triggering factor in disordered eating.

Disturbed eating attitudes and dieting behaviours in adolescents are widespread, and adolescents are considered an at-risk group for the development of eating disorders. Late adolescence is characterised by widespread symptoms of disordered eating. About 36.4% of girls and 23.9% of boys place a great importance of weight and shape on self-evaluation, and about 41.5% of girls and

24.4% of boys' present body image disturbance (Ackard, Fulkerson, and Neumark-Sztainer, 2007). Disordered eating and disturbed eating attitudes and behaviours are well-documented problems, in particular among adolescent females (Levine and Smolak, 2006; Striegel-Moore *et al.*, 2009). This transition is explained by the desired 'slenderness culture'; that is, the idealised images of beauty and attractiveness that pervade modern society and affect the eating behaviour of both female and male adolescents (Tantleff-Dunn *et al.*, 2011).

The popularity of unhealthy weight loss practices especially among adolescent girls has become a focus of concern among health professionals in recent years. In Western literature, disordered eating is reported to affect 9% to 22% of adolescent girls (Leichner *et al.,* 2002). Chronic dieting and disordered eating behaviours such as purging have been associated with malnutrition, delayed sexual maturation, growth retardation, and mental health symptoms including fatigue, mental sluggishness, anxiety, depression, and an increased risk of developing eating disorders that carry significant morbidity and mortality (Neumark-Sztainer *et al.*, 2004). In light of the potential adverse effects on physical and psychological well-being, the growing prevalence and the decreasing age of onset as suggested by recent studies, disordered eating has become a serious public health issue (Whitaker, 1992).

2.8 Weight control behaviors

Weight control behaviors describes a constellation of practices designed to influence one's shape or weight, which exist on a continuum ranging from healthy to unhealthy. For example, adolescents may use the term "dieting" to refer to